

## **The Authentic Teacher in the Age of Artificiality: Fostering Sustainable Teaching Effectiveness through Enhanced Microteaching Processes**

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### **Abstract**

*In an era increasingly shaped by artificial intelligence and digital technologies, authentic teaching remains vital for fostering meaningful, human-centered learning experiences. This study investigated how enhanced microteaching processes that emphasize reflective practice, iterative feedback, and adaptive instructional strategies contribute to sustainable teaching effectiveness among pre-service teachers. Using a mixed-methods design, data were collected from 133 pre-service science teachers across three Colleges of Education in Southwestern Nigeria. Quantitative results revealed significant improvements in reflective practice (pre-test  $M = 3.42$ , post-test  $M = 4.21$ ) and teaching effectiveness (pre-test  $M = 3.56$ , post-test  $M = 4.28$ ). Reflective practice was the strongest predictor of teaching effectiveness ( $\beta = .48$ ,  $p < .001$ ), followed by iterative feedback ( $\beta = .31$ ,  $p < .01$ ) and adaptive strategies ( $\beta = .22$ ,  $p < .05$ ), accounting for 69 percent of the variance. Qualitative findings corroborated these results, showing that participants developed stronger pedagogical authenticity, greater instructional confidence, and increased adaptability through repeated cycles of reflection and feedback. Grounded in constructivist and experiential learning theories, the study concludes that enhanced microteaching promotes continuous professional growth and sustains authentic pedagogy amid technological change.*

**Keywords:** authentic teaching, microteaching, reflective practice, teaching effectiveness, experiential learning, sustainability

## 1. Introduction

The 21st-century classroom is increasingly mediated by digital tools and artificial intelligence (AI), redefining both instructional delivery and the teacher's professional identity. While AI offers efficiency, accessibility, and data-driven insights, it risks diminishing the humanistic dimension of teaching empathy, reflection, and relational engagement (Deng, 2023). Consequently, authenticity in teaching has become a critical counterbalance to technological determinism, preserving the moral and affective essence of education. As educational spaces become more technologically integrated, the authentic teacher serves as a stabilizing force ensuring that pedagogy remains humane, reflective, and contextually responsive.

Authenticity in teaching embodies the alignment of beliefs, values, and classroom practices. It involves genuine self-reflection, ethical awareness, and the ability to connect personally and intellectually with learners. Recent research highlights authenticity as a key predictor of sustained teacher motivation and student engagement (Korau, Aliyu, Ya'u, & Jika, 2024). Teachers who engage in reflective practices exhibit greater instructional confidence and moral integrity; qualities that foster trust, inclusivity, and empowerment in the learning environment (Daodu et al., 2024). Thus, authenticity transcends mere technique; it represents a commitment to relational and transformative pedagogy.

The proliferation of AI in education has created what may be termed a *paradox of artificiality*: while digital systems enhance efficiency, they may inadvertently suppress creativity, spontaneity, and emotional connection. As Bistu and Mangyvat (2024) note, technology-rich environments can prioritize performance metrics over genuine learning experiences. The challenge for educators, therefore, is not whether to use technology but how to integrate it meaningfully without compromising authenticity. Maintaining this balance requires deliberate reflection and adaptive pedagogy competencies best cultivated through enhanced microteaching.

Microteaching remains one of the most powerful strategies for developing instructional competence among pre-service teachers. It enables them to experiment, receive feedback, and reflect on their performance in controlled settings. Recent studies have underscored its value in promoting reflective self-assessment and professional growth (Omolere et al., 2025; James et al., 2024). Omolere and colleagues (2025) found that incorporating digital video into microteaching

fosters deeper reflection and improved instructional creativity. Similarly, James et al. (2024) demonstrated that microteaching combined with mentoring significantly enhances the pedagogical competence of student-teachers in Nigerian colleges of education. These findings affirm microteaching's role as a bridge between theory and authentic classroom practice.

