The Alignment of Lesson Plans with The Curriculum for Science Student Teachers During School Experience: A Case Study of Mukuba University, Zambia

Abstract

This study investigates the alignment of lesson plans with the prescribed curriculum, teaching methods, and assessment practices employed by student teachers during their school experience. It aims to bridge the gap between curriculum design and practical implementation by examining how effectively student teachers apply the curriculum, the challenges they face, and the extent to which their teaching methods and assessments align with intended educational outcomes. A mixed-methods approach was adopted, combining qualitative data from focus group discussions and semi-structured interviews with quantitative analysis of lesson plans and classroom observations. The findings revealed a persistent misalignment between prescribed syllabus topics and those planned in lesson plans. Teaching methods were predominantly teacher-centered, with limited use of learner-centered approaches such as group work, debates, and field trips. Assessment practices were primarily summative, with little emphasis on formative assessments, contradicting the curriculum's focus on continuous student evaluation. The exam-centric approach led to rote learning and minimal active student participation. Qualitative data indicated that factors such as limited resources, inadequate mentorship, and insufficient professional development opportunities contributed to these challenges. The study recommends strengthening teacher training programs by emphasizing curriculum interpretation, adopting learner-centered teaching methods, and incorporating diverse formative assessments. Additionally, greater resource allocation and targeted mentorship are necessary to shift from exam-driven teaching to fostering meaningful learning experiences. These findings provide actionable insights to enhance teacher preparedness and create more effective teaching and learning environments.

Keywords: curriculum alignment, student teachers, teaching methods, learner-centered teaching, formative assessment, summative assessment.

1. INTRODUCTION

The alignment of lesson plans with the curriculum forms the foundation of effective science education, particularly in preparing students to grasp complex and abstract scientific concepts. Education plays a pivotal role in fostering societal and technological advancements, with science education being central to equipping learners with the critical thinking and problem-solving skills needed to address global challenges (Chen et al.,2022). Disciplines such as physics, nutrition science, chemistry, and biology enable students to grasp complex concepts and apply scientific principles to real-world situations. However, for science education to be effective, lesson plans must align seamlessly with curriculum objectives, as this ensures a logical and coherent structure for delivering essential content. Misalignment risks undermining students' mastery of scientific concepts and their ability to develop the innovative skills required to address pressing challenges, including climate change, public health crises, and food insecurity.

Globally, educational systems acknowledge that aligning lesson plans with curriculum frameworks is essential for maintaining high teaching standards and achieving desirable learning outcomes. The United Nations Sustainable Development Goals (SDGs), particularly Goal 4 on inclusive and equitable quality education and Goal 9 on fostering innovation through education, emphasize the strategic role of well-structured educational practices. Recent research by Chen et al. (2022) indicates that effective curriculum alignment significantly enhances student engagement, fosters better academic performance, and strengthens the connection between classroom learning and real-world applications. Furthermore, the integration of digital tools has emerged as a key factor in lesson planning, enabling educators to align their teaching methods with evolving educational demands (Smith & Lee, 2021).

Effective curriculum alignment is particularly critical in science education, where students must grasp abstract concepts and engage in inquiry-based learning. Learner-centered approaches, as highlighted by Mwangi and Thuku (2022), are increasingly recognized for their potential to transform science education by promoting critical thinking and fostering lifelong learning. However, achieving such alignment requires substantial teacher training and resource support, especially in regions facing educational resource constraints.

In many African countries, challenges related to curriculum alignment remain persistent. These include limited teacher training, fragmented curriculum implementation, and inadequate access to teaching aids. According to Okonkwo and Adebayo (2021), systemic barriers have hindered efforts to fully integrate learner-centered and inquiry-based teaching strategies. Despite these challenges, there have been notable advancements in teacher education programs, driven by the adoption of digital learning technologies and hybrid teaching models post-COVID-19. Studies such as Mwangi and Thuku (2022) document how African educational systems are increasingly leveraging digital tools to address alignment challenges and improve lesson delivery. Effective science education is widely recognized as a catalyst for socioeconomic development across Africa, with significant potential to address key challenges such as environmental degradation, public health crises, and technological innovation. However, Muthwii and Ngatia (2016) argue that many teachers struggle to interpret and implement curricula due to insufficient training and resource limitations, leading to fragmented lesson delivery and uneven student performance. Addressing these challenges requires comprehensive teacher education programs, mentorship, and capacity-building initiatives.

