

ORIGINAL ARTICLE

The Relationship Between Teachers' Planning and Content Delivery Using the Five-Stage Lesson Plan Structure: An Analysis of Age, Gender, Experience and Academic Qualifications in Kenya

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ABSTRACT

Effective instruction is vital for quality education in Kenya, with learners' success mainly dependent on structured methods like the five-stage lesson plan (5-SLP). Nonetheless, the effectiveness of instruction may differ depending on the demographic and professional attributes of the teachers. Although the value of planning for content delivery is well acknowledged, there is limited information on how teachers' characteristics (age, gender, experience and academic qualification) influence their planning and content delivery. Thus, this study examined the relationship between teachers' planning and content delivery through the 5SLP, focusing on their characteristics. A sample of 226 CRE teachers was analysed using an observation checklist and a semi-structured questionnaire. The impact of gender, age, experience and academic qualification on teachers' planning and content delivery was investigated in the study using multivariate analysis of variance (MANOVA) and tests of between-subjects effects. Results indicated that age significantly affects both planning and content delivery ($p=0.003$, $p=0.002$, $p=0.000$), while gender, experience and educational qualifications did not show a substantial impact. Nevertheless, significant combined effects were observed between age and gender ($p=0.010$), gender and experience ($p=0.045$), age and experience ($p=0.004$) and age and academic qualification ($p=0.016$). Furthermore, tests of between-subjects effects indicated significant interactions among age, academic qualifications and experience ($p=0.039$, $p=0.016$, $p=0.004$) affecting content delivery. The study findings recommended a policy on the need for customised training programmes that consider these complex interactions to enhance instructional effectiveness. Generally, the study contributes to understanding how demographics influence educational practices, offering valuable insights for improving teacher preparation and professional development.

1 | Introduction

Operative teaching is a complex process that calls for a thorough comprehension of the subject matter and the capacity to organise and present information in a way that encourages and supports learning in students. According to Sims and

Fletcher-Wood (2021), effective teaching is a difficult process that calls for careful preparation and skilful material delivery. To improve educational outcomes, it is vital in academic research to comprehend the elements that influence various components of instruction. Examining the several elements that affect teaching practices is becoming more crucial as educational institutions

work to improve student outcomes and teaching quality (Inda-Caro et al. 2019; Nzomo et al. 2023). Therefore, instructors' planning and content delivery is the main emphasis of this study, which specifically looks at the roles of experience, age, gender and academic credentials within the framework of the 5-SLP structure.

It is impossible to exaggerate how crucial teacher preparation is to the success of both teaching and learning. Instructional practices employed by teachers play a crucial role in shaping student learning outcomes (Nzomo, Rugano, and Njoroge 2023). Teachers can better structure their classes, foresee possible problems and come up with engaging solutions for their learners when they plan (Gurley 2018; Ngichio, Karuku, and King 2020). However, depending on a range of professional and demographic characteristics, the quality of planning and how it is carried out in the classroom might differ greatly. Additionally, Bragg, Walsh, and Heyeres (2021) claim that content delivery is a crucial aspect of education that encompasses the techniques and approaches educators employ to impart knowledge to their students. They argue that delivering content effectively calls for both a thorough mastery of the subject matter and the ability to make it interesting and approachable for students. Experience, educational background and personal traits can all have an impact on how well teachers arrange and deliver curriculum.

In general, the study looks at how teachers' planning and content delivery are impacted by factors such as age, academic background, experience and gender within the structure of the 5-SLP. The 5-SLP structure is a methodical framework for organising and executing successful lesson plans (Saoke et al. 2022, 2023). According to Saoke et al. (2022), every step of 5-SLP structure has a distinct function in keeping students interested, promoting learning and solidifying important ideas. All factors considered, teachers may organise their classes, engage students and foster meaningful learning experiences with the help of the 5-SLP structure. Through the use of phases like the anticipatory set, new content introduction, individual practice and lesson closure, educators can successfully connect unfamiliar concepts to well-known ones, spark students' curiosity and keep their attention throughout the learning process (Fujii 2016). The framework helps educators efficiently introduce new ideas. Furthermore, Saoke et al. (2023) suggested that teachers who utilise this framework can better organise their lessons and engage students, leading to enhanced educational outcomes. The interplay of age, gender, experience and academic qualifications within this framework warrants further exploration to understand how these factors influence teaching effectiveness.

To ensure effective teaching and learning experiences, there is a need to determine the relationship between teachers' planning and content delivery. König et al. (2021) argue that establishing precise instructional goals and learning objectives is essential to effective planning. They add that teachers who carefully organise their lessons link the delivery of the content with these goals. This alignment guarantees that the lesson's content will directly contribute to the achievement of the intended learning objectives. In support of these arguments, White, McGowan, and McDonald (2019) uphold that teachers can present the material in a logical and coherent order with the aid of planning. Teachers can then offer content in an organised fashion that

promotes learning and retention by skilfully structuring the material. Additionally, Akyuz (2023) highlights that the delivery of content should be guided by a well-structured lesson plan, which facilitates student comprehension and follow-through. Through a well-structured lesson plan, teachers can anticipate the different requirements and learning styles of their learners by planning. Research by Gurley (2018) and Bragg, Walsh, and Heyeres (2021) illustrated that teachers can offer content in a way that is both interactive and engaging by using planning. They demonstrated that lesson plans that incorporate activities, discussions, multimedia resources and other interactive tactics help teachers create a dynamic learning environment that encourages participation and engagement from their students. Furthermore, learners' motivation and attention are increased through captivating information delivery. Additionally, Nagro, Fraser, and Hooks (2019) recommended that when instructors are delivering content, formative assessment techniques and feedback channels must be taken into account. Teachers can monitor learners' understanding, give timely feedback and modify their delivery based on student responses by integrating assessment opportunities into the lesson plan. Delivering content more effectively is made possible by this continual process of evaluation and feedback.

A wide range of elements, such as professional qualifications and demographics, impact the effectiveness of teaching. This study examines the literature on the effects of age, gender, experience and educational background on lesson planning and content delivery by instructors, focusing on the structured framework of the 5-SLP. For instance, Podolsky, Kini, and Darling-hammond (2019) argued that seasoned educators frequently demonstrate more sophisticated preparation and delivery techniques than their less seasoned peers. Additionally, the study adds that instructors with more educational backgrounds might present topics more effectively if they have a deeper understanding of the subject. These differences show how important it is to have a sophisticated grasp of how these variables interact to influence instructional strategies in various educational settings (Podolsky, Kini, and Darling-hammond 2019). Studies (Laabidi 2016; Kennan et al. 2018; Rahida Aini, Rozita, and Zakaria 2018; Tran and Do 2022) revealed that age has a big impact on how teachers educate. An abundance of expertise that comes with being older teachers helps them develop more sophisticated planning and delivery techniques. According to the mentioned studies (Laabidi 2016; Kennan et al. 2018; Rahida Aini, Rozita, and Zakaria 2018; Tran and Do 2022), more experienced teachers typically have a deeper comprehension of the requirements of their learners and the changing aspects of the learning environment, which enables them to write more successful lesson plans. Contrary to the findings, Dami et al. (2020) argued that younger educators might improve student engagement by incorporating creative ideas and flexibility into their lessons.

