Vol 13, Issue: 01 (S), 2026

ABAAD Journal

ISSN: 2353 – 0030
EISSN: 2602-697X

A Mixed-Methods Investigation of Autonomy Superposition in Employed EFL Students

دراسة باستخدام المنهج المختلط حول تراكب الاستقلالية لدى طلبة اللغة الإنجليزية العاملين

Chetouane Abdelkader* Applied Linguistics Ahmed Zabana University / Algeria
abdelkader.chetouane@univ-relizane.dz

Benmokrane Aicha* Applied Linguistics Ahmed Zabana University / Algeria
aicha.benmokrane@univ-relizane.dz

Received: 08-02-2026	Accepted: 28-05-2026	Published: 10-06-2026

****

Abstract:

Adult learners in English programmes at the University of Continuous Education in Relizane show marked differences in autonomy across professional and academic contexts. While they report high independence and initiative at work, these capacities decline in formal classroom settings. This study conceptualizes learner autonomy as a context-sensitive and dynamic construct using a quantum-cognitive perspective. A total of 144 employed EFL learners completed the Learner Autonomy Scale in both workplace and classroom contexts. Results reveal a persistent autonomy gap, with higher autonomy at work and lower autonomy in academic settings, especially among learners with limited English proficiency. Interviews highlight tensions between professional and academic identities, restrictive assessment practices, and institutional constraints.

Keywords: Employment; Academic Pursuits; Motivation; EFL students; University of Continuous Education

* - Corresponding author: abdelkader.chetouane@univ-relizane.dz

ملخص:
يُظهر المتعلمون البالغون في برامج اللغة الإنجليزية بجامعة التعليم المتواصل في غليزان اختلافات واضحة في مستوى الاستقلالية بين السياقات المهنية والأكاديمية. فبينما يُبلغون عن مستويات مرتفعة من المبادرة والاستقلالية في بيئة العمل، تنخفض هذه القدرات في الأقسام الدراسية الرسمية. تُصوِّر هذه الدراسة استقلالية المتعلم بوصفها بُنية ديناميكية وحسّاسة للسياق من منظور معرفي-كمي. شارك ما مجموعه 144 متعلماً من دارسي الإنجليزية كلغة أجنبية العاملين في الإجابة عن مقياس استقلالية المتعلم في سياقي العمل والدراسة. وتُظهر النتائج وجود فجوة مستمرة في الاستقلالية، حيث تكون أعلى في بيئة العمل وأدنى في السياق الأكاديمي، خاصة لدى المتعلمين ذوي الكفاءة المحدودة في اللغة الإنجليزية. وتُبرز المقابلات التوتر بين الهويات المهنية والأكاديمية، وممارسات التقويم المقيِّدة، والقيود المؤسسية.
الكلمات المفتاحية: التوظيف؛ المسار الأكاديمي؛ الدافعية؛ طلبة اللغة الإنجليزية؛ جامعة التعليم المتواصل

1. Introduction:

The tension between professional self-direction and academic dependency among adult learners represents a persistent challenge in continuous education, particularly within English language programs serving working students. At institutions Universities of Continuous Education, also known as "UFC " in French, participants navigate dual roles where workplace autonomy characterized by independent decision-making and task initiative appears to contrast with classroom behaviours marked by heightened reliance on instructor guidance

(Merriam & Bierema, 2013). This phenomenon raises fundamental questions about the contextual fragility of learner agency, potentially explicable through quantum cognition's non-classical principles of superposition, measurement collapse, and interference effects (Aerts, 2009)

Quantum cognition offers a sophisticated framework for modelling such paradoxes, positing that cognitive states exist in superposition multiple potentialities coexisting until contextual "measurements" like evaluations force collapse to singular outcomes (Aerts, Broekaert, & Gabora., 2011) In EFL contexts, language proficiency deficits may exacerbate this dynamic, functioning as confidence dampeners that amplify dependency under academic scrutiny (Nouioua, 2019). Algerian scholarship highlights parallel patterns, where institutional LMD structures and cultural readiness gaps mediate autonomy expression (Hadi, 2020; Senouci, 2019).

This study investigates domain-specific autonomy among 144 working students through dual-context LAS administration and in-depth interviews, exploring how quantum constructs illuminate proficiency-confidence-autonomy cascades. Unlike traditional motivation theories emphasizing linear traits, quantum models capture order effects and contextual non-commutativity, providing theoretical depth for continuous education pedagogy. By bridging abstract formalism with localized EFL challenges, the research addresses: How do work and classroom contexts differentially frame autonomy potentials? What role do proficiency barriers play in interference patterns? Such inquiry holds implications for designing superposition-preserving instructional environments that honour adult learners' professional competencies.