Zambia's Revised Curriculum Framework (Ministry of General Education, 2014) underscores the importance of integrating scientific knowledge and practical skills to prepare learners for both national and global challenges. Science education is positioned as a strategic pillar for national development, given its potential to foster innovation, environmental stewardship, and technological advancements. However, despite these aspirations, science student teachers in Zambia face numerous challenges in aligning their lesson plans with the curriculum during their school experience. Key challenges include adapting to diverse classroom environments, effectively utilizing laboratory resources, and addressing varying levels of student preparedness. Ngoma et al. (2021) highlight the persistent gaps in teacher training and resource allocation, which hinder effective curriculum implementation. Furthermore, limited mentorship opportunities during school experience exacerbate these challenges, leaving student teachers ill-equipped to navigate complex teaching environments. The Zambia National Education Coalition (2023) has called for increased investment in teacher training and professional development to address these issues.

Mukuba University, Zambia's leading institution for training science teachers, plays a critical role in preparing student teachers for practical teaching. However, ensuring that student teachers align their lesson plans with the national curriculum remains a significant challenge. Robust training

programs, mentorship frameworks, and resource support are essential to bridge the gap between theoretical learning and practical application.

This study investigates the practices and challenges of aligning lesson plans with the curriculum for science student teachers at Mukuba University during their school experience. Specifically, it explores teaching methods, assessment strategies, and the barriers encountered in aligning lesson plans with curriculum objectives. The findings aim to provide actionable recommendations for improving teacher training programs and curriculum implementation. The relevance of this study extends beyond Zambia, contributing to global efforts to enhance teacher preparedness and educational quality.

2. LITERATURE REVIEW

The alignment of lesson plans with curriculum objectives is a central theme in teacher education, as it profoundly impacts teaching effectiveness and student learning outcomes. Ensuring that lesson plans align with curriculum standards is crucial for fostering coherent, goal-oriented instruction. This review synthesizes existing literature on the alignment of lesson plans with curriculum objectives, focusing specifically on science student teachers during their school experience placements. The review explores global perspectives, emphasizes the African and Zambian contexts, identifies gaps in the literature, and justifies the need for further research.

2.1 Global Perspective on Curriculum Alignment

The significance of curriculum alignment in enhancing educational quality is well-established in educational research. Recent studies, such as Johnson et al. (2022), highlight that alignment ensures consistency across educational standards, instructional methods, and assessments, ultimately improving student outcomes. In science education, aligning lesson plans with curriculum objectives is vital for promoting scientific literacy and preparing students for real-world problem-solving. However, while the global literature underscores the importance of curriculum alignment, practical implementation challenges persist. Teachers often struggle to align their teaching practices with curriculum frameworks due to limited resources, inadequate professional development, and a lack of effective mentorship (Smith & Nguyen, 2021). Recent

research emphasizes the importance of employing inquiry-based and hands-on teaching strategies that engage students and promote critical thinking (Taylor & White, 2023).

2.2 Curriculum Alignment in the African Context

In Africa, curriculum alignment has been a key focus of educational reforms, particularly as countries strive to achieve the goals of Education for All (EFA) and Sustainable Development Goal 4 (SDG 4). Recent studies (Ndlovu & Dlamini, 2023) reveal persistent challenges, including insufficient teacher training and resource limitations that hinder effective curriculum implementation. In Kenya and South Africa, teacher education programs have faced difficulties in preparing student teachers to align their lesson plans with curriculum standards. Mutua and Otieno (2022) found that inadequate mentorship and large class sizes negatively impact the ability of student teachers to implement aligned lesson plans.

2.3 Curriculum Alignment in Zambia

The Revised Curriculum Framework (Ministry of General Education, 2014) in Zambia introduced a new approach emphasizing inquiry-based, hands-on learning and critical thinking, particularly in science subjects. The framework aims to foster student-centered learning, where students actively construct knowledge rather than passively receiving information. While the shift in educational philosophy is commendable, recent studies highlight persistent challenges. Chibwe and Phiri (2022) found that student teachers in Zambia often struggle to align their lesson plans with curriculum objectives due to limited practical teaching experience and insufficient guidance from mentor teachers. These challenges are compounded by large class sizes and a lack of modern teaching resources (Mwansa & Banda, 2021).