Numerous studies have been conducted on the subject of gender variations in teaching approaches. According to Ahmed, Ambreen, and Hussain (2018) and Demir and Nihat (2021), male educators may tend toward authoritative teaching philosophies, while female educators might embrace more collaborative and nurturing approaches. Furthermore, these variations may have an impact on the design and delivery of classes, which may have

an impact on learning results and student engagement. To create inclusive teaching practices that serve a variety of student demographics, it is imperative to comprehend these interactions. On the other hand, Lee and Lee (2020) report that teachers' abilities to present content are directly correlated with their academic backgrounds. They posit that higher education frequently results in a stronger comprehension of the subject matter for teachers, which might improve their capacity to explain difficult ideas clearly. Research has shown that teachers with advanced degrees are more likely to use research-proven teaching strategies, which improve student results (Lin and Magnuson 2018). This partnership emphasises how crucial it is for educators to continue their professional growth and training.

The importance of demographic factors in affecting teachers' performance as educators has been highlighted by recent studies (Rivaldo and Nabella 2023; Adewale 2024). According to a research done in Nigeria, Adewale (2024) argued that the gender and age of teachers have significant impacts on how good they are at teaching; older and more seasoned teachers are more effective at delivering lessons. Similarly, Dien, Abang, and Ngban (2022) discovered that the efficiency of teachers is significantly influenced by their age and level of experience, indicating that seasoned teachers contribute important perspectives and techniques to the classroom. The above findings demonstrate how important it is for educational stakeholders to take demographics into account when creating professional development programs so that training is customised to capitalise on the advantages of different teacher profiles.

In teaching and learning, it has been demonstrated that incorporating structured lesson planning frameworks, like the five-stage lesson plan (5-SLP), improves instructional delivery and material sequencing. Shirawia et al. (2023) suggested that these frameworks help teachers integrate new ideas to existing knowledge in a methodical and logical way, which increases the effectiveness of their instruction. Additionally, a study from Meru County, Kenya, highlighted how crucial it is for Christian Religious Education teachers to understand and apply the 5-SLP framework, showing that organised lesson planning enhances both student performance and the delivery of content (Saoke et al. 2022). These studies support the use of thorough lesson preparation models to improve teaching methods in a range of subject areas. The dynamic interaction between teacher demographics and structured lesson planning in improving instructional effectiveness is highlighted by incorporating these recent findings into the body of current literature. Understanding and resolving these issues can result in more focused and successful teaching methods, which will eventually enhance student performance in a variety of learning environments.

Notwithstanding current knowledge, there persists a gap in comprehending the relationship of these variables and their combined impact on the efficacy of teaching. Through an examination of the connections among age, gender, experience and education, this research seeks to offer insightful information that can guide professional development activities and teacher preparation programs. This study comes at a perfect time for educational institutions looking to enhance student results and the quality of their instruction. Through the identification of the factors that influence good teaching practices, educators can create

focused interventions that aid in teachers' professional development. This research highlights the effectiveness of teaching and provides useful suggestions for improving teacher preparation and growth within the context of the 5-SLPS. Regarding this, the study aimed at achieving the following goals: (i) ascertain the impact of gender, experience and academic background on teachers' planning and content delivery; and (ii) evaluate how age, gender, experience and academic background interact with one another to affect teachers' planning and content delivery within the framework of the 5-SLP.

2 | Study Methodology

2.1 | Study Area

The research was conducted in Meru County, the Eastern region of Kenya. With six sub-counties, there were 367 secondary schools at the time of the survey. The subcounties were Buuri, Imenti Central, Imenti South, Imenti North, Igembe East and Igembe West, with 59, 66, 63, 69 and 36 secondary schools, respectively. Except for Buuri, where the research instrument's piloting took place, five subcounties were included in the study. Thus, 331 secondary schools, 307 being public schools and 24 private schools were involved in this study. The secondary schools were classified as extracounty, county, national and sub-county secondary schools, with 4, 21, 83 and 223, respectively. There were also 646 CRE teachers from 6520 secondary school teachers in the region.

2.2 | Study Variables

The content delivery and teachers' planning were the dependent variables in this study. Criteria in line with the 5-SLPS could be used to assess teachers' planning (Saoke et al. 2022). The 5-SLP framework, which emphasises logical and sequential instructional delivery, served as the basis for the assessment standards used in the study to evaluate teachers' lesson plans and material delivery. Using an ordinal scale (1 or 0) to indicate whether a given stage was sufficiently planned, the inclusion of each 5-SLP stage was examined in order to assess the teaching plan. The practical use of these phases during lessons was additionally employed to evaluate content delivery. These standards, which prioritised connection between learning objectives and real-world classroom activities, were based on pedagogical best practices. For assessing planning and execution, the binary and ordinal metrics offered a consistent yet adjustable approach, maintaining the validity and objectivity of the assessment procedure. Peer evaluations, supervisor ratings and teacher self-reports are a few examples of this. Furthermore, evaluations by educational specialists, student feedback and observations could be used to gauge the quality of content delivery. Metrics like instruction clarity, engagement tactics and the capacity to accomplish learning objectives explained the measurement of this variable. As a result, the planning and content delivery scores for teachers were 1 or 0 depending on whether they used a predetermined stage or not (Table 1).

The study's independent factors were experience, education level, gender and age. An independent variable is typically one

TABLE 1 | Variable description.

Variables	Description	Sign
<i>Dependent variables</i>		
Teachers' planning	Ordinal: Number of stages planned	
Content delivery	Ordinal: Number of stages utilised	
<i>Independent variables</i>		
Gender	Binary: 1 if female, 0 male	–
Age	Categorical: 1 30 and below, 2 30–40, 3 41 and above	+
Qualification	Categorical: 1 Diploma, 2 degree, 3 diploma, 4 PhD	+
Experience	Categorical: 1 below 5, 2 6–10, 3 11–15, 4 15 and above	+

that is changed or categorised to see how it affects dependent variables (Diel, Weigelt, and Macdorman 2021). In the relationship under study, it is assumed to be the cause or an influential factor. Generally, gender is often seen as a binary variable in research, with labels like 'Male' and 'Female' (Lindqvist et al. 2021). Nonbinary gender, on the other hand, can also fall under categories like 'Nonbinary'. Gender was handled as a binary variable in this study, with one and two denoting male and female, respectively. It was assessed using information from self-reports as reported by Arnegard et al. (2020). The individual is typically used as the unit of analysis when gender is examined as an independent variable. The gender of each participant was noted and utilised in the analysis to see how it affects the dependent variable.

When age is employed as an independent variable in a study, its correlations and effects on other dependent variables are examined. Most often, age is measured as a continuous variable, which means that any value within a range can be assigned to it (Voor In 't Holt 2019). Age, for example, can be expressed in days, months or years. Age was divided into ranges for this study to facilitate analysis and address certain research requirements. When examining age-related trends or doing demographic research, this is especially helpful. Usually, direct questions in questionnaires or surveys are used to gather age information. The individual is the main analytical unit used to measure age. The age of each individual was noted and examined to ascertain how it affects dependent variables as indicated by Dami et al. (2020).

