

# The Philosophical Assumptions and Applications of Constructivist Approach for Sustainable Teaching and Learning Processes in Nigeria

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## Abstract

From a philosophical perspective, constructivism challenges traditional notions of knowledge acquisition by emphasizing the active role of learners in constructing meaning in teaching and learning processes. The foundation of constructivism lies mainly in the works of Jean Piaget, who proposed that learning is an active process where individuals assimilate new information into existing mental structures or accommodate existing structures to incorporate new information. Moreover, Lev Vygotsky's sociocultural theory further emphasizes this active engagement in learning, which underscores the importance of social interactions and collaborative learning in cognitive development. Therefore, this paper critically discusses constructivism as a philosophical assumption and its applications for sustainable educational research. It delved into constructivism's philosophical foundations, including Piaget and Vygotsky's contributions. It presented a critique of constructivism and its limitations in education research, explores the practical implications of constructivism in shaping pedagogical practices, instructional Design, and technology-enhanced learning. Subsequently, by examining relevant literature and scholarly perspectives, this paper provides a comprehensive overview of constructivism's role and its sustainable implications in educational research. It was concluded that constructivism offers valuable perspectives on knowledge construction for sustainable practices in teaching and learning processes.

**Keywords:** Sustainability, Constructivism, Education, Pedagogy, Technology

## 1. Introduction

Constructivism, as a philosophical and pedagogical approach, emphasizes the active construction of knowledge by learners through experiences, interactions, and reflections (Piaget, 1970; Vygotsky, 1978). Piaget's cognitive constructivism emphasizes the internal processes of meaning-making, while Vygotsky's social constructivism

underscores the role of social interactions in learning (Fosnot, 2013). These theories have guided educational researchers in developing teaching methods that prioritize experiential learning, collaborative tasks, and reflective thinking. For instance, in research on blended learning environments, constructivist principles have been instrumental in designing digital tools and platforms that promote active engagement, problem-solving, and peer collaboration (Jonassen, 2000). Similarly, constructivism has influenced qualitative research methodologies, such as case studies and narrative inquiries, which explore participants' lived experiences to construct new insights (Merriam & Tisdell, 2016). Therefore, this discourse critically examines the role of constructivism in educational research and explores its sustainable implications, particularly in fostering long-term improvements in education systems. It is worthy of note that, constructivism has significantly influenced educational research by shifting the focus from teacher-centered methodologies to learner-centered paradigms.

In educational research, constructivism has gained significant attention due to its implications for teaching and learning. Constructivism is a philosophical perspective that posits knowledge as actively constructed by individuals based on their experiences and interactions with the world (Driscoll, 2005). Constructivism, as a philosophical assumption, emphasizes the active role of individuals in constructing their understanding and knowledge of the world. This theory has been widely applied in education to shape teaching and learning practices. According to Jonassen and Land (2012), constructivism posits that learners should be engaged in authentic, meaningful tasks where they can actively build their knowledge through experiences and interactions with the environment.

Remarkably, constructivism is the assumption that learners are active agents in the construction of knowledge and that learning is naturally social and contextual, while knowledge is subjective and continuously evolving. However, these assumptions challenge researchers to adopt methodologies that capture the teaching and learning processes' complex and dynamic nature. These constructivist principles have implications for qualitative research methods, such as case studies, narrative inquiry, and ethnography, which provide in-depth, contextualized insights into learners' experiences and meaning-making processes (Kirschner et al., 2006). Additionally, quantitative research methods have also exemplified the practical application of constructivist principles, as they involve iterative cycles of designing, implementing, and refining educational interventions in real-world settings.

Constructivist-informed research aims to enhance educational outcomes by emphasizing learner-centred environments, formative assessments, scaffolding, and reflective practices through a deeper understanding of how learners construct knowledge. One of the key contributors to constructivism is Jean Piaget, who proposed that learning is an active process where individuals assimilate new information into existing mental structures or accommodate existing structures to incorporate new information (Piaget, 1954). Lev Vygotsky's sociocultural theory further emphasizes this

active engagement in learning, which underscores the importance of social interactions and collaborative learning in cognitive development (Vygotsky, 1978). Constructivism has several applications in educational research, particularly in shaping pedagogical practices and instructional Design. It advocates for student-centred learning environments where learners actively engage with meaningful tasks and authentic problems (Driscoll, 2005). This approach disagrees with traditional teacher-centred methods that focus on passive knowledge transmission in educational practices.