2.4 The Role of Teacher Education in Curriculum Alignment

Effective teacher education is essential for ensuring that student teachers can align their lesson plans with curriculum standards. Recent research (Kabwe & Tembo, 2023) emphasizes that teacher education programs must focus on both subject matter knowledge and pedagogical skills that enable student teachers to integrate curriculum objectives into their teaching practices. In the context of science education, this involves equipping student teachers with theoretical knowledge and practical tools to design and deliver effective science lessons. However, teacher education

programs in Zambia continue to face resource constraints, inadequate mentorship, and limited opportunities for continuous professional development (Mumba & Chilufya, 2022).

2.5 Gaps in Existing Literature

While the literature on curriculum alignment is extensive, notable gaps remain, particularly concerning the alignment of lesson plans in science education within the African and Zambian contexts. Most studies focus on general curriculum alignment across subjects or on teacher education in high-income countries, with limited attention to the specific challenges faced by science student teachers in sub-Saharan Africa. Existing research has largely neglected the role of mentorship and support systems in assisting student teachers with curriculum alignment. Recent studies (Chilando, 2023) highlight the need for in-depth exploration of the pedagogical methods and assessment practices used by student teachers in science education and the challenges they encounter in aligning their lesson plans with the curriculum. Given these gaps, there is a clear need for further research on the alignment of lesson plans with the curriculum in science teacher education programs in Zambia. This study aims to address these gaps by examining the experiences of science student teachers during their school experience placements at Mukuba University. By focusing on teaching methods, assessment practices, and challenges, this research will contribute to a more nuanced understanding of curriculum alignment in practice.

3. METHODOLOGY

This research used a mixed-methods approach, incorporating both quantitative and qualitative data collection techniques. This approach was designed to comprehensively address the study's objectives, which included examining teaching methods, assessment practices, and the challenges faced in curriculum alignment.

3.1 Research Design

A case study design was adopted to allow for an in-depth exploration of the phenomenon within its real-life context. This design was particularly suited to the research objectives as it enabled a detailed understanding of how student teachers interpreted and implemented the curriculum

through lesson planning. According to Yin (2018), case studies are ideal for investigating complex issues where the boundaries between the phenomenon and the context are not clearly defined. In this study, the case of Mukuba University served as a microcosm for examining curriculum alignment challenges and practices in teacher education.

3.2 Population and Sampling

The study targeted 220 science student teachers who had completed their school experience placements during the 2023 academic year. These student teachers represented a diverse population, having been placed in various schools across Zambia, each with unique teaching contexts and challenges. The diversity within the population allowed for a rich exploration of factors influencing curriculum alignment.

A sample of 50 student teachers was selected using purposive sampling. This sampling method ensured that participants with the most relevant experiences and insights were included in the study. The sample represented a range of placement schools, teaching environments, and individual backgrounds, ensuring the findings reflected a broad spectrum of challenges and practices. Additionally, 10 mentor teachers from placement schools were included in the study to provide an external perspective on the student teachers' lesson planning and curriculum alignment.

3.3 Data Collection Methods

To ensure a comprehensive and reliable analysis of the alignment between the lesson plans and the prescribed curriculum, the study employed multiple data collection methods. These methods were designed to capture both quantitative and qualitative data, which provided a well-rounded understanding of the challenges and practices of the student teachers.

3.3.1 Lesson Plan Analysis

The study began with a detailed analysis of 250 lesson plans, which were prepared by 50 sampled student teachers. These lesson plans were scrutinized to assess how closely they adhered to the Zambian science curriculum. Several key components were examined in the analysis, including the clarity and specificity of the learning objectives, the instructional strategies employed, the

integration of inquiry-based methods, and the alignment with assessment requirements. The lesson plan analysis aimed to identify whether the student teachers' plans reflected the prescribed curriculum's intended outcomes, methods, and content. This step was crucial in understanding the extent to which the lesson plans were consistent with the curriculum guidelines and how effectively they addressed the learning objectives.

3.3.2 Questionnaires

Structured questionnaires were administered to all 50 student teachers. These questionnaires were designed to gather quantitative data on the participants' perceptions of curriculum alignment, teaching methods, and the challenges they faced while implementing the curriculum. The questionnaire included a mix of closed-ended Likert-scale items, which allowed for the quantification of responses related to various aspects of teaching practice. Additionally, open-ended questions were included to capture the students' personal insights and reflections on their experiences. The responses provided valuable information regarding the student teachers' attitudes towards curriculum alignment and the practical barriers they encountered, such as time constraints, lack of resources, and difficulties in integrating certain teaching methods.