The selection of gender and age as independent variables is justified by their capacity to highlight small variations in teaching efficacy and behaviours. Teaching philosophies and approaches may be significantly influenced by age and gender. For example, Yu, Kreijkjes, and Salmela-Aro (2022) have indicated that male and female teachers may use distinct teaching philosophies, which may affect how they design lessons and present material. Age and

gender may not necessarily have substantial effects on their own, but when paired with other factors like experience or educational background, they may have combined effects (Jabaar 2018). The literature recognises that demographic factors like age might indirectly affect teaching efficacy through experience accumulation and instructional strategy maturity, even though explicit connections may not be very strong. Given that these factors may interact with one another to influence results in subtle ways, the inclusion of gender and age thus represents a thorough approach to understanding the dynamics of teaching efficacy.

To determine how academic qualification affected or was related to other dependent variables in the study, it was investigated as an independent variable. Typically, academic qualification is a categorical variable that denotes various educational achievement levels (Dami et al. 2020). The various qualification levels for this investigation were given numerical designations to indicate their sequence. Usually, surveys or questionnaires using self-reported data are used to determine academic qualifications. The individual is typically the unit of study when examining academic qualifications. The amount of schooling attained by each individual was noted and utilised to evaluate how it affects dependent variables.

There are two types of experience: work experience can refer to both the length and nature of a person's professional experience in a given industry or role as well as general experience, which typically includes various types of experience like life experience or specialised skills learned outside of a formal job (Purnomo, Perizade, and Syapril 2023). Experience can be analysed by grouping it into predetermined categories. The most common method is to measure the total number of years of experience. Self-reported surveys are frequently used to quantify experience, asking participants to share information about their past employment history and other pertinent events. The person is the main analytical unit used to measure experience. Every individual's experience was documented and utilised to investigate how it affects dependent variables as indicated by Lestari and Ubaidillah (2022).

2.3 | Study Design, Sample Strategy and Sampling Size

For the design and execution of the study, researchers utilised a cross-sectional survey approach. All the phenomena under study had the data collected at a specified period due to the design (Zangirolami-raimundo and de Oliveira 2018). The intended participants were Meru County's 646 teachers. To choose the schools in the subcounties where the CRE instructors participated, random selection was employed. The list of schools where the participants were drawn was generated using a table with randomly assigned numbers. It was made possible for the CRE instructors from each subcounty to take part in this study with the help of proportional stratified sampling. Additionally, the sample size of the participants who answered the questionnaire was calculated using Slovin's approach, as shown by Susanti et al. (2019) and Saoke et al. (2023).

The sample size was determined by researchers as described in Equation (1).

$$n = N / (1 + Ne^2) \quad (1)$$

where n is the sample size, N is the total population (646), and e is the margin of error (0.05). Consequently, 247 was the sample size. With a 91% response rate, 226 teachers participated fully in the study.

2.4 | Ethical Consideration

The University of Embu's research ethical requirements were followed in this research. Before collecting field data, a research approval letter was acquired from the Ministry of Higher Education, Science and Technology's National Council for Science and Technology (NACOSTI). Informed consent was obtained from the Ministry of Education and the Meru County Commissioner's office, and an ethical evaluation of the research was also conducted. Before starting the investigation, written letters of authorisation were obtained from the head teachers of the chosen secondary schools. The CRE teachers who were interviewed for the study provided informed consent. The study made sure that the concepts of voluntary participation and privacy were upheld.

2.5 | Data Collection

Using a questionnaire and observation checklist, researchers gathered data from 247 teachers who were sampled out of the 646 teachers. The study therefore involved 247 CRE teachers through questionnaire and observation. To collect comprehensive demographic data, professional traits and insights into the planning and teaching procedures of the participating teachers, semistructured questionnaires were carefully created. With a focus on particular indications including the use of anticipatory sets, clarity in introducing new content, facilitation of guided and independent practice and success in lesson closure, the observation checklists were designed to precisely correspond with the stages of the 5-SLP. A binary scoring system (1 or 0) was used in the checklist to indicate whether or not each step had been executed successfully. Prior to their implementation throughout the five major subcounties of Meru County, the instruments were refined based on input from a pilot test conducted in Buuri subcounty of the Meru County to guarantee validity and reliability. These carefully adjusted these tools to guarantee reliable data gathering process, which enhanced the study's transparency and dependability. The instruments included inquiries about the participants' backgrounds, characteristics, teachers' planning and content delivery practices. When it came to efficiency and cost-effectiveness, a questionnaire turned out to be the least expensive approach (Aithal and Aithal 2020). The survey and observation were carried out by the researcher. Following a smooth process of gathering questionnaires and observation exercises, 91% of respondents completed the survey. Thus, of the 247 administered questionnaires, the researcher was able to effectively gather 226.

2.6 | Statistical Analysis

The data for this investigation were analysed using STATA 15.0 software. Additionally, statistics analysis was carried out after data cleaning and coding. Both descriptive and inferential statistics were employed in the study. Teachers' preparation and content delivery are related in a count data way that may be examined with panel vector autoregression (VAR) and multiple regression modelling. All events are assumed to have the same probability of occurring in multiple regression and VAR. Nevertheless, planning and material delivery by teachers do not have the same likelihood of occurrence. Because CRE teachers accomplish content delivery after planning, there may be differences in the tendency of teachers' planning and the content delivery that follows.

Notably, teachers' planning and their content delivery could also differ based on their demographic and professional attributes, including; gender, age, academic qualification and experience. The relationship between teachers' planning and their content delivery with a focus on gender, age, academic qualification and experience are ordinal variables that could be analysed using the multivariate analysis of variance and tests of between-subjects effects as described by Bathke et al. (2018), Mullet and Chasseigne (2017) and Musafiri et al. (2022). The data were verified before being subjected to multivariate analysis of variance and tests of between-subjects' effects analysis. Variance inflation factors (VIF), tolerance (1/VIF) and multicollinearity tests were applied to the independent variables.

Conducting MANOVA followed by tests of between-subjects Effects analysis provides a comprehensive understanding of how multiple independent variables collectively and individually influence multiple dependent variables. While MANOVA determines if there are significant multivariate effects, tests of between-subjects Effects identify which specific independent variables significantly affect each dependent variable. Estimating predictors of ordinal variables (teachers' preparation and material delivery) is made possible by this analysis. A latent variable Y^* , which represents the unobservable measure of teachers' preparation and content delivery, could be used to evaluate the predicted result (Yin et al. 2020) as described in Equation (2).

$$Y = XB + E \quad (2)$$

where Y is the matrix of dependent variables; X is the matrix of independent variables (design matrix); B is the matrix of regression coefficients; E is the matrix of errors (residuals).

The data's unbalanced design was considered using the Type III Sum of Squares approach. Table 9 displays the results of the MANOVA tests together with the F-statistics and p values indicating the significance level for each independent variable's impact on the dependent variables. A $p < 0.05$ statistical significance level was used to determine the results. To better explore the complexity of the relationships, Tests of the between-subjects Effects were conducted to examine the interaction effects among the independent variables. Tests of between-subjects' effects could analyse the interactions between the four independent

variables. The tests of between-subjects' effects are described in Equation (3).

$$Y_{ij} = \mu_j + \beta_{1j}X_1 + \beta_{2j}X_2 + \beta_{3j}X_3 + \beta_{4j}X_4 + \epsilon_{ij} \quad (3)$$

where Y_{ij} is the score of the iii th participant on the jjj th dependent variable, μ_j is the overall mean for the jjj th dependent variable, β_{kj} is the regression coefficient for the kkk th independent variable on the jjj th dependent variable, kXk is the value of the kkk th independent variable and ϵ_{ij} is the error term for the iii th participant on the jjj th dependent variable. This analysis provided insights into how combinations of age, gender, experience and academic qualifications influenced teachers' planning and content delivery. The results of these interactions are detailed in Table 9, highlighting significant interactions that warrant further investigation. Post hoc analyses employing Tukey's HSD (honestly significant difference) test were carried out where significant differences were discovered to pinpoint particular group differences. This allowed for an understanding of how different levels of the independent variables impacted the dependent variables.