Constructivism in educational research is the shift from teacher-centred to student-centred instruction. By recognizing the diverse ways learners construct knowledge, educators can design learning environments that cater to individual needs and preferences. For instance, Vygotsky's social-cultural theory of constructivism emphasizes the importance of social interactions in learning, highlighting the role of peer collaboration and scaffolding by more knowledgeable others (Vygotsky, 1978). Additionally, the concept of "scaffolding" in cognitive development, as proposed by Vygotsky, has been integrated into instructional Design to support learners in acquiring new knowledge and skills. Through providing structured support and guidance, educators can help students' gradually master complex tasks and concepts (Wood et al., 1976). This approach fosters a deeper understanding of the content and promotes critical thinking skills among learners.

Furthermore, constructivist principles have inspired the development of technology-enhanced learning environments that promote inquiry-based learning, problem-solving, and reflection (Jonassen et al., 2003). Virtual environments, simulations, and multimedia tools are examples of how technology can support constructivist learning experiences. However, constructivism is not without criticisms and limitations. Some scholars argue that constructivist approaches may overlook the importance of explicit instruction, especially for foundational knowledge and skills (Kirschner et al., 2006). Critics also highlight challenges in assessing learning outcomes within constructivist frameworks as the focus shifts from standardized measures to diverse forms of evidence (Liu et al., 2017).

Constructivism is a philosophical perspective that asserts knowledge is actively constructed by individuals based on their experiences and interactions with the world (Jonassen & Land, 2012). This view challenges traditional notions of passive knowledge transmission and emphasizes the role of learners in constructing meaning (Driscoll, 2005). Constructivism has gained significant attention in educational research due to its implications for teaching and learning methodologies. Therefore, constructivism offers valuable insights into learning processes and has practical applications in educational research. Its emphasis on active learning, collaboration, and technology integration contributes to the ongoing discourse on effective teaching and learning strategies.

## 2. Key Principles and Assumptions of Constructivist approach to teaching and learning processes

Constructivism is a philosophical perspective that posits knowledge as actively constructed by individuals based on their experiences and interactions with the world. In educational research, constructivism has gained significant attention due to its implications for teaching and learning. Constructivism in educational research encompasses several vital principles and assumptions that have evolved and been critiqued. The review highlighted prominent principles, assumptions, and critical insights from scholarly literature.

1. **Active Learning and Knowledge Construction:** Constructivism posits that learning is an active process where learners construct knowledge through their experiences and interactions (Jonassen & Land, 2012). This principle emphasizes the importance of hands-on activities, problem-solving, and critical thinking in educational settings (Driscoll, 2005).

2. **Social Interaction and Collaboration:** Vygotsky's sociocultural theory underpins constructivism's emphasis on social interaction and collaborative learning (Vygotsky, 1978). Learners engage in joint activities, discussions, and peer interactions to co-construct knowledge (Jonassen et al., 2003).

3. **Multiple Perspectives and Contextual Learning:** Constructivism recognizes that individuals bring diverse perspectives and prior knowledge to learning contexts. This notion advocates for contextualized learning experiences that relate to learners' real-world experiences and cultural backgrounds (Brooks & Brooks, 1999).

4. **Metacognition and Reflection:** Metacognitive strategies, such as self-regulation and reflection, are integral to constructivist approaches (Schraw, 2006). Learners are encouraged to monitor their learning processes, set goals, and evaluate their understanding through reflective practices (Jonassen et al., 2003).

5. **Technology Integration and Inquiry-Based Learning:** Technology integration in education aligns with constructivist principles, supporting inquiry-based learning, interactive simulations, and multimedia resources (Jonassen et al., 2003). Technology enhances learners' abilities to explore, collaborate, and create knowledge.

## 3. Explorations of Constructivist approach to teaching and learning

Critics argue that constructivism can sometimes lead to relativism, where the lack of objective standards makes it challenging to assess the validity of different knowledge constructions. Additionally, according to (Tobias and Duffy, 2009), constructivism's emphasis on individual and contextual learning experiences can be seen as impractical

in standardized educational settings that require uniform assessment criteria. Some educators and researchers also contend that constructivism underestimates the role of direct instruction and the importance of foundational knowledge, which can be crucial for learners to engage meaningfully in higher-order thinking and problem-solving (Kirschner et al., 2006). These critiques highlight the ongoing debate about balancing learner autonomy and guided instruction in practical education.

