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Constructivist Learning and Its Relationship with Self-Regulated Learning and Problem-Solving Skills among Adult Learners

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Abstract

Adult learners require learning approaches that acknowledge their experiences, autonomy, and real-life problem contexts. Constructivist learning has been widely recognized as an instructional approach that supports meaningful learning through active engagement and knowledge construction. This article aims to examine the relationship between constructivist learning, self-regulated learning, and problem-solving skills among adult learners. Using a qualitative conceptual approach supported by recent empirical studies, this paper explains how constructivist learning environments foster self-regulated learning processes, which in turn enhance adult learners' problem-solving skills. The discussion highlights that self-regulated learning functions as a key mediating process linking constructivist pedagogy and problem-solving competence. This article contributes to adult education literature by offering a process-oriented framework for understanding how learner-centered pedagogies support higher-order skills development in adult learning contexts.

Keywords: Constructivist Learning, Self-Regulated Learning, Problem-Solving Skills, Adult Learners

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Introduction

Adult education in non-formal settings plays a strategic role in providing learning opportunities for individuals who have limited access to formal education pathways (Love et al., 2023; Mertens et al., 2025). Adult learners in non-formal education bring diverse life experiences, social roles, and responsibilities that fundamentally shape how they engage with learning (Ditlhale & van den Berg, 2024; Fındık, 2024). As a result, effective learning in non-formal contexts requires pedagogical approaches that are flexible, learner centered, and closely connected to real-life problem situations.

Constructivist learning theory offers a relevant foundation for understanding learning processes in non-formal adult education (Aljafari, 2021; Bellare et al., 2023; Modenos, 2024). Rather than positioning learners as passive recipients of knowledge, constructivist learning emphasizes active meaning-making through experience, reflection, and social interaction (Knowles, 1980; Scholtz, 2023; Wang et al., 2025). In non-formal education contexts such as equivalency programs, community learning centers, and lifelong learning initiatives constructivist approaches enable adult learners to connect learning content with everyday challenges in work, family, and community life.

However, engagement in constructivist learning activities alone does not automatically lead to the development of higher-order skills (Endres et al., 2024; "Epistemological Development: An Implicit Entailment of Constructivist Learning Environments," 2004; McQueen & McMillan, 2020). Adult learners must also be able to regulate their learning processes independently, particularly in non-formal

settings characterized by flexible structures and limited external supervision (Chan & Uhlmann, 2020; Kuuluvainen et al., 2025; van der Stap et al., 2024). Self-regulated learning (SRL) therefore becomes a crucial internal process that enables learners to plan, monitor, and evaluate their learning while managing motivational and emotional demands (Michalsky, 2020; Prasad & Sane, 2024; Yabukoshi, 2024).

This article aims to explore the relationship between constructivist learning, self-regulated learning, and problem-solving skills among adult learners in non-formal education. Specifically, it conceptualizes self-regulated learning as a mediating process through which constructivist learning environments support the development of problem-solving skills. By focusing on qualitative insights and theory-driven analysis, this article contributes to a deeper understanding of learning processes in non-formal adult education contexts.

a. Constructivis Learning

Constructivist learning theory conceptualizes learning as an active and contextualized process in which individuals construct knowledge through interaction with their environment, reflection on experience, and social negotiation of meaning (Keronen et al., 2024; Tsai et al., 2023). In non-formal adult education, this perspective is particularly relevant because adult learners draw heavily on prior experiences, practical knowledge, and contextual understanding when engaging with learning activities (Jiang & Vásquez, 2025a, 2025b).

In non-formal settings, constructivist learning is commonly enacted through strategies such as problem-based learning, collaborative discussion, experience sharing, and reflective dialogue (Bahufite et al., 2023; Cheng et al., 2025). These strategies allow adult learners to situate learning within authentic contexts, making learning meaningful and directly applicable to everyday life. Tutors or facilitators function not as authoritative transmitters of knowledge, but as learning companions who scaffold inquiry, encourage dialogue, and support reflection.

Constructivist learning environments also emphasize social interaction as a central mechanism for learning (Liu et al., 2025; Wu et al., 2025). Through discussion and collaboration, adult learners negotiate perspectives, compare experiences, and collectively construct understanding (Everard et al., 2025; Morris, 2024). This social dimension is especially important in non-formal education, where learners' diverse backgrounds enrich the learning process and foster mutual learning.