3 | Results and Discussion

3.1 | Descriptive Characteristics of the Participants

Table 2 provides a descriptive statistic for each of the four components in a sample of 226 teachers. Since gender is normally a categorical variable, it was assigned a numerical number of 1 for males and 2 for females. The majority of the sample appears to be closer to the code for females, as indicated by the mean of 1.63. According to these findings, women make up the majority of CRE instructors. In agreement with the study results, Kugler, Tinsley, and Ukhaneva (2021) argued that a variety of social, cultural and institutional factors might influence the degree to which female teachers are more attached to Christian Religious Education than their male counterparts. Women are frequently viewed as nurturers and caregivers in various cultures. Teaching courses like CRE, which usually include instruction on morality and ethics, may be consistent with traditional gender roles that emphasise providing care and nurturing (Kugler, Tinsley, and Ukhaneva 2021).

A wide age range in this study has been demonstrated by a mean of 2.70 (Table 2) and a greater standard deviation, which suggests significant age variance among the individuals. Enhancing the depth, breadth, and application of study findings requires a

significant age range among research participants. In support of the study findings, Chang et al. (2017), posit that a wide age range enhances the study's external validity, makes it possible to analyse age-related changes and trends in great detail and makes it easier to create focused interventions.

The average level of academic education, as indicated by the mean of 2.04 (Table 2), literally suggests that the majority of participants hold a bachelor's degree. This variable's numerical codes, 1 for diploma, 2 for bachelor's and 3 for master's degree and above confirm that the majority of CRE teachers have degrees. According to Rusilowati and Wahyudi (2020), due to the necessity of having advanced subject matter expertise, adhering to certification and regulatory standards and realising the value of delivering high-quality education, the majority of secondary teachers hold degrees. Currently, many educational systems consider a bachelor's degree to be one of the minimum standards for secondary school teachers.

Table 2 on experience data revealed a mean of 1.92 and a greater standard deviation, indicating a moderate range of experience levels among CRE instructors. Participants with more experience are more likely to understand the topic matter better and to give meaningful and correct answers. Increased experience could lead to more dependable and consistent responses from participants, which would lessen variability brought by misinterpretations or unfamiliarity (Podolsky, Kini, and Darling-hammond 2019). Research results can be more thorough and useful if the viewpoints of individuals with and without experience are balanced.

3.2 | Relationship Between Planning and Content Delivery Through the Five-Stage Lesson Plan Structure

Table 3 shows a clear improvement in the anticipatory set, new materials, guided practice, individual practice and lesson closure from planning to content delivery. This suggests that participants were more successful at delivering the content than planning its many components.

Furthermore, practically all participants prepared and performed the lesson closure with competence, demonstrating great consistency and effectiveness in this component.

The findings demonstrate that across all instructional components, participants generally improved from the planning to the content delivery phases. The provision of fresh materials and autonomous practice showed the biggest advancements. Planned and executed lessons were routinely delivered with effectiveness. This suggests that although preparation is essential, the actual delivery phase is more effective, maybe as a result of participants' practical application and in-the-moment modifications. According to Yuan et al. (2018), instructors may present material that was not intended to be covered for a variety of reasons, including the dynamic nature of the classroom setting. Sometimes instructors must modify their lessons to meet the demands, inquiries or interests of their students right away. This may result in the addition of impromptu material to engage students, address queries or make concepts more clear.

TABLE 2 | Descriptive characteristics of participants.

Variables (N=226)	Mean	Std. error of mean	Std. deviation	Variance
Gender	1.63	0.032	0.483	0.233
Age	2.70	0.094	1.420	2.016
Academic qualification	2.04	0.022	0.325	0.105
Experience	1.92	0.070	1.053	1.108

TABLE 3 | Planning versus content delivery.

Variables	Planning (<i>N</i> = 226)			Delivery (<i>N</i> = 226)		
	Mean	Std. error	Std. deviation	Mean	Std. error	Std. deviation
Anticipatory set	0.60 (136)	0.033	0.491	0.82 (185)	0.026	0.386
New materials	0.57 (129)	0.033	0.497	0.92 (208)	0.018	0.264
Guided practice	0.56 (127)	0.033	0.498	0.66 (149)	0.033	0.475
Independent practice	0.61 (138)	0.033	0.490	0.98 (221)	0.010	0.147
Lesson closure	0.97 (219)	0.011	0.161	1.00 (226)	0.000	0.000
Average	0.662	0.128	0.1923	0.876	0.0087	0.1315

TABLE 4 | Correlation of independent variables.

	Gender	Age	Qualification	Experience
Gender	1.000			
Age	−0.027	1.000		
Qualification	−0.048	−0.046	1.000	
Experience	0.041	0.042	0.074	1.000

The average illustrates that while participants are more effective in content delivery than planning, there is also less variability in content delivery effectiveness. The lower standard error for content delivery indicates that the mean score is a more reliable estimate compared to the planning mean score. This could suggest that participants are better at implementing lessons and adapting in real time than in the initial planning stages.

The mean score for planning (0.662) is substantially lower than the mean score for content delivery (0.876). This demonstrates that, on the whole, participants were more successful at delivering material than at planning it. Compared with planning, where the standard error of the mean is (0.128), content delivery has a standard error of the mean of (0.0087). This suggests that, in comparison to the estimate for planning, the sample mean estimate for content delivery is more accurate and consistent. Finally, compared with content delivery (0.1315), planning has a higher standard deviation (0.1923). In consistent with the study outcome, Yin et al. (2020), recommended that there is more variation in participants' planning efficacy than in their content delivery efficacy.

3.3 | Multicollinearity of Independent Variables

The correlation coefficients between the four independent variables; gender, age, education and experience are displayed in Table 4. The degree and direction of the linear correlations between these variables were assessed using the Pearson correlation coefficients.

The strength and direction of the relation between two variables are represented by the range of −1 to 1. With coefficients almost equal to zero, all of the relationships between the variable pairings are extremely weak (Table 4). There are no significant linear

associations between gender, age, education and experience in this dataset, based on the poor correlations. Since there is no statistically significant correlation between the relationships, it may be concluded that changes in one variable do not significantly affect changes in another. This correlation is inconsistent with (Shrestha 2020).

The variance inflation factor (VIF) was used in this investigation to identify multicollinearity (Table 5).

When two or more independent variables exhibit a strong correlation, it is known as multicollinearity, and it can have an impact on the estimations of regression coefficients as well as their statistical significance (Saoke et al. 2022). The VIF scores indicate that multicollinearity is not a significant issue for this data set on average. The moderate VIF values of age and experience (about 2.8) suggest some multicollinearity, but not to the extent that would normally call for remedial action ($VIF > 5$ or 10). The VIF results in this analysis show that for most of the variables, multicollinearity is not a serious concern.

3.4 | Predictors of Teachers' Planning and Content Delivery

The intercept has a substantial influence on the dependent variables, planning and content delivery, as shown by the very significant results of all tests ($p < 0.001$) for Pillai's Trace (1), Wilks' Lambda (2), Hotelling's Trace (3) and Roy's Largest Root (4) (Table 7).