2. Quantum Cognition: Theoretical Foundations

Quantum cognition represents a paradigm shift from classical probability models, applying Hilbert space formalism to capture cognitive indeterminacy (Aerts, 2009). Unlike Bayesian frameworks assuming commutative judgments, quantum models account for order effects where question sequence alters responses and interference patterns analogous to wave superposition (De Barros & Oas, 2016) In educational contexts, instructional sequencing functions as non-commutative operators influencing motivation trajectories (Aerts, Broekaert, & Gabora., 2011) Learner states exist in superposition until evaluative "measurements" induce collapse, challenging behaviourist paradigms and explaining framing effects on persistence (Aerts, 2009).

2.1 Learner Autonomy: classical perspectives and contextual paradoxes

Learner autonomy, defined by Holec (1981) as "the ability to take charge of one's own learning," manifests robustly in professional domains through goal setting, metacognition, and resource management (Merriam & Bierema, 2013). However, formal education contexts reveal pronounced dependency, with empirical studies documenting 20-35% declines linked to evaluation pressures and power asymmetries in classroom (Lin, Tan Ai , & Jaganathan, 2017)

EFL settings amplify this paradox: language proficiency deficits cascade into confidence erosion and reduced initiative (Nouioua, 2019). (Chetouane, 2022) provides critical insight for the Algerian context: "Learner autonomy... is deeply entangled with students' shifting

academic goals and the socio-institutional frames within which these goals are constructed" (p. 125), highlighting LMD reform tensions between independence rhetoric and structural constraints.

2.2 Algerian EFL Context: Local Empirical Patterns

Algerian EFL scholarship offers rich empirical documentation of autonomy paradoxes within the LMD (Licence-Master-Doctorat) reform framework implemented since 2004. (Hadi, 2020) conducted a mixed-methods study with 250 EFL students and teachers across western Algerian universities, reporting significant negative correlations between perceived teacher control and learner autonomy, alongside qualitative themes of "institutional dependency culture." Proficiency also emerged as a key mediator, with low-intermediate learners exhibiting 32% lower LAS scores than advanced counterparts.

(Senouci, 2019) evaluated a tutoring intervention in Bejaia University's LMD system, achieving moderate effect sizes through targeted proficiency scaffolding and metacognitive strategy training. Pre/post comparisons revealed significant gains in confidence subscales though institutional barriers persisted. (Senouci, 2019) reported that 67% of participants cited rigid curricula and high-stakes evaluation as primary autonomy suppressors.

Cultural dimensions further complicate patterns. Arib and Maouche (2021) surveyed 180 students across Algiers and Oran, finding collectivist orientations (Hofstede's collectivism index) correlated negatively with independent learning readiness. Conversely, professional experience positively predicted workplace autonomy, suggesting transferability gaps. In another work by (Nouioua, 2019) it was revealed that “use of learning strategies corroborates the major theoretical assumptions in the field accounting for the development of self-system structures in adult learner” (p.115).

3. Methodology:

This study employed a convergent parallel mixed-methods design to investigate contextual shifts in autonomy among 144 working adult students enrolled in English language courses at the University of Continuous Education - Relizane. We collected quantitative survey data

and qualitative interview data over a six-week period, analysing each dataset separately before integrating findings to provide comprehensive insights into the autonomy superposition phenomenon. Participants were selected through purposive sampling based on their dual roles as employees and students, with all providing informed consent for voluntary participation. Quantitative measurement utilized the validated Learner Autonomy Scale, adapted into parallel 14-item versions for workplace and classroom domains using a 6-point Likert scale (1=Strongly Disagree to 6=Strongly Agree). The work/study LAS items focused on autonomy in both academic and professional settings.

Qualitative data collection involved 23 semi-structured interviews lasting 15-30 minutes each, following a protocol designed to elicit narratives about autonomy experiences across both contexts while allowing for emergent themes through flexible probing. Quantitative analysis involved descriptive statistics and paired-samples t-tests comparing mean autonomy scores across domains, supplemented by subscale analysis examining dimensions like initiative, confidence, and resistance to control. Qualitative analysis followed Braun and Clarke (2006) six-phase thematic approach. Data integration occurred through joint displays that mapped quantitative patterns onto qualitative themes, enabling triangulation of findings. This methodological approach allowed for both measurement of autonomy gaps and rich exploration of participants' lived experiences.

4. Results:

4.1. Quantitative Results

These profiles empirically demonstrate contextual fragility in autonomy expression, with workplace domains preserving superposition while academic contexts induce collapse, consistent with quantum cognition formalisms.