This study draws upon constructivist and experiential learning theories to explain how teachers develop sustainable effectiveness. Constructivism emphasizes the co-construction of knowledge through active engagement and reflection (Deng, 2023), while experiential learning theory (Kolb, 1984) frames learning as a cyclical process of doing, reflecting, conceptualizing, and applying. Daodu et al. (2024) reaffirm that constructivist approaches especially problem-driven and collaborative learning enhance deep knowledge construction and long-term competence. Within this framework, enhanced microteaching becomes not merely a training exercise but a transformative learning cycle that reinforces authenticity and adaptability.

The primary aim of this study is to examine how enhanced microteaching processes contribute to sustainable teaching effectiveness among pre-service science teachers in Southwestern Nigeria. Specifically, it investigates how reflective practice, iterative feedback, and adaptive instructional strategies predict long-term pedagogical growth and authenticity. In line with recent African teacher education research (James et al., 2024; Bistu & Mangvwat, 2024), the study seeks to determine whether these enhancements can mitigate the erosion of human connection in AI-driven educational contexts. The central research question is: *How does enhanced microteaching foster authenticity and sustainability in teaching within an age dominated by artificiality?*

## **2. Theoretical Framework and Literature Review**

### **2.1 Conceptualizing Authentic Teaching in the Digital Age**

Authenticity in teaching refers to the alignment between a teacher's beliefs, values, and instructional practices in ways that promote genuine, ethical, and empathetic engagement with learners. Contemporary research situates authenticity as both a moral and pedagogical construct that emphasizes transparency, integrity, and human connection in the learning process (Korau, Aliyu, Ya'u, & Jika, 2024). Authentic teachers foster inclusive environments that value student voice and agency, creating relationships built on trust and mutual respect. These relational dynamics are increasingly threatened by the automation and depersonalization that accompany

technology-driven classrooms. As AI and digital platforms mediate more aspects of teaching, maintaining authenticity requires teachers to deliberately integrate technological tools while preserving the human element of learning (Deng, 2023).

The need for authenticity is heightened in contexts where teaching effectiveness is often measured by quantitative indicators such as test scores and performance metrics. Such indicators, though useful, may obscure the affective and reflective components of teaching that define genuine pedagogical engagement. Daodu, Elegbede, and Adedotun (2024) contend that 21st-century teaching must prioritize meaning-making and learner-centered dialogue over mechanistic content delivery. Authenticity, therefore, is not static but an evolving disposition that balances professional rigor with emotional intelligence.

## **2.2 Microteaching and Reflective Practice**

Microteaching serves as an essential bridge between theory and classroom practice by allowing pre-service teachers to practice specific teaching skills in a supportive environment. The process traditionally involves teaching short lessons to peers, receiving feedback, and reflecting on performance. Recent scholarship confirms that microteaching significantly enhances reflective practice and instructional adaptability (Omolere, Ebiseni, & Lucky, 2025; James, Uwannah, Egwuonwu, & Joshua, 2024). Omolere et al. (2025) demonstrated that integrating digital video analysis into microteaching encourages deeper reflection and self-assessment, while James et al. (2024) found that microteaching combined with mentoring improved pre-service teachers' professional confidence and competence.

Reflective practice is central to this process. It involves continuous self-evaluation, identification of strengths and weaknesses, and the application of insights to future lessons. Schön's (1983) idea of the "reflective practitioner" remains relevant, but new evidence from African and Asian contexts indicates that structured reflection within microteaching cycles cultivates long-term professional growth (Bistu & Mangyvat, 2024). Reflective microteaching allows teachers to connect personal teaching philosophies with classroom realities, enhancing their authenticity and instructional sustainability.

### **2.3 Iterative Feedback and Adaptive Pedagogy**

Feedback plays a pivotal role in transforming microteaching from a simple performance exercise into an iterative learning process. Constructive feedback from peers and supervisors enables pre-service teachers to identify specific areas for improvement and to adapt their approaches in subsequent teaching attempts. Recent evidence suggests that timely, dialogic feedback strengthens teacher agency and deepens metacognitive awareness (Omolere et al., 2025). This iterative feedback loop fosters adaptability, which is critical for teaching in rapidly changing educational contexts influenced by technological innovations.