By engaging adult learners in authentic problems and reflective dialogue, constructivist learning creates conditions that stimulate deeper cognitive engagement and critical awareness. These conditions form the pedagogical foundation upon which self-regulated learning and problem-solving skills can develop.

b. Self-Regulated Learning

Self-regulated learning (SRL) refers to the processes through which learners actively manage their learning by setting goals, selecting strategies, monitoring progress, and reflecting on outcomes (Brenner, 2024; Feng et al., 2025; Maloney et al., 2025). SRL integrates cognitive, motivational, and behavioral regulation, making it particularly relevant for adult learners who often study in flexible and less structured environments.

Adult learners frequently balance learning with work, family, and social responsibilities. As a result, successful learning depends not only on instructional quality but also on learners' capacity to regulate effort, manage time, and maintain motivation (Cai & Yu, 2024; Llacuna & Mason, 2022). Constructivist learning environments naturally support the development of SRL by encouraging autonomy, reflection, and responsibility.

Through activities such as self-reflection, collaborative inquiry, and problem analysis, adult learners learn to evaluate their understanding, adjust strategies, and regulate emotions such as frustration or anxiety. These regulatory processes enable learners to remain engaged and persistent when facing complex learning challenges.

c. Problem-Solving Skills in Adult Learning Contexts

Problem-solving skills involve the ability to identify problems, generate alternative solutions, evaluate consequences, and implement appropriate actions (Helmold, 2023; Mahanal et al., 2022). In adult education, problem-solving is closely tied to real-life contexts, including workplace challenges, family decision-making, and community issues.

Constructivist learning approaches position problem-solving as a central learning activity rather than an outcome (Arruzza et al., 2023; Pujiastuti et al., 2025). By engaging with authentic problems, adult learners practice analytical thinking, decision-making, and reflective judgment. However, effective problem-solving requires more than cognitive ability; it also depends on learners' self-regulatory capacities. Adult learners with well-developed self-regulated learning skills are better able to persist in problem-solving tasks, manage emotional responses, and evaluate the effectiveness of different solutions. Thus, problem-solving skills emerge as an integrated outcome of constructivist engagement and self-regulatory processes.

Methods

This study employed a qualitative conceptual research design grounded in constructivist learning theory and self-regulated learning frameworks to explore the development of problem-solving skills among adult learners in non-formal education contexts. Rather than collecting primary empirical data, this study focused on an interpretive synthesis of theoretical and qualitative empirical literature relevant to adult learning, non-formal education, and learner-centred pedagogies.

The methodological approach involved three analytical stages.

First, a focused review of recent literature (approximately the last 5–10 years) was conducted to identify core concepts related to constructivist learning, self-regulated learning, and problem-solving skills within adult and non-formal education settings. Priority was given to qualitative studies, theoretical papers, and educational development research that addressed learning processes rather than outcome measurement alone.

Second, the selected literature was analyzed thematically using a theory-driven qualitative analysis. This process involved identifying recurring patterns, mechanisms, and relationships that explain how constructivist learning environments shape adult learners' self-regulated learning processes. Attention was given to contextual characteristics of non-formal education, such as flexible learning structures, learner diversity, and the integration of real-life problem contexts.

Third, a conceptual model was developed to explain the mediating role of self-regulated learning between constructivist learning and problem-solving skills. This model was constructed through iterative comparison between theoretical perspectives and qualitative findings reported in prior studies, allowing for an integrative and process-oriented interpretation.

This qualitative conceptual approach is appropriate for examining complex learning phenomena that are deeply contextual, socially constructed, and not easily captured through quantitative measurement. It enables a deeper understanding of how pedagogical practices and internal learning mechanisms interact in non-formal adult education.

Results and Discussions

1. Results

a. Constructivist Learning as a Contextual Learning Environment

The reviewed literature consistently indicates that constructivist learning in non-formal adult education is characterized by authentic learning tasks, dialogue-based interaction, and experience-based reflection (Endres et al., 2024; Greiff et al., 2013; McQueen & McMillan, 2020). Learning activities are often grounded in real-life problems encountered in work, family, and community contexts. These conditions enhance learning relevance and motivate adult learners to engage actively in the learning process.