Tables 6 and 8 indicate that there is no significant variance ($p > 0.05$) between the genders in the dependent variables, planning and content delivery. There may be several explanations for this lack of significance and recognising them necessitates taking into account the particular data and context. Planning and content delivery homogeneity could be a major contributing factor to the lack of significance. As the same as the population under study, El-Emadi, Said, and Friesen (2019) agreed that there may not be a noticeable gender difference in the planning and material delivery abilities, training and experience of male and female teachers due to similar levels of preparation.

One important predictor was age. Tables 6 and 8 indicate that age significantly influences the dependent variables. All tests were significant ($p < 0.05$). Given that age is a strong predictor

of planning and content delivery, age may be the reason for individual disparities in these abilities or habits. The expertise and maturity that older people are likely to possess can improve their ability to organise and deliver information (Dami et al. 2020). Over time, they might have had more chances to develop these abilities via real-world use. In support of the study findings, Voor In 't Holt (2019) found that different age groups may approach planning and content delivery differently due to differing life stages and responsibilities. Older people, for instance, may have greater duties that call for advanced planning abilities.

The lack of significant tests ($p > 0.05$) for the academic qualification indicates that the academic variable has little or no effect on the dependent variables (Tables 6 and 8). Even though

they are essential, academic credentials might not always be the best indicator of efficient planning and content delivery in a variety of professional and educational contexts. The findings agreed with (Musau and Aberu 2015), who indicated that teachers' qualifications do not significantly impact their planning and content delivery respectively. Furthermore, although academic credentials offer a strong basis of knowledge, they do not determine the effectiveness of planning or material delivery in this study. Contrary to the findings, Manning et al. (2017), found that teachers' qualification increases the knowledge of planning and content delivery, thus increasing implementation of active teaching practices. Enhancing these abilities may require other elements including real-world experience, soft skills, creativity, application of knowledge, ongoing learning and feedback responsiveness.

The final test result, which revealed no significant differences ($p > 0.05$), indicated that experience had no apparent effect on the dependent variables (Tables 6 and 8). The insignificant prediction of experience was unpredicted. This finding aligns with the results of Podolsky, Kini, and Darling-hammond (2019), who suggested that while expertise is a significant factor in teaching and learning, it is not always a reliable predictor of effective preparation and content delivery. People with a lot of experience can get stuck in their ways and are reluctant to try new things or use new technologies. Contrary to the findings, Getachew, Simane, and Eshete (2016) and Saoke et al. (2022) found that

TABLE 5 | Multicollinearity of independent variables.

Variables	VIF	1/VIF
Gender	1.004	0.996
Age	2.840	0.300
Qualification	1.003	0.997
Experience	2.872	0.300
Mean VIF	1.930	

TABLE 6 | Effects of independent variables on planning and content delivery.

Variable (N = 226)	Test	Value	F	Hypothesis df	Error df	Sig.
Intercept	1	0.741	256.718	2	179	0.000
	2	0.259	256.718	2	179	0.000
	3	2.868	256.718	2	179	0.000
	4	2.868	256.718	2	179	0.000
Gender	1	0.007	0.657	2	179	0.519
	2	0.993	0.657	2	179	0.519
	3	0.007	0.657	2	179	0.519
	4	0.007	0.657	2	179	0.519
Age	1	0.156	2.529	12	360	0.003
	2	0.847	2.579	12	358	0.003
	3	0.177	2.629	12	356	0.002
	4	0.157	4.713	6	180	0.000
Academic	1	0.022	0.979	4	360	0.419
	2	0.979	0.977	4	358	0.420
	3	0.022	0.975	4	356	0.421
	4	0.020	1.774	2	180	0.173
Experience	1	0.047	1.082	8	360	0.375
	2	0.953	1.080	8	358	0.376
	3	0.048	1.078	8	356	0.377
	4	0.039	1.734	4	180	0.144

TABLE 7 | Interaction effect of independent variables on planning and content delivery.

Interaction variables	Test	Value	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	Sig.
Gender * Age	1	0.073	1.705	8	360	0.096
	2	0.927	1.725	8	358	0.091
	3	0.078	1.745	8	356	0.087
	4	0.076	3.433	4	180	0.010
Gender * Academic	1	0.011	0.483	4	360	0.748
	2	0.989	0.481	4	358	0.750
	3	0.011	0.480	4	356	0.751
	4	0.010	0.923	2	180	0.399
Gender * Experience	1	0.055	1.704	6	360	0.119
	2	0.945	1.702	6	358	0.119
	3	0.057	1.701	6	356	0.120
	4	0.046	2.730	3	180	0.045
Age * Academic	1	0.065	2.007	6	360	0.064
	2	0.936	2.014	6	358	0.063
	3	0.068	2.021	6	356	0.062
	4	0.059	3.546	3	180	0.016
Age * Experience	1	0.148	1.601	18	360	0.057
	2	0.855	1.624	18	358	0.052
	3	0.167	1.647	18	356	0.047
	4	0.142	2.848	9	180	0.004
Academic * Experience	1	0.072	3.372	4	360	0.010
	2	0.928	3.387	4	358	0.010
	3	0.076	3.402	4	356	0.010
	4	0.066	5.963	2	180	0.003

TABLE 8 | Tests of between-subjects effects for each dependent variable.

Variables	Planning					Content delivery				
	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Intercept	15.024	1	15.024	56.480	0.000	28.759	1	28.759	489.586	0.000
Gender	0.007	1	0.007	0.027	0.870	0.078	1	0.078	1.321	0.252
Age	1.730	6	0.288	1.084	0.374	1.380	6	0.230	3.915	0.001
Academic	0.552	2	0.276	1.037	0.357	0.130	2	0.065	1.104	0.334
Experience	0.623	4	0.156	0.586	0.673	0.352	4	0.088	1.498	0.205

teachers' experience was a significant positive element in the planning and content delivery process.

Additionally, the combined impacts of independent variables on content delivery and planning were examined in the study (Table 7). The four multivariate tests were employed to calculate

the interactions between various independent parameters and content delivery and planning.

The significance of the interaction effects on the dependent variables is investigated in each test. The significant interaction effect between two independent variables indicates that when

TABLE 9 | Interaction tests of between-subjects effects.

Variables	Planning					Content delivery				
	Type III sum of squares	df	Mean square	F	Sig.	Type III sum of squares	df	Mean square	F	Sig.
Gender * Age	0.868	4	0.217	0.815	0.517	0.563	4	0.141	2.398	0.052
Gender * Academic	0.069	2	0.035	0.130	0.878	0.104	2	0.052	0.886	0.414
Gender * Experience	0.768	3	0.256	0.962	0.412	0.408	3	0.136	2.318	0.077
Age * Academic	0.789	3	0.263	0.988	0.400	0.502	3	0.167	2.846	0.039
Age * Experience	1.910	9	0.212	0.798	0.619	1.238	9	0.138	2.341	0.016
Academic * Experience	0.526	2	0.263	0.989	0.374	0.670	2	0.335	5.707	0.004

both components are high, planning and content delivery is more effective (Adebayo and Ibrahim 2018). To obtain the best results in content delivery, this interaction emphasises the necessity of a holistic approach to professional development and training, whereby both theoretical knowledge and practical experience are valued and incorporated.