Moreover, some scholars argue that constructivist approaches may overlook the importance of explicit instruction, especially for foundational knowledge and skills (Kirschner et al., 2006). Critics also highlight challenges in assessing learning outcomes within constructivist frameworks as the focus shifts from standardized measures to diverse forms of evidence (Liu et al., 2017). However, the application of constructivism in educational contexts can vary widely, leading to consistency in implementation and evaluation. It requires careful consideration of learner characteristics, cultural backgrounds, and learning objectives to integrate constructivist principles into teaching practices effectively.

While constructivism has influenced educational research and practice significantly, several debates and critiques have emerged:

- **Balance between Guidance and Discovery:** Scholars debate the balance between providing guidance and allowing discovery in constructivist learning environments (Kirschner et al., 2006). Critics argue that overly constructivist approaches without adequate guidance may lead to misconceptions and incomplete understanding.
- **Assessment Challenges:** Assessing learning outcomes within constructivist frameworks poses challenges, as traditional measures may not capture the complexity of knowledge construction and diverse forms of evidence (Liu et al., 2017).
- **Cultural and Contextual Considerations:** Applying constructivist principles requires careful consideration of cultural diversity, learner backgrounds, and contextual factors (Brooks & Brooks, 1999). One-size-fits-all approaches may need to be revised to effectively address diverse learners' needs.

#### 4. Applications of Constructivism in Education Research

Constructivism has profound implications for educational research, particularly in shaping pedagogical practices and instructional Design. According to Driscoll (2005), constructivist approaches emphasize student-centred learning, where learners actively engage with meaningful tasks and authentic problems. This approach contrasts with traditional teacher-centred methods focused on the passive transmission of knowledge. In technology-enhanced learning, constructivism has inspired the development of interactive and collaborative learning environments. Jonassen et al. (2003) note that constructivist principles underpin the Design of educational technologies that promote inquiry-based learning, problem-solving, and reflection. Virtual environments,

simulations, and multimedia tools are examples of how technology can support constructivist learning experiences.

Over the years, the application of constructivism in education research has been explored extensively, particularly in aligning research methodologies, guiding curriculum design, and informing instructional strategies. This critical review examines the multifaceted application of constructivism during this period, highlighting critical research methodologies and the impact of constructivist principles on curriculum design and instructional strategies.

### **Explorations of Research Methodologies Aligned with Constructivism:**

Constructivism has influenced various research methodologies, prioritizing active engagement, collaboration, and contextualized learning experiences. In quantitative research, for instance, (Koshy, 2005) emphasizes collaboration between researchers and practitioners to address real-world problems and co-construct knowledge. On the other hand, qualitative research approaches such as phenomenology and grounded theory align with constructivist principles by focusing on individuals' subjective experiences and the construction of meaning (Creswell, 2013). Moreover, mixed methods research has also integrated constructivist elements by combining qualitative and quantitative data to explore complex educational phenomena (Creswell & Plano Clark, 2018). Using case studies, ethnography, and participant observation in educational research reflects constructivist perspectives that emphasize understanding learners' perspectives within their social and cultural contexts (Merriam, 2009).

### **Guidance in Curriculum Design:**

Constructivism guides curriculum design by emphasizing learner-centred approaches, inquiry-based learning, and the integration of authentic tasks and real-world contexts (Driscoll, 2005). Curriculum designers incorporate constructivist principles to create meaningful learning experiences that promote critical thinking, problem-solving, and metacognitive skills (Jonassen et al., 2003). The Design of project-based learning, problem-based learning, and experiential learning activities reflects constructivist ideals of active engagement and knowledge construction (Savery & Duffy, 1995).

Constructivism also informs curriculum alignment with standards and competencies, ensuring learning goals are relevant, achievable, and connected to students' prior knowledge and experiences (Wiggins & McTighe, 2005). Integrating technology in curriculum design aligns with constructivist principles by providing interactive and collaborative learning environments that support inquiry and exploration (Jonassen et al., 2003).