Constructivist learning environments position adult learners as contributors of knowledge rather than passive recipients (Kolikant & Wegerif, 2025; McCarthy & Yan, 2024; Sun et al., 2023). Through collaborative discussion and experience sharing, learners negotiate meaning and develop shared understanding. This process supports deeper cognitive engagement and creates a foundation for higher-order thinking.

b. Development of Self-Regulated Learning Processes

A second key finding highlights that sustained engagement in constructivist learning environments fosters the development of self-regulated learning among adult learners (He et al., 2024; Ilishkina et al., 2022; Zimmerman & Schunk D. H., 2011). Learners demonstrate increased capacity to set learning goals, monitor understanding, manage learning strategies, and regulate emotional responses such as frustration or uncertainty.

In non-formal education contexts, where external monitoring is limited, self-regulated learning emerges as a crucial internal mechanism. Adult learners gradually assume greater responsibility for managing learning time, maintaining motivation, and adapting strategies in response to learning challenges.

c. Emergence of Problem-Solving Skills

Problem-solving skills were found to emerge as an integrated outcome of constructivist engagement and self-regulated learning processes (Arruzza et al., 2023; Helmold, 2023; Mahanal et al., 2022). Adult learners who actively regulate their learning are better able to identify problems, explore alternative solutions, evaluate consequences, and make reflective decisions.

Rather than developing as isolated cognitive abilities, problem-solving skills evolve through repeated engagement with authentic problems and reflective regulation of learning processes (Jadhav et al., 2023; Pujiastuti et al., 2025). This highlights the importance of viewing problem-solving as a developmental capability shaped by learning environments and internal regulation.

The findings of this study reinforce the importance of a process-oriented perspective in understanding problem-solving skills development among adult learners in non-formal education. Constructivist learning provides meaningful and contextually rich learning experiences, but its effectiveness depends largely on learners' capacity for self-regulated learning.

From a constructivist standpoint, learning becomes meaningful when adult learners actively interpret experiences and engage in social negotiation of meaning (Cooperstein & Kocevar-Weidinger, 2004; McQueen & McMillan, 2020). In non-formal education, this approach aligns well with adult learners' preference for problem-oriented and experience-based learning. However, the present analysis suggests that constructivist learning alone does not automatically lead to effective problem-solving.

Self-regulated learning plays a critical mediating role by enabling learners to manage cognitive complexity, emotional demands, and uncertainty inherent in real-life problem situations (Llacuna & Mason, 2022; Wolters & Brady, 2021). Adult learners who can regulate effort, maintain focus, and reflect on learning strategies are better positioned to benefit from constructivist learning activities.

Importantly, self-regulated learning in this study is understood as contextually constructed, not as a fixed individual trait (Osakwe et al., 2023; Pan et al., 2025). Non-formal learning environments that emphasize dialogue, reflection, and learner responsibility contribute to the development of self-regulation. This challenges deficit-oriented assumptions that often portray adult learners as lacking academic capability and instead highlights the transformative potential of supportive pedagogical environments.

Within the broader context of educational development, these findings emphasize the strategic role of non-formal education in fostering adaptive competencies. Problem-solving skills are essential for adult learners navigating economic uncertainty, social change, and lifelong

learning demands. Constructivist learning combined with self-regulated learning support positions non-formal education as a space for empowerment rather than remediation.

Conclusion

This study concludes that constructivist learning contributes to the development of problem-solving skills among adult learners in non-formal education primarily through the mediation of self-regulated learning. Constructivist learning environments provide meaningful, experience-based learning opportunities, while self-regulated learning enables learners to manage cognitive, motivational, and emotional challenges during problem-solving processes.

By conceptualizing self-regulated learning as a dynamic and context-dependent process, this article offers a nuanced understanding of adult learning in non-formal settings. Problem-solving skills are not viewed as isolated outcomes but as the result of integrated learning processes involving active engagement, reflection, and self-regulation.

Theoretically, this study contributes to adult education and non-formal education literature by offering a conceptual framework that links constructivist pedagogy, self-regulated learning, and problem-solving skills. Practically, it suggests that non-formal education programs should intentionally design learning activities that promote reflection, learner autonomy, and self-regulation. Future qualitative research may extend this framework through empirical case studies or narrative inquiry to further explore how adult learners experience self-regulated learning within constructivist non-formal education environments.

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