Planning and content delivery are strongly impacted by the combined effect of gender and age, gender and experience, according to Roy's Largest Root test, which reveals a significant interaction effect between gender and age, gender and experience ($p=0.010$) and ($p=0.045$), respectively. This result is consistent with Schmid, Brianza, and Petko (2021), who found that gender, age and experience put together have a positive impact on planning and content delivery. However, there are no significant results from the other tests (Pillai's Trace, Wilks' Lambda and Hotelling's Trace), indicating that the test that is used may have an impact on the significance. Even though other tests were not significant, the substantial impacts appear to be centred in these interactions based on the significant interaction effects found by Roy's Largest Root test.

Roy's Largest Root test indicates a significant interaction impact between age and experience when age is taken into consideration ($p=0.004$), age and academic qualification ($p=0.016$), age and both experience and academic qualification, indicating that the combined effect has a substantial impact on planning and content delivery. Some tests do not meet the traditional significance thresholds, although they are close to being significant. The complex relationships between these variables and their effects on planning and content delivery are shown by the considerable interaction effects between age and experience and age and academic degree that Roy's Largest Root test indicates. The findings are in agreement with Adams, Sumintono, and Mohamed (2018), who found that when creating professional development initiatives and interventions targeted at enhancing teaching efficacy, age and experience as well as age and academic background, should be taken into account simultaneously.

All four tests show significant interaction effects between the two variables (p -values ranging from 0.003 to 0.010) for the academic and experience interaction effect. This implies that planning and content delivery are greatly impacted by the combination of experience and academic training. The remarkable interaction effects suggest that the degree of academic qualification influences the relationship between experience and planning or content delivery (Getachew, Simane, and Eshete 2016; Manning et al. 2017). This shows that increasing one's expertise and academic credentials together have a greater influence on planning and content delivery than each of the two factors alone.

Tests of between-subjects' effects provided a comprehensive framework for evaluating the impacts of categorical independent factors on continuous dependent variables, both separately and in combination, to enhance the comprehension of the complex relationships in this study (Table 8).

Determining whether distinct groups (or levels) of an independent variable have statistically significant effects on a dependent variable is the aim of the between-subjects' Effects Tests (Table 8). Additionally, it was used in this study to validate the multivariate analysis results in Table 6. It indicated that the content delivery and planning intercepts are highly significant, suggesting that these outcomes' baseline levels are noteworthy. Planning and content delivery are not significantly impacted by factors such as gender, experience or level of education as indicated by Musau and Abere (2015) and Podolsky, Kini, and Darling-hammond (2019). Age significantly affects content delivery but not planning, suggesting age-related differences in delivering content effectively.

Table 9, which looks at how different combinations of independent variables affect dependent variables, planning and content delivery, generally validates the multivariate analysis results displayed in Table 7. The connection between the magnitude of one independent variable and the dependent variable is influenced by the interaction effects.

The combinations of age with an academic qualification, age with experience and academic qualification with experience significantly affect content delivery as indicated by (Getachew, Simane, and Eshete 2016; Manning et al. 2017; Adams, Sumintono, and Mohamed 2018; Saoke et al. 2022). These significant interactions indicate that the combined effects of these variables are more complex and have a meaningful impact on how content is delivered.

These results highlighted how crucial it is to take into account the combined influences of experience, education and age when attempting to improve material delivery. Content delivery tactics can be improved by creating training and development programs that are specifically designed to take these interactions into consideration.

4 | Conclusion and Recommendation

In conclusion, the study emphasises the complex connection especially in Kenyan secondary schools between content delivery and teacher preparation within the framework of the 5-SLP. The results demonstrate that teachers' approaches to lesson design and material delivery are significantly influenced by demographic characteristics, including age, gender, experience and educational background. Notably, research shows that teachers with advanced academic qualifications employ more effective teaching strategies, which improves student engagement and learning outcomes. Furthermore, the differences in teaching philosophies between male and female educators demonstrate the importance of inclusive teaching techniques that address varied student needs. This understanding is critical for educational institutions that want to increase instructional quality and student success.

The implications of this research extend beyond academic inquiry; they provide practical insights for teacher preparation programmes and professional development activities. Educational stakeholders can design focused interventions to promote teachers' professional development by understanding the unique characteristics that contribute to good teaching practices. This study supports ongoing training and development opportunities that take into account educators' different backgrounds and experiences, resulting in a more effective learning environment. The results of this study can be used as a basis to enhance teaching effectiveness and guarantee that every student receives a top-notch education that is customised to meet their unique learning needs as educational systems develop.

Based on the findings of this study, educational institutions should adopt comprehensive professional development programs targeted to instructors' different demographic features, such as academic qualification, experience, gender and age. These programs should aim to improve teachers' understanding and use of the 5-SLP structure, emphasising the significance of good planning and content delivery in increasing student engagement and learning outcomes. Furthermore, it is critical to foster collaborative learning environments in which teachers can share best practices and techniques for catering to different student populations. This could include mentorship programs that link experienced educators with novice teachers, as well

as workshops that promote the interchange of creative teaching methods. Higher educational outcomes and a more productive teaching workforce can arise from educational institutions that foster a culture of diversity and continual professional development for teachers. This will enable instructors to better meet the diverse needs of their learners.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data are available on request from the authors.

References

- Adams, D., B. Sumintono, and A. Mohamed. 2018. "E-Learning Readiness Among Students of Diverse Backgrounds in a Leading Malaysian Higher." *Malaysian Journal of Learning and Instruction* 15, no. 2: 227–256.
- Adebayo, P., and A. Ibrahim. 2018. "Power and Type I Error Rate Comparison of Multivariate Analysis of Variance." *Trends in Science & Technology Journal* 3, no. 2: 628–635.
- Adewale, S. 2024. "The Nexus Between Teachers' Demographic Characteristics and Utilization of 21st Century Collaborative Teaching Strategies in Classrooms." *International Journal of Learning, Teaching and Educational Research* 23, no. 6: 488–503. <https://doi.org/10.26803/ijlter.23.6.22>.
- Ahmed, M., M. Ambreen, and I. Hussain. 2018. "Gender Differentials Among Teachers' Classroom Management Strategies in Pakistani Context." *Journal of Education and Educational Development* 5, no. 2: 178–193.
- Aithal, A., and P. S. Aithal. 2020. "Development and Validation of Survey Questionnaire & Experimental Data—A Systematic Review-Based Statistical Approach." *International Journal of Management, Technology, and Social Sciences (IJMTS)* 5, no. 2: 233–251.
- Akyuz, D. 2023. "Exploring Contextual Factors for Pre-Service Teachers Teaching With Technology Through Planning, Teaching, and Reflecting." *International Electronic Journal of Mathematics Education* 18, no. 1: 1–14. <https://doi.org/10.29333/iejme/12624>.
- Arnegard, M. E., L. A. Whitten, C. Hunter, and J. A. Clayton. 2020. "Sex as a Biological Variable: A 5-Year Progress Report and Call to Action." *Journal of Women's Health* 29, no. 6: 858–864. <https://doi.org/10.1089/jwh.2019.8247>.
- Bathke, A. C., S. Friedrich, M. Pauly, et al. 2018. "Testing Mean Differences Among Groups: Multivariate and Repeated Measures Analysis With Minimal Assumptions." *Multivariate Behavioral Research* 3171: 348–359. <https://doi.org/10.1080/00273171.2018.1446320>.
- Bragg, L. A., C. Walsh, and M. Heyeres. 2021. "Successful Design and Delivery of Online Professional Development for Teachers: A Systematic Review of the Literature." *Computers and Education* 166: 104158. <https://doi.org/10.1016/j.compedu.2021.104158>.
- Chang, A. Y., V. F. Skirbekk, S. Tyrovolas, N. J. Kassebaum, and J. L. Dieleman. 2017. "Measuring Population Ageing: An Analysis of the