Adaptive pedagogy refers to the teacher's ability to modify instructional strategies based on student diversity, context, and emerging challenges. In technologically mediated classrooms, adaptability ensures that digital tools are used purposefully rather than mechanically. Studies in Nigerian and international teacher education programs highlight that adaptability correlates positively with teaching confidence and learner engagement (James et al., 2024; Daodu et al., 2024). By embedding reflective feedback cycles within microteaching, teachers cultivate a mindset of continuous learning and professional flexibility.

### **2.4 Constructivist Theory as a Foundation for Teaching Authenticity**

Constructivism provides a theoretical basis for understanding how teachers and learners co-create knowledge. Rooted in the works of Piaget and Vygotsky, constructivism posits that knowledge is not transmitted but constructed through experience and social interaction. Deng (2023) affirmed that problem-driven and collaborative learning activities rooted in constructivist principles enhance students' engagement and deepen conceptual understanding. From a teacher-education standpoint, constructivism underscores the need for educators to design learning experiences that encourage exploration, questioning, and reflection.

In microteaching, constructivism manifests when pre-service teachers design lessons that actively involve learners in constructing meaning rather than passively receiving information. This approach aligns with Daodu et al. (2024), who emphasize that constructivist teaching encourages creativity and critical thinking by allowing learners to connect new knowledge with prior experience. The constructivist paradigm also supports authenticity, as teachers must adapt

instruction to students' backgrounds, interests, and contexts. Such adaptation reinforces the teacher's reflective engagement and responsiveness to learners' needs.

## **2.5 Experiential Learning Theory and Professional Growth**

Kolb's (1984) experiential learning model provides an additional framework for interpreting the impact of microteaching on teaching effectiveness. The model outlines a cyclical process comprising four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. In microteaching, these stages correspond respectively to classroom enactment, observation of performance, synthesis of feedback, and implementation of improved techniques. This cyclical model mirrors the process of professional learning, allowing teachers to convert experiences into enduring competencies.

Recent studies extend Kolb's framework by integrating digital technologies that enhance reflection and feedback. For instance, Omolere et al. (2025) demonstrated that video-assisted microteaching helps pre-service teachers visualize their teaching behaviors and identify subtle nonverbal cues. By repeatedly engaging in the experiential cycle, teachers internalize reflective habits that promote self-directed professional development. Experiential learning thus aligns with the goal of sustainability, ensuring that teacher growth continues beyond formal training environments.

## **2.6 Sustainability and Continuous Professional Development**

Sustainable teaching effectiveness refers to the ability of teachers to maintain high levels of pedagogical quality and professional relevance throughout their careers. It encompasses continuous learning, adaptability, and resilience in response to changing educational demands. Korau et al. (2024) observed that reflective practices are crucial for sustaining teacher awareness and responsiveness, particularly in contexts where professional development opportunities are limited. Enhanced microteaching, which emphasizes reflection and iterative feedback, provides a scalable model for promoting such sustainability.

In the age of artificiality, sustainability also involves ethical and emotional dimensions. Teachers must critically evaluate the implications of technology on learning equity, student well-being, and classroom dynamics. By embedding reflective and adaptive practices into professional routines, teachers can ensure that technological innovation complements rather than compromises pedagogical authenticity. Studies in Nigeria and Southeast Asia indicate that programs integrating

microteaching with reflective self-assessment yield long-term gains in teaching quality and learner outcomes (James et al., 2024; Omolere et al., 2025). This suggests that sustainable teaching effectiveness depends on cultivating dispositions of reflection, authenticity, and adaptability.

## **2.7 Synthesis of Literature**

The reviewed literature reveals convergence around three key insights. First, authenticity in teaching is a moral and pedagogical imperative that sustains meaningful learning in technology-rich contexts. Second, enhanced microteaching that integrates reflection, feedback, and adaptability fosters both immediate and long-term professional growth. Third, constructivist and experiential learning theories jointly explain how teachers transform experience into authentic practice. However, most empirical work has been concentrated in isolated institutional contexts, with limited cross-institutional comparisons or longitudinal follow-ups. This gap underscores the need for further investigation into how enhanced microteaching can sustain teaching effectiveness across diverse educational environments.