3.3.3 Focus Group Discussions

In addition to the questionnaires, three focus group discussions were conducted, each consisting of 10–12 student teachers. The purpose of these discussions was to provide a platform for participants to collectively share their experiences, challenges, and strategies related to curriculum alignment and lesson planning. The discussions were semi-structured, allowing for both guided explorations of specific themes and spontaneous contributions. This format enabled a rich, collaborative exchange of ideas and insights among the student teachers. The focus groups were instrumental in uncovering the common challenges faced by student teachers in interpreting and implementing the curriculum, as well as the coping mechanisms they employed. The qualitative data gathered from the focus groups helped to contextualize and deepen the understanding of the quantitative findings obtained through the questionnaires.

3.3.4 Semi-Structured Interviews

To gain a deeper understanding of the student teachers' experiences, in-depth interviews were conducted with 15 student teachers and 10 mentor teachers. These semi-structured interviews allowed for more nuanced exploration of the participants' views on lesson planning and curriculum implementation. The interviews focused on key issues such as how lesson plans were developed, the alignment between the planned lessons and the prescribed curriculum, and the challenges faced in maintaining curriculum fidelity. The flexibility of the semi-structured format enabled the interviewer to probe specific areas of interest based on the interviewees' responses. The interviews were audio-recorded, transcribed, and analyzed to identify recurring themes and patterns in the participants' experiences. These qualitative insights provided a richer understanding of the contextual factors influencing curriculum alignment, including mentorship practices, resource availability, and individual teacher beliefs.

3.3.5 Document Review

Lastly, the study involved a review of several relevant documents, including curriculum guides, placement guidelines, and feedback reports from mentor teachers. This document review helped provide additional context to the findings, offering insight into the official standards, expectations, and regulations that govern lesson planning for student teachers. The documents provided essential background information on the curriculum's structure and objectives, as well as on the mentorship process. They also helped to clarify the expectations placed on the student teachers and the types of feedback they received from their mentors. By cross-referencing the findings from the document review with the data obtained from the other methods, the study ensured that the analysis was grounded in the broader institutional and educational framework.

3.4 Data Analysis

Data analysis combined quantitative and qualitative approaches to ensure a holistic interpretation of the findings. Quantitative data from the questionnaires were analyzed using descriptive and inferential statistics. Frequencies, percentages, and mean scores were used to summarize the responses, while statistical tests such as chi-square and t-tests were employed to identify significant relationships or differences among variables.

Qualitative data from focus group discussions, interviews, and document reviews were analyzed using thematic analysis. Following Braun and Clarke's (2006) framework, the data were coded to identify recurring themes and patterns. These themes were categorized into three main areas: teaching methods, assessment practices, and challenges in curriculum alignment. The integration of quantitative and qualitative data provided a comprehensive understanding of the research problem.

2. Result:

This section summarizes the findings of the study on the alignment between the lesson plans prepared by student teachers and the content prescribed in the syllabus.

4.1 Alignment of Lesson Plans with Syllabus Content

Table 1: Alignment of Lesson Plans with Syllabus Content

Alignment with Syllabus	Frequency	Percentage
Fully Aligned	12	24%
Partially Aligned	23	46%
Misaligned	15	30%

Table 1 reveals that the majority of student teachers (46%) produced lesson plans that were only partially aligned with the prescribed syllabus. Additionally, 30% created lesson plans that were significantly misaligned, while just 24% fully aligned their lesson plans with the syllabus. These findings were supported by qualitative data. For example, one teacher stated:

> *Sometimes, I skip certain topics from the syllabus because I feel like they aren't necessary for the students to understand the basics. I make changes based on what I think is most relevant.* (Teacher 1, Interview, 2023)

This statement directly reflects the misalignment seen in the data. Teacher 1's decision to omit certain topics without considering their importance in the syllabus contributes to the significant number of lesson plans being misaligned. Another teacher substantiated by stated:

I try to cover everything in the syllabus, but some topics are too complicated for the time I have. I do my best to teach what I think will be on the exam. (Teacher 2, Interview, 2023).

The above shows that this teacher's focus on teaching what is deemed most relevant for exams explains the partial alignment observed in the data. Although most topics are covered, the emphasis on exam content causes certain topics to be deprioritized.

4.2 Teaching Methods Used by Student Teachers

The findings on the methods presents the frequency of various teaching methods used by student teachers and compares them with those prescribed in the syllabus as detailed in table 2.