### **Instructional Strategies Guided by Constructivism:**

Constructivism influences instructional strategies by promoting student-centred approaches, scaffolding, and differentiated instruction (Ormrod, 2011). Teachers adopt



facilitator roles, encouraging active participation, collaboration, and reflection among learners (Driscoll, 2005). Scaffolding techniques, such as modelling, questioning, and providing feedback, support students' cognitive development and self-regulation (Wood, Bruner, and Ross, 1976).

Inquiry-based learning strategies, problem-solving tasks, and project-based activities align with constructivist principles, fostering curiosity, creativity, and critical thinking skills (Blumenfeld et al., 1991). Collaborative learning strategies, peer interactions, and group projects promote social constructivism, where learners co-construct knowledge through shared experiences and dialogue (Vygotsky, 1978).

### **5. Practicality of Constructivism in Today's Educational Research**

Constructivism, as a theoretical framework in education, involves many things at a time in today's educational landscape, considering some factors as highlighted by (), and this includes;

#### **The strengths of Constructivism include the following;**

- i. Active Learning and Engagement where students construct knowledge through hands-on experiences, problem-solving, and inquiry-based activities (Jonassen & Land, 2012).
- ii. Real-world Relevance emphasizes learning in real-world contexts, fostering meaningful connections and transferable skills (Driscoll, 2005).
- iii. Critical thinking skills include questioning, analyzing, and evaluating information to construct understanding (Ormrod, 2011).

### **Applications and Practical Implications of Constructivism**

Constructivism in today's world imparts education through

- i. Technology-enhanced learning through interactive simulations, online collaboration, and multimedia resources (Jonassen et al., 2003).
- ii. Promoting learner-centred approaches, authentic tasks, and interdisciplinary learning experiences in curriculum design (Savery & Duffy, 1995).
- iii. Informing instructional strategies such as inquiry-based learning, cooperative learning, and differentiated instruction to cater for diverse learner needs (Blumenfeld et al., 1991).

### **Limitations and Challenges of Constructivism**

Finding the right balance between providing guidance and allowing for student autonomy in constructivist learning environments remains a topic of debate because, despite its strengths, constructivism faces criticism for its potential lack of structure and difficulty in assessing learning outcomes objectively (Kirschner et al., 2006). Additionally, Assessing learning outcomes within constructivist frameworks can be challenging due to the focus on qualitative evidence and diverse forms of student

understanding (Liu et al., 2017). However, these challenges seem to require a cultural sensitivity and awareness of diverse learner backgrounds, which may pose challenges in implementation as posited by (Brooks & Brooks, 1999).

It has also been argued that overly learner-centered approaches may neglect foundational knowledge, which is essential for advanced cognitive tasks. In educational research, these challenges necessitate a balanced approach that incorporates constructivist principles without compromising instructional clarity or accountability (Liu & Matthews, 2005). Moreover, constructivism's reliance on context-specific learning raises questions about scalability and applicability in diverse educational settings. Researchers must consider the cultural, economic, and institutional contexts to ensure that constructivist practices are both effective and sustainable (Biesta, 2010).

Constructivism continues to offer a robust framework for exploring innovative and sustainable practices in education. Future research could focus on integrating constructivist principles with emerging technologies, such as artificial intelligence and virtual reality, to create immersive and adaptive learning environments (Dillenbourg et al., 2009). Additionally, constructivist methodologies can be applied to evaluate the long-term impact of sustainability education initiatives, providing evidence-based recommendations for policy development. Nonetheless, the effectiveness of constructivism varies across disciplines and subject areas, leading to discussions about its applicability in different educational contexts (Duffy & Jonassen, 2013). However, while integrating constructivist principles with more traditional instructional methods continues to be explored in education, there is the need to aim for a balanced and practical approach to teaching and learning (Savery, 2006).

## **6. Future Directions and Implications of Constructivist theories for sustainable Educational Research**

As constructivism continues to shape educational research and practice, scholars have suggested reasons, among others, to;

- i. explore integrating emerging technologies, such as artificial intelligence, virtual reality, and adaptive learning systems, within constructivist frameworks (Jonassen & Land, 2012). This includes designing intelligent tutoring systems that provide personalized scaffolding and feedback based on learners' cognitive processes and knowledge construction.
- ii. Cultivate online collaborative learning communities that transcend physical boundaries, enabling students to engage in meaningful dialogue, peer feedback, and co-construction of knowledge (Duffy & Jonassen, 2013).
- iii. Prioritize designing inclusive learning environments that address equity gaps, cultural sensitivity, and accessibility challenges (Brooks & Brooks, 1999).