The present study addresses this gap by employing a mixed-methods design to explore how reflective practice, iterative feedback, and adaptive strategies interact to foster authenticity among pre-service science teachers in Southwestern Nigeria. By situating microteaching within constructivist and experiential frameworks, the study contributes to a deeper understanding of how teachers can maintain professional authenticity in an era dominated by artificiality.

## **3. Methodology**

### **3.1 Research Design**

This study adopted a mixed-methods design that combined quantitative and qualitative approaches to provide a comprehensive understanding of how enhanced microteaching processes contribute to sustainable teaching effectiveness. The quantitative component explored relationships among reflective practice, iterative feedback, adaptive instructional strategies, and teaching effectiveness, while the qualitative component provided deeper insights into teachers' lived experiences. Mixed-methods research was chosen because it integrates the strengths of both paradigms, ensuring that statistical results are contextualized by participants' narratives (Creswell & Plano Clark, 2018). The design also aligns with constructivist and experiential learning theories, which emphasize learning as a dynamic interaction between action and reflection.

### 3.2 Research Setting and Participants

The study was conducted in three public Colleges of Education located in Southwestern Nigeria. These institutions were selected because they run structured microteaching programs as part of their teacher education curriculum. A multi-stage sampling technique was employed. In the first stage, the three colleges were purposively selected based on accessibility and program comparability. In the second stage, 133 pre-service science teachers enrolled in Part II courses on microteaching were chosen using purposive sampling. Participants were distributed across the colleges as follows: College of Education, Ikere-Ekiti (n = 45), Federal College of Education, Oyo (n = 46), and Federal College of Education, Osiele, Abeokuta C (n = 42). The sample size was considered adequate for both descriptive and inferential statistical analyses (Cohen, Manion, & Morrison, 2018).

Demographically, the participants were aged between 19 and 27 years, with a mean age of 22.6. Approximately 61 percent were female and 39 percent male. All participants had completed foundational courses in educational psychology and teaching methodology, ensuring familiarity with basic pedagogical concepts before engaging in microteaching.

### 3.3 Enhanced Microteaching Intervention

The study implemented an enhanced microteaching model designed to promote reflection, feedback, and adaptability. Unlike conventional microteaching sessions that focus primarily on lesson delivery, the enhanced process incorporated three iterative phases:

1. **Reflective Practice:** Participants conducted self-assessments using a Reflective Practice Self-Assessment Scale before and after each microteaching session. This phase encouraged awareness of teaching strengths, areas for improvement, and connections between personal beliefs and instructional decisions.
2. **Iterative Feedback:** Peer and supervisor feedback were systematically collected after each microteaching session. The feedback emphasized constructive dialogue rather than evaluative judgment, helping participants translate observations into actionable goals for the next session.

3. **Adaptive Strategies:** Participants revised and retaught their lessons, integrating feedback to address classroom diversity, instructional pacing, and student engagement. The process encouraged flexible problem-solving and creative adaptation, both of which are central to sustainable teaching effectiveness.

Each college organized between four and six microteaching groups, each group comprising five to six participants. The intervention spanned six weeks, allowing sufficient time for repeated practice and reflection.

### 3.4 Instruments

#### 3.4.1 Quantitative Instruments

Two standardized scales were employed:

- **Teaching Effectiveness Scale (TES):** Adapted from prior validated instruments measuring instructional planning, classroom management, and communication competence. Internal consistency reliability for this study was  $r = 0.85$ .
- **Reflective Practice Self-Assessment Scale (RPSA):** Designed to assess the frequency and depth of teachers' reflection before, during, and after instruction. The Cronbach alpha coefficient was  $r = 0.85$ , indicating high internal reliability.

Both instruments used a 5-point Likert format ranging from 1 = *Strongly Disagree* to 5 = *Strongly Agree*. Construct validity was confirmed through expert review and pilot testing with 20 pre-service teachers not included in the main study.

#### 3.4.2 Qualitative Instruments

Qualitative data were gathered through semi-structured interviews with 15 participants selected across the three colleges. The interview guide focused on experiences of reflection, feedback, and adaptation during microteaching. Instructional guides and lesson plans were also analyzed to triangulate findings. Interviews lasted 30 to 45 minutes and were audio-recorded with participant consent.