- Global Burden of Disease Study 2017." *Lancet Public Health* 4, no. 3: e159–e167. [https://doi.org/10.1016/S2468-2667\(19\)30019-2](https://doi.org/10.1016/S2468-2667(19)30019-2).
- Dami, Z. A., F. Purwanto, G. Sudarmanto, and R. Wulandari. 2020. "The Effect of Religiosity on Organizational Citizenship Behaviour With Gender, Age, and Working Period as Moderators Variable." *International Journal of Instruction* 13, no. 4: 231–246. <https://doi.org/10.29333/iji.2020.13415a>.
- Demir, O., and S. Nihat. 2021. "Investigation of the Communication Skills, Professional Seniority, School Stage and Gender as Predictors of Teachers' Classroom Management Styles." *Research in Pedagogy* 11, no. 2: 661–679. <https://doi.org/10.5937/istrped2102661d>.
- Diel, A., S. Weigelt, and K. F. Maccorman. 2021. "A Meta-Analysis of the Uncanny Valley's Independent and Dependent Variables." *ACM Transactions on Human-Robot Interaction* 11, no. 1: 1–33. <https://doi.org/10.1145/3470742>.
- Dien, C. A., K. B. Abang, and A. N. Ngban. 2022. "Demographic Factors and Teachers' Effectiveness Among Secondary School Teachers in Calabar Education Zone Cross River State, Nigeria." *Global Journal of Educational Research* 21, no. 2: 149–157. <https://doi.org/10.4314/gjedr.v21i2.8>.
- El-Emadi, A. A., Z. Said, and H. L. Friesen. 2019. "Teaching Style Differences Between Male and Female Science Teachers in Qatari Schools: Possible Impact on Student Achievement." *Eurasia Journal of Mathematics, Science and Technology Education* 15, no. 12: em1800. <https://doi.org/10.29333/ejmste/109236>.
- Fujii, T. 2016. "Designing and Adapting Tasks in Lesson Planning: A Critical Process of Lesson Study." *ZDM Mathematics Education* 48: 411–423. <https://doi.org/10.1007/s11858-016-0770-3>.
- Getachew, M., B. Simane, and G. Eshete. 2016. "Factors Affecting Households' Decisions in Biogas Technology Adoption, the Case of Ofra and Mecha Districts, Northern Ethiopia." *Renewable Energy* 93: 215–227. <https://doi.org/10.1016/j.renene.2016.02.066>.
- Gurley, L. E. 2018. "Educators' Preparation to Teach, Perceived Teaching Presence, and Perceived Teaching Presence Behaviors in Blended and Online Learning Environments." *Online Learning Journal* 22, no. 2: 197–220. <https://doi.org/10.24059/olj.v22i2.1255>.
- Inda-Caro, M., R. Maulana, C. M. Fernández-García, et al. 2019. "Validating a Model of Effective Teaching Behaviour and Student Engagement: Perspectives From Spanish Students." *Learning Environments Research* 22, no. 2: 229–251. <https://doi.org/10.1007/s10984-018-9275-z>.
- Jabaar, S. O. 2018. "Teaching Styles and Educational Philosophies of Secondary School Teachers in Kano Metropolis, Nigeria." *African Journal of Teacher Education* 7, no. 3: 37–49. <https://doi.org/10.21083/ajote.v7i3.4333>.
- Kennan, S., P. Bigatel, S. Stockdale, and J. Hoewe. 2018. "The (Lack of) Influence of Age and Class Standing on Preferred Teaching Behaviors for Online Students." *Online Learning Journal* 22, no. 1: 163–181. <https://doi.org/10.24059/olj.v22i1.1086>.
- König, J., M. Krepf, A. Bremerich-Vos, and C. Buchholtz. 2021. "Meeting Cognitive Demands of Lesson Planning: Introducing the CODE-PLAN Model to Describe and Analyze Teachers' Planning Competence." *Teacher Educator* 56, no. 4: 466–487. <https://doi.org/10.1080/08878730.2021.1938324>.
- Kugler, A. D., C. H. Tinsley, and O. Ukhaneva. 2021. "Choice of Majors: Are Women Really Different From Men?" *Economics of Education Review* 81: 102079. <https://doi.org/10.1016/j.econedurev.2021.102079>.
- Laabidi, H. 2016. "The Effect of Age on English Professors' Integration of the New Technologies in Teaching." *Indonesian Journal of English Language Teaching and Applied* 1, no. 1: 63. <https://doi.org/10.21093/ijeltal.v1i1.11>.
- Lee, S. W., and E. A. Lee. 2020. "Teacher Qualification Matters: The Association Between Cumulative Teacher Qualification and Students' Educational Attainment." *International Journal of Educational Development* 77: 102218. <https://doi.org/10.1016/j.ijedudev.2020.102218>.
- Lestari, F. D., and H. Ubaidillah. 2022. "The Influence of Internship Experience, Motivation, and Academic Achievement on Students' Readiness in Entering the World of Work With Self Efficacy as a Moderating Variable (Study on Management Students at Muhammadiyah University of Sidoarjo)." *Journal of Islamic and Muhammadiyah Studies* 3: 1–20. <https://doi.org/10.21070/jims.v3i0.1565>.
- Lin, Y., and K. A. Magnuson. 2018. "Early Childhood Research Quarterly Classroom Quality and Children's Academic Skills in Child Care Centers: Understanding the Role of Teacher Qualifications." *Early Childhood Research Quarterly* 42: 215–227. <https://doi.org/10.1016/j.ecresq.2017.10.003>.
- Lindqvist, A., M. G. Sendén, E. A. Renström, et al. 2021. "What Is Gender, Anyway: A Review of the Options for Operationalising Gender Gender." *Psychology & Sexuality* 12, no. 4: 332–344. <https://doi.org/10.1080/19419899.2020.1729844>.
- Manning, M., S. Garvis, C. Fleming, and G. T. W. Wong. 2017. "The Relationship Between Teacher Qualification and the Quality of the Early Childhood Education and Care Environment." *Campbell Collaboration* 13: 1–82. <https://doi.org/10.4073/csr.2017.1>.
- Mullet, E., and G. Chasseigne. 2017. "Assessing Information Integration Processes: A Comparison of Findings Obtained With Between-Subjects Designs Versus Within-Subjects Designs." *Quality & Quantity: International Journal of Methodology* 52: 1977–1988. <https://doi.org/10.1007/s11135-017-0592-6>.
- Musafiri, C. M., M. Kiboi, J. Macharia, et al. 2022. "Adoption of Climate-Smart Agricultural Practices Among Smallholder Farmers in Western Kenya: Do Socioeconomic, Institutional, and Biophysical Factors Matter?" *Heliyon* 8, no. 1: e08677. <https://doi.org/10.1016/j.heliyon.2021.e08677>.
- Musau, L. M., and M. J. Abere. 2015. "Teacher Qualification and Students' Academic Performance in Science Mathematics and Technology Subjects in Kenya." *International Journal of Educational Administration and Policy Studies Full* 7, no. 3: 83–89. <https://doi.org/10.5897/IJEAPS2014.0386>.
- Nagro, S. A., D. W. Fraser, and S. D. Hooks. 2019. "Lesson Planning With Engagement in Mind: Proactive Classroom Management Strategies for Curriculum Instruction." *Intervention in School and Clinic* 54, no. 3: 131–140. <https://doi.org/10.1177/1053451218767905>.
- Ngichio, D. O., S. Karuku, and M. King. 2020. "Manifestations and Meanings of Cognitive Conflict Among Mathematics Students in Embu, Kenya." *Educational Research and Reviews* 15, no. 11: 690–699. <https://doi.org/10.5897/ERR2020.4061>.
- Nzomo, C. M., P. Rugano, J. Mungai, and C. M. Gitonga. 2023. "Inquiry-Based Learning and Students' Self-Efficacy in Chemistry Among Secondary Schools in Kenya." *Heliyon* 9, no. 1: e12672. <https://doi.org/10.1016/j.heliyon.2022.e12672>.
- Nzomo, C. M., P. Rugano, and J. M. Njoroge. 2023. "Relationship Between Inquiry-Based Learning and Students' Attitudes Towards Chemistry." *International Journal of Evaluation and Research in Education (IJERE)* 12, no. 2: 991–997. <https://doi.org/10.11591/ijere.v12i2.24165>.
- Podolsky, A., T. Kini, and L. Darling-hammond. 2019. "Does Teaching Experience Increase Teacher Effectiveness? A Review of US Research." *Journal of Professional Capital and Community* 4, no. 4: 286–308. <https://doi.org/10.1108/JPCCC-12-2018-0032>.
- Purnomo, M. V., B. Perizade, and Y. Syapril. 2023. "The Effect of Training and Work Experience on Performance With Competence as an Intervening Variable at the Head of the Technical Implementation Unit