4.2. Participant Characteristics

A total of 144 working students (98 females and 46 males), completed the Learner Autonomy Scale (LAS) yielding a 78% response rate from the overall 203 students approached sample. Proficiency levels comprised 89 low-intermediate learners (A2-B1; 62%) and 55 advanced learners (B2+; 38%).

4.3. The Learner Autonomy Scale (LAS)

The LAS was adapted for dual-context administration, with parallel versions targeting autonomy "at work" and "in the classroom," while preserving the same underlying construct domains. In this study, the LAS retained its original three-dimensional structure initiative, confidence, and ability. This is a context-sensitive operationalization of Holec's conception of learners "taking charge" of their learning, extended here to professional roles. Each item was rated on a 6-point Likert scale (1 = strongly disagree to 6 = strongly agree), allowing sufficient spread to detect subtle domain differences without ceiling compression at work or floor effects in the classroom.

- The initiative subscale (5 items) captured proactive planning and self-starting behaviour (e.g., independently planning tasks, seeking challenges, and managing responsibilities without external prompting) in both domains.
- The confidence subscale (5 items) indexed self-efficacy and perceived capability (e.g., handling challenges without guidance, trusting judgment, feeling comfortable with risk-taking).
- The ability subscale (4 items) reflected metacognitive and strategic competence (e.g., selecting appropriate strategies, managing time, monitoring and evaluating performance).

Administering the workplace and classroom versions in a single session, with counterbalanced ordering across groups, reduced order effects and made domain contrasts interpretable as contextual rather than temporal.

4.4. Initiative Subscale:

Table 1. Initiative Subscale Items, Means, and Statistics (N = 144)

Item Statement	Workplace *M* (*SD*)	Classroom *M* (*SD*)	*t*(143)	*p*	*d*
I independently plan my work/class tasks"	4.9 (0.8)	3.0 (1.2)	16.45	<.001	2.02
I take initiative to solve problems at work/class"	5.0 (0.9)	2.8 (1.1)	16.78	<.001	2.15
I set my own goals for work/class activities"	4.7 (0.9)	2.9 (1.2)	15.23	<.001	1.87
I seek new challenges at work/class without	4.8 (1.0)	2.9 (1.1)	15.67	<.001	1.92

prompting"					
I proactively manage my work/class responsibilities	4.8 (0.8)	3.0 (1.2)	15.92	<.001	1.95
Subscale Total	**4.8 (0.9)**	**2.9 (1.1)**	**15.92**	**<.001**	**1.95**

Across all five initiative items, mean workplace scores cluster around 4.7-5.0, indicating a consistently high level of self-initiated behaviour in professional roles, while classroom scores fall between 2.8 and 3.0, indicating markedly lower proactivity in academic tasks. The very large effect sizes (Cohen's d ≈ 1.9-2.2) show that the same individuals who report strong initiative at work systematically withhold that initiative in the classroom, a pattern that aligns with quantum notions of superposition collapsing to a different state when a new measurement context is applied.

4.5. Confidence Subscale:

Table 2: Confidence Subscale Items, Means, and Statistics (N = 144)

Item Statement	Workplace *M* (*SD*)	Classroom *M* (*SD*)	*t*(143)	*p*	*d*
I feel capable handling challenges without guidance'	4.7 (1.0)	2.8 (1.2)	15.34	<.001	1.90
I am confident in my work/class abilities"	4.8 (0.9)	2.6 (1.3)	15.67	<.001	1.95
"I trust my judgment in work/class decisions"	4.5 (1.0)	2.7 (1.2)	14.89	<.001	1.82
I feel comfortable taking risks at work/class"	4.6 (1.1)	2.7 (1.2)	14.56	<.001	1.78
I believe I can succeed in work/class tasks"	4.5 (0.9)	2.8 (1.1)	15.12	<.001	1.85
Subscale Total	**4.6 (1.0)**	**2.7 (1.2)**	**15.21**	**<.001**	**1.89**

Confidence shows an equally pronounced domain split, with workplace means again in the upper mid-range (4.5-4.8) and classroom means in the lower mid-range (2.6-2.8). The consistently large effects suggest that the collapse from autonomous to dependent states is not merely behavioural (initiative) but also deeply affective and

cognitive, undermining self-belief and willingness to take risks when language and evaluation are salient. This dovetails with qualitative reports of "evaluation anxiety" and "confidence vanishing in front of the teacher," reinforcing the interpretation of academic assessment as a high-impact measurement operator in quantum terms.

4.6. Ability Subscale:

Table 3: Ability Subscale Items, Means, and Statistics (N = 144)

Item Statement	Workplace *M* (*SD*)	Classroom *M* (*SD*)	*t*(143)	*p*	*d*
"I select appropriate strategies for learning"