### 3.5 Data Collection Procedures

Data collection occurred in three stages:

1. **Baseline Administration:** Participants completed the RPSA prior to the first microteaching session to establish initial reflective levels.
2. **Intervention Phase:** Participants engaged in three iterative microteaching cycles over six weeks. Observers completed the TES at each cycle, and peer-feedback forms were exchanged after every session.
3. **Post-Intervention Phase:** Participants retook the RPSA and completed open-ended reflection journals. The qualitative interviews were then conducted to capture nuanced perspectives on changes in teaching authenticity and confidence.

All procedures followed ethical guidelines for educational research, including informed consent, anonymity, and voluntary participation.

### 3.6 Data Analysis

#### 3.6.1 Quantitative Analysis

Quantitative data were analyzed using SPSS version 26.

- **Descriptive statistics** (means, standard deviations) summarized participants' reflective and teaching effectiveness scores.
- **Pearson correlation coefficients** examined relationships between reflective practice and teaching effectiveness.
- **Multiple regression analysis** identified predictive contributions of reflective practice, iterative feedback, and adaptive strategies to teaching effectiveness.
- **Cochran's C test** verified homogeneity of variances at  $p \leq 0.05$ .

#### 3.6.2 Qualitative Analysis

Interview transcripts and reflection journals were analyzed using content analysis. Codes were developed inductively to identify recurring patterns related to pedagogical authenticity, instructional confidence, and adaptability. The coding process involved open, axial, and selective

coding phases to ensure conceptual coherence. Triangulation among interview, observation, and quantitative findings strengthened credibility. Member checking was conducted with five participants to validate interpretations.

### **3.7 Ethical Considerations**

Approval for the study was obtained from the institutional ethics committees of the participating colleges. Participants were briefed about the study's purpose, confidentiality assurances, and their right to withdraw at any point without penalty. All data were anonymized, and digital recordings were stored on password-protected devices accessible only to the researchers.

### **3.8 Summary of Methodological Rigor**

The methodological design combined quantitative precision with qualitative depth, ensuring a holistic understanding of how enhanced microteaching influences authentic teaching. Reliability and validity were achieved through pilot testing, triangulation, and expert review. The combination of reflective practice measures and qualitative interviews allowed for both measurable and interpretive insights into teachers' professional growth. This robust methodological framework provides a solid foundation for analyzing the relationship between microteaching processes and sustainable teaching effectiveness.

## **4. Results and Discussion**

### **4.1 Overview**

This section presents the quantitative and qualitative findings on how enhanced microteaching contributes to sustainable teaching effectiveness. Quantitative data are summarized in Tables 1–3, followed by qualitative interpretations. The discussion integrates both strands of evidence to interpret how reflective practice, iterative feedback, and adaptive strategies promote authentic and sustainable teaching effectiveness in an increasingly artificial educational landscape.

### **4.2 Quantitative Findings**

#### **4.2.1 Descriptive Statistics**

Table 1 shows the pre- and post-intervention mean scores and standard deviations for reflective practice and teaching effectiveness.

**Table 1***Descriptive Statistics of Pre- and Post-Intervention Scores (N = 133)*

| Variable               | Pre-Mean | SD   | Post-Mean | SD   | Mean Difference |
|------------------------|----------|------|-----------|------|-----------------|
| Reflective Practice    | 3.42     | 0.51 | 4.21      | 0.48 | 0.79            |
| Teaching Effectiveness | 3.56     | 0.46 | 4.28      | 0.44 | 0.72            |

*Note.* Scores based on 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

As shown in Table 1, participants' reflective practice improved by 0.79 points and teaching effectiveness by 0.72 points after six weeks of enhanced microteaching. These gains demonstrate the intervention's positive influence on teacher self-awareness and instructional competence. The increase parallels the findings of Omolere, Ebiseni, and Lucky (2025), who observed significant performance gains when digital video feedback was integrated into microteaching.

#### 4.2.2 Correlation Analysis

The Pearson correlation coefficients among the study variables are displayed in Table 2.

**Table 2***Correlation Matrix for Major Study Variables (N = 133)*

| Variables                 | 1      | 2      | 3     | 4    |
|---------------------------|--------|--------|-------|------|
| 1. Reflective Practice    | 1.00   |        |       |      |
| 2. Iterative Feedback     | 0.65** | 1.00   |       |      |
| 3. Adaptive Strategies    | 0.59** | 0.61** | 1.00  |      |
| 4. Teaching Effectiveness | 0.71** | 0.69** | 0.58* | 1.00 |

*Note.*  $p < .05$  (\*),  $p < .01$  (\*\*).

As seen in Table 2, reflective practice correlated strongly with teaching effectiveness ( $r = 0.71$ ,  $p < .01$ ), and iterative feedback was also strongly correlated with both reflective practice ( $r = 0.65$ ,

$p < .01$ ) and teaching effectiveness ( $r = 0.69, p < .01$ ). Adaptive strategies demonstrated a moderate yet significant relationship with teaching effectiveness ( $r = 0.58, p < .05$ ). These results confirm that reflective and feedback mechanisms play key roles in improving instructional quality, consistent with James, Uwannah, Egwuonwu, and Joshua (2024).

#### 4.2.3 Multiple Regression Analysis

To examine the predictive contributions of each independent variable, a multiple regression analysis was performed with teaching effectiveness as the dependent variable. The results are summarized in Table 3.

**Table 3**

*Multiple Regression Predicting Teaching Effectiveness (N = 133)*

| Predictor   | B    | SE B | $\beta$ | t    | Sig.   |
|---|------|------|---------|------|--------|
| Reflective Practice   | 0.48 | 0.07 | .48     | 6.86 | < .001 |
| Iterative Feedback  | 0.31 | 0.09 | .31     | 4.29 | < .01  |
| Adaptive Strategies   | 0.22 | 0.08 | .22     | 2.94 | < .05  |
| <b>Model Summary:</b> $F(3, 129) = 47.82, p < .001$ , Adjusted $R^2 = 0.69$ |      |      |         |      |        |

As Table 3 shows, the model explained 69 percent of the variance in teaching effectiveness,  $F(3, 129) = 47.82, p < .001$ . Reflective practice emerged as the most powerful predictor ( $\beta = .48, p < .001$ ), followed by iterative feedback ( $\beta = .31, p < .01$ ) and adaptive strategies ( $\beta = .22, p < .05$ ). These results confirm that self-reflection is the foundation upon which feedback and adaptability translate into sustainable teaching effectiveness, echoing **Bistu and Mangywat (2024)**.

Cochran's C test confirmed homogeneity of variances ( $p = .09$ ), validating that these differences were not influenced by sampling bias across the three institutions.

### **4.3 Qualitative Findings**

#### **4.3.1 Pedagogical Authenticity**

Interview data revealed a significant transformation in teachers' conception of authenticity. Initially, participants viewed microteaching as a graded performance, but later they perceived it as a reflective journey of professional self-discovery. One participant noted, "I no longer teach for scores; I teach to connect my lesson with real learning." This mirrors Korau, Aliyu, Ya'u, and Jika (2024), who emphasized reflection as the key to professional authenticity.

#### **4.3.2 Instructional Confidence**

Repeated practice and peer feedback enhanced instructional confidence. Participants mentioned that re-teaching sessions helped them refine questioning skills, classroom pacing, and error management. This finding parallels Omolere et al. (2025), who demonstrated that repeated microteaching cycles reduce anxiety and strengthen teaching assurance.

#### **4.3.3 Adaptability and Reflective Growth**

Participants described becoming more flexible and experimental, adjusting methods to better engage learners. Several referred to the process as "learning to unlearn," which underscores adaptability as a marker of sustainable professional growth. Similar outcomes were documented by Daodu, Elegbede, and Adedotun (2024), who found constructivist practices promote creativity and problem-solving.

#### **4.3.4 Integration of Technology**

An emerging theme concerned teachers' evolving perspectives on technology. While early perceptions framed technology as a threat, reflective sessions repositioned it as a tool for improvement. One participant observed, "Technology can record my teaching, but it cannot reflect for me." This insight reinforces Deng (2023), who argues that human reflection must guide digital innovation in education.