- iv. Introduce innovative assessment practices, such as digital portfolios, performance-based assessments, and multimedia artefacts, to capture the complexity of knowledge construction and meaningful learning outcomes (Liu et al., 2017).
- v. Investigate effective instructional strategies, scaffolding techniques, and adaptive learning pathways that support students' cognitive development while promoting self-regulation and metacognitive skills (Kirschner et al., 2006).
- vi. Provide comprehensive professional development programs that equip teachers with pedagogical strategies, technology integration skills, and cultural competence to facilitate constructivist learning experiences (Ormrod, 2011).
- vii. Encourage interdisciplinary collaboration to leverage insights from diverse fields, inform best practices, and address complex educational challenges (Savery, 2006).
- viii. Conduct longitudinal studies and rigorous impact assessments can provide deeper insights into the long-term effects of constructivist approaches on student learning outcomes, academic achievement, retention rates, and career readiness (Driscoll, 2005).
- ix. Effectively supporting teachers in implementing constructivist strategies requires ongoing professional development, resources, and pedagogical support (Ormrod, 2011).

## **7. Sustainable Implications of Constructivism in teaching and learning processes**

### **a. Promoting Lifelong Learning**

Constructivism advocates for the development of critical thinking and self-regulated learning skills, essential for lifelong learning (Schunk, 2020). By encouraging students to take ownership of their learning processes, constructivist practices prepare individuals to adapt to changing knowledge landscapes and global challenges, fostering sustainable personal and professional growth.

### **b. Equity and Inclusion in Education**

Constructivist approaches can contribute to equity and inclusion by recognizing and valuing diverse cultural, social, and individual perspectives in learning environments. This is particularly relevant in educational research that seeks to address disparities in resource allocation and access to quality education (Banks, 2015). Constructivist methodologies enable researchers to highlight marginalized voices, promoting policies and practices that support diverse learners sustainably.

### **c. Sustainable Pedagogical Practices**

Constructivism aligns with sustainability in education by emphasizing active, participatory learning rather than rote memorization. Educational research informed by constructivist principles advocates for practices such as project-based learning and interdisciplinary approaches, which integrate real-world issues like climate change and social justice into the curriculum (Sterling, 2010). These methods cultivate environmental and social awareness, equipping learners with the tools to address sustainability challenges.

## 8. Conclusion

In conclusion, constructivism is a foundational framework in educational research, guiding the development of learner-centred pedagogies that prioritize active engagement, collaboration, and meaningful learning experiences. With its emphasis on the active construction of knowledge, social context, and the subjective nature of learning, constructivism provides a robust philosophical foundation for contemporary educational research. It encourages methodologies that delve deeply into the processes by which learners construct meaning, favouring qualitative approaches such as case studies, narrative inquiry, and ethnography. Additionally, constructivist principles underpin action and design-based research, prioritising practical, iterative, and context-sensitive interventions.

Constructivism has profoundly influenced educational research by promoting active, participatory learning and fostering critical thinking. Its sustainable implications are evident in its potential to support lifelong learning, equity, and environmentally conscious pedagogies. However, challenges related to scalability, assessment, and contextual relevance must be addressed to maximize its impact. By integrating constructivist principles with contemporary research and practice, educational researchers can contribute to building resilient and sustainable education systems. Although, despite its transformative impact, constructivism also faces critiques, particularly regarding the challenges of implementing individualized learning in standardized settings and the need for a balance between learner autonomy and guided instruction. Addressing these critiques while leveraging constructivist insights can lead to more effective and holistic educational practices that cater to the diverse needs of learners.

However, as educational research advances, the principles of constructivism will remain essential for fostering deep and meaningful learning experiences in classroom practices. Its applications in educational research have influenced pedagogical approaches and the Design of learning environments. Therefore, by embracing the principles of constructivism, educators can create dynamic and interactive learning environments that support students in constructing their knowledge effectively.

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