*Table 2: Uses of Various Teaching Methods by Student Teache***rs**

Teaching Method	Frequency	Percentage
Teacher Exposition (Lecture)	30	60%
Group Work	8	16%
Field Trips	4	8%
Debates	3	6%
Case Study Analysis	5	10%

Table 2 shows that majority of student teachers (60%) used Teacher Exposition (Lecture) as their primary teaching method, which is a traditional, teacher-centered approach. Group Work (16%), Field Trips (8%), and Debates (6%) were used infrequently, despite being prescribed in the syllabus as essential methods for fostering active, learner-centered engagement. The above findings were supported by qualitative data from the interviews. For example, a teacher stated:

I prefer lectures because they are efficient and allow me to cover a lot of content quickly. Group work can be chaotic, and I'm not sure how to manage it effectively. (Teacher 1, interview, 2023).

Teacher 1's comment directly reflects the data, showing a clear preference for teacher-centered methods due to perceived efficiency and control over the classroom. Similar sentiments were shared by another teacher:

I would love to organize field trips or debates, but there are always logistical issues—getting permission, arranging transport—it's just too much. I focus on lectures because it's straightforward. (Teacher 2, interview, 2024)

This teacher's explanation of logistical challenges reinforces the low usage of methods like Field Trips (8%) and Debates (6%), which require additional planning and resources, often unavailable to student teachers. The above findings are in line with qualitative data from the interviews and Focus Group Discussions (FGDs). A focus group discussion revealed:

Group work is helpful for deeper understanding, but I'm always unsure of how much of the syllabus I can cover if I focus too much on it. It's a balancing act. (FGD, 2024)

The above response highlights the challenge of balancing interactive teaching methods with the pressure to cover syllabus content, explaining why Group Work is underused despite its advocacy in the syllabus.

4.3 Assessment Methods Used by Student Teachers

The findings on the assessments details the frequency of different assessment methods employed by student teachers and compares them with the assessment methods prescribed in the syllabus as detailed in table 3.

Table 3:Uses of Various Assessment as a Teaching Methods by Student Teachers

Assessment Method	Frequency	Percentage
Summative Assessment (Exams)	40	80%
Formative Assessment (Homework, Quizzes)	8	16%
Peer Assessment	2	4%

Table 3 show s that student teachers mainly use Summative Assessments (80%) is observed, particularly exams, which are frequently used to assess student learning. Formative assessments (16%) and Peer Assessments (4%) were used infrequently, despite being recommended in the

syllabus to encourage continuous feedback and active learning. The qualitative data also revealed similar results. A teacher stated:

I mostly give exams because that's the easiest way to measure their progress. I don't have time to grade quizzes or assignments regularly. (FGD, 2023).

The above statement shows teachers' focus on exams as the main assessment tool directly correlates with the high frequency of summative assessments in the data. This teacher values the efficiency of exams over the ongoing feedback that formative assessments would provide. The foregoing was substantiated by another teacher who stated:

I know quizzes and homework are important, but I'm under pressure to finish the syllabus. It's hard to balance continuous assessment with all the content I need to cover. (FGDs, 2024).

The above statement emphasizes the challenge of balancing formative assessments with the need to cover the syllabus content, which likely contributes to the underutilization of **Formative Assessments** in favor of more traditional summative assessments. Another teacher substantiated by stating that:

I don't really use peer assessments because I don't trust that the students will give accurate feedback. It feels like extra work for me. (FGDs, 2024)

The comment above clarifies why Peer Assessments (4%) are rarely used, pointing to a lack of confidence in students' ability to provide constructive feedback, as well as an additional workload for the teacher.

3. DISCUSSION

This section critically examines the findings regarding the challenges faced by student teachers in aligning their lesson plans, teaching methods, and assessments with the prescribed curriculum. The key issues identified in the study revolve around the misalignment between lesson plans and the syllabus, overreliance on teacher-centered methods, and limited use of formative and peer assessments.

5.1 Misalignment Between Lesson Plans and Syllabus

The misalignment between lesson plans and the prescribed syllabus is a widely documented challenge in education. In a study conducted by Alshammari (2021), the author noted that teachers, especially novice ones, tend to focus their lesson planning on preparing students for high-stakes exams, neglecting other broader curricular goals. This is consistent with Madaus and Russell's (2009) earlier findings, where the focus on exam results leads teachers to simplify or omit some syllabus content in favour of content perceived as more exam-relevant. The findings of Alshammari (2021) are further supported by a study by García-Peñalvo et al. (2021), who suggest that the pressures of standardized assessments in the educational system reduce the opportunity for deeper, reflective teaching practices, which are crucial for fulfilling the holistic objectives of a curriculum. Reflective practice, as proposed by Schön (1983), remains an essential tool for student teachers to address this misalignment. Recent studies have supported the idea that reflective practice enhances curriculum alignment by encouraging teachers to think critically about their teaching decisions and the broader educational goals (Vellani, 2020). This highlights the importance of teacher preparation programs integrating reflective practices as a key component of their training. Vellani (2020) argues that by engaging in self-reflection, student teachers can recognize the need to align their lesson planning with the entire syllabus, not just exam-oriented content.

5.2 Overreliance on Teacher-Centred Methods

The overreliance on teacher-centred methods is another persistent challenge in many educational contexts. Research by Liu and Zhang (2021) found that despite curriculum reforms advocating for learner-centered approaches, new teachers often continue to use traditional teacher-centred methods such as lectures and direct instruction. These methods, while efficient for delivering content, have been criticized for not promoting deeper engagement or critical thinking (Vavrus et al., 2011). Bandura's (1997) theory of self-efficacy explains this behaviour, suggesting that student teachers may resort to these traditional methods because they feel more confident in their ability to manage the classroom and maintain control. Further research has examined the persistence of teacher-centered methods despite growing support for active learning. A study by Givens and Poole (2022) showed that teachers, particularly those in their early careers, rely on traditional methods due to lack of experience and confidence in managing more interactive learning activities.

This reliance is also linked to the challenges posed by large class sizes and insufficient resources, which make it difficult to implement learner-centred strategies (Mustafa & Akbarzadeh, 2023).

5.3 Limited Use of Formative and Peer Assessments

The limited use of formative and peer assessments in teacher education programs is a significant issue that hinders the development of effective teaching practices. Recent studies have highlighted that while formative assessments are a powerful tool for enhancing student learning, they are underutilized, primarily due to the overwhelming focus on summative assessments. Anwar and Yadav (2020) found that teachers, including student teachers, often rely heavily on summative assessments, such as final exams, due to the high-stakes nature of these evaluations. The pressure to cover the entire syllabus and prepare students for exams contributes to the neglect of formative assessment techniques. Heritage (2010) underscores the importance of formative assessments in supporting student learning, as they allow teachers to provide ongoing feedback that can guide future instruction. However, as pointed out by Elsayed and Nawaz (2023), implementing formative assessments requires a shift in mindset, as well as time and resources, which may not be available in fast-paced educational environments. The underuse of peer assessments is similarly a result of concerns over the reliability and effectiveness of peer feedback, particularly when student teachers lack adequate training in facilitating these processes (Arshad et al., 2019).

4. Conclusion

The challenges of misalignment between lesson plans and the syllabus, overreliance on teacher-centered methods, and limited use of formative and peer assessments are not only prevalent in the current study but have also been documented extensively in recent research. Addressing these issues requires comprehensive teacher preparation programs that emphasize reflective practice, self-efficacy development, and the integration of varied assessment methods. The studies referenced above underscore the importance of overcoming these challenges to ensure that student teachers are adequately prepared to meet the demands of the curriculum and foster an engaging, student-centered learning environment. In focusing on these areas, teacher education programs can better equip student teachers with the skills and confidence necessary to implement effective and

holistic teaching practices. These efforts are crucial for improving the quality of education and ensuring that teachers are able to meet the diverse needs of their students.

Ethical Approval and Consent:

Ethical approval for the study was obtained from Mukuba University's institutional review board. All participants provided informed consent, ensuring they were fully aware of the study's purpose, procedures, and their right to withdraw at any time without penalty. Confidentiality and anonymity were maintained throughout the research process by anonymizing participant responses and securely storing data. Additionally, the study adhered to ethical guidelines by respecting participants' privacy and ensuring that no harm came to them as a result of their involvement.

Disclaimer (Artificial Intelligence)

Option 2:
The authors confirm that this manuscript was written entirely by them. AI tools were only used to enhance grammar, style, and research clarity. Details are as follows:

1. **Grammarly:** for grammar and clarity suggestions.
2. **Quillbot:** for refining sentence structure.
3. **Consensus:** for accessing research insights.

These tools supported language improvement and research efficiency without compromising the authors' original contributions.

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