#### **4.4 Discussion**

##### **Reflective Practice as the Core Driver of Authenticity**

The quantitative results (Tables 1–3) demonstrate that reflective practice exerted the strongest influence on teaching effectiveness. Qualitative narratives corroborate this, showing that reflection empowered teachers to align their values with their instructional choices. This reinforces Schön's (1983) theory of the reflective practitioner and supports Korau et al. (2024), who reported that reflective teachers sustain authenticity and moral integrity.

##### **Iterative Feedback and Professional Growth**

Feedback was instrumental in converting reflection into actionable improvement. The strong correlations shown in Table 2 indicate that feedback mechanisms fostered both cognitive and behavioral change. Participants' testimonies confirm that dialogic feedback built confidence and facilitated continuous refinement, aligning with James et al. (2024).

##### **Adaptive Strategies and Sustainability**

Although adaptive strategies were the least powerful predictor (Table 3), they were crucial for maintaining long-term teaching effectiveness. Adaptability enabled teachers to respond to classroom diversity and technological shifts, validating Bistu and Mangwat (2024), who identified flexibility as a hallmark of competent teachers.

##### **Authenticity in the Age of Artificiality**

Combined results reveal that enhanced microteaching nurtures authenticity even amid technological mediation. Teachers integrated technology as an aid to reflection rather than a substitute for it, consistent with Deng (2023) and Daodu et al. (2024). This demonstrates that authentic teaching can coexist with artificial systems when guided by reflective and ethical intentionality.

#### **4.5 Summary of Key Insights**

Across all analyses, three major conclusions emerge:

1. Reflective practice remains the cornerstone of authentic and effective teaching.
2. Iterative feedback operationalizes reflection into measurable performance improvement.

### 3. Adaptability sustains professional competence in dynamic, technology-driven contexts.

Together, these elements form a cyclical model of growth consistent with constructivist and experiential learning frameworks, providing a replicable approach for cultivating authentic teachers in the age of artificiality.

## 5. Conclusion and Recommendations

This study examined how enhanced microteaching; integrating reflection, feedback, and adaptive instructional strategies promotes sustainable teaching effectiveness among pre-service teachers in Southwestern Nigeria. Quantitative findings revealed significant post-intervention improvements in reflective practice and teaching effectiveness, with reflective practice emerging as the strongest predictor ( $\beta = .48, p < .001$ ). Qualitative insights reinforced these outcomes, showing increased pedagogical authenticity, instructional confidence, and adaptability. Together, the results affirm that structured reflection and iterative feedback transform microteaching from a performance exercise into a process of sustained professional growth.

The findings demonstrate that reflective practice is the foundation of authentic teaching, while feedback operationalizes reflection into improvement. Adaptive strategies further sustain effectiveness across diverse and technology-driven classrooms. These conclusions align with prior studies that emphasize reflection and feedback as key drivers of teacher development (James, Uwannah, Egwuonwu, & Joshua, 2024; Omolere, Ebiseni, & Lucky, 2025).

### Implications for Teacher Education

Teacher education programs should embed structured reflection and peer feedback within microteaching modules. The use of video analysis and reflective journals encourages continuous improvement and authenticity. Mentoring systems that emphasize dialogic feedback can further strengthen professional identity and self-efficacy. Integrating digital tools for reflective purposes, rather than surveillance, ensures that technology supports human-centered learning.

## Policy Recommendations

1. **Teacher Education Standards:** National frameworks should require reflective and feedback-driven microteaching cycles in all teacher preparation programs.
2. **Continuous Professional Development:** Ministries of Education should adopt enhanced microteaching for in-service training to reinforce lifelong reflective habits.
3. **Digital Reflection Infrastructure:** Institutions should establish affordable microteaching studios and promote ethical, reflective use of educational technologies.

## Conclusion

Enhanced microteaching fosters authentic, adaptive, and sustainable teaching by aligning reflection, feedback, and adaptability in a continuous cycle of improvement. As artificial intelligence and automation expand in education, these human-centered processes safeguard the essence of authentic pedagogy. Teachers who reflect critically, adapt creatively, and engage ethically are best positioned to sustain educational quality in the age of artificiality.

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