- of PT. Indonesian Railways." *International Journal of Social Service and Research* 3, no. 8: 2054–2068. <https://doi.org/10.46799/ijssr.v3i8.499>.
- Rahida Aini, M. I., A. Rozita, and A. Zakaria. 2018. "Can Teachers' Age and Experience Influence Teacher Effectiveness in HOTS?" *International Journal of Advanced Studies in Social Science & Innovation* 2, no. 1: 144–158. <https://doi.org/10.30690/ijassi.21.11>.
- Rivaldo, Y., and S. D. Nabella. 2023. "Employee Performance: Education, Training, Experience and Work Discipline." *Quality—Access to Success* 24, no. 193: 182–188. <https://doi.org/10.47750/QAS/24.193.20>.
- Rusilowati, U., and W. Wahyudi. 2020. "The Significance of Educator Certification in Developing Pedagogy, Personality, Social and Professional Competencies." *Advances in Social Science, Education and Humanities Research* 409: 446–451.
- Saoke, V., Z. N. Okoth Ndwiga, P. W. Githaiga, and C. M. Musafiri. 2022. "Determinants of Awareness and Implementation of Five-Stage Lesson Plan Framework Among Christian Religious Education Teachers in Meru County." *Heliyon* 8: e11177. <https://doi.org/10.1016/j.heliyon.2022.e11177>.
- Saoke, V. O., C. M. Musafiri, Z. N. Ndwiga, and P. W. Githaiga. 2023. "The Christian Religious Education Teachers' Attitudes Toward the Five-Stage Lesson Plan Framework in Kenya: A Gender-Based Analysis." *Heliyon* 9, no. 8: e19104. <https://doi.org/10.1016/j.heliyon.2023.e19104>.
- Schmid, M., E. Brianza, and D. Petko. 2021. "Computers in Human Behavior Self-Reported Technological Pedagogical Content Knowledge (TPACK) of Pre-Service Teachers in Relation to Digital Technology Use in Lesson Plans." *Computers in Human Behavior* 115: 106586. <https://doi.org/10.1016/j.chb.2020.106586>.
- Shirawia, N., R. Alali, Y. Wardat, M. A. Tashtoush, S. Saleh, and M. Helali. 2023. "Logical Mathematical Intelligence and Its Impact on the Academic Achievement for Pre-Service Math Teachers." *Journal of Educational and Social Research* 13, no. 6: 239–254. <https://doi.org/10.36941/jesr-2023-0161>.
- Shrestha, N. 2020. "Detecting Multicollinearity in Regression Analysis." *American Journal of Applied Mathematics and Statistics* 8, no. 2: 39–42. <https://doi.org/10.12691/ajams-8-2-1>.
- Sims, S., and H. Fletcher-Wood. 2021. "Identifying the Characteristics of Effective Teacher Professional Development: A Critical Review." *An International Journal of Research, Policy and Practice* 32, no. 1: 47–63. <https://doi.org/10.1080/09243453.2020.1772841>.
- Susanti, A., R. A. A. Soemitro, H. Suprayitno, and V. Ratnasari. 2019. "Searching the Appropriate Minimum Sample Size Calculation Method for Commuter Train Passenger Travel Behavior Survey." *Journal of Infrastructure & Facility Asset Management* 1, no. 1: 47–60. <https://doi.org/10.12962/jifam.v1i1.5232>.
- Tran, T. T. T., and T. X. Do. 2022. "Student Evaluation of Teaching: Do Teacher Age, Seniority, Gender, and Qualification Matter?" *Educational Studies* 48, no. 4: 443–470. <https://doi.org/10.1080/03055698.2020.1771545>.
- Voor In 't Holt, A. F. 2019. "Age: A Variable Whose Definition We Should Not Ignore." *Infection Control and Hospital Epidemiology* 40, no. 12: 1444–1445. <https://doi.org/10.1017/ice.2019.271>.
- White, L. J., H. W. McGowan, and A. C. McDonald. 2019. "The Effect of Content Delivery Style on Student Performance in Anatomy." *Anatomical Sciences Education* 12, no. 1: 43–51. <https://doi.org/10.1002/ase.1787>.
- Yin, J., J. Yuan, N. Arfaei, P. J. Catalano, J. G. Allen, and J. D. Spengler. 2020. "Effects of Biophilic Indoor Environment on Stress and Anxiety Recovery: A Between-Subjects Experiment in Virtual Reality." *Environment International* 136: 105427. <https://doi.org/10.1016/j.envint.2019.105427>.
- Yu, J., P. Kreijkes, and K. Salmela-Aro. 2022. "Students' Growth Mindset: Relation to Teacher Beliefs, Teaching Practices, and School Climate." *Learning and Instruction* 80: 101616. <https://doi.org/10.1016/j.learninstruc.2022.101616>.
- Yuan, Q., H. Zhou, J. Li, Z. Liu, F. Yang, and X. S. Shen. 2018. "Toward Efficient Content Delivery for Automated Driving Services: An Edge Computing Solution." *IEEE Network* 32: 80–86. <https://doi.org/10.1109/MNET.2018.1700105>.
- Zangirolami-raimundo, J., and J. de Oliveira. 2018. "Research Methodology Topics: Cross-Sectional Studies." *Journal of Human Growth and Development* 28, no. 3: 356–360. <https://doi.org/10.7322/jhgd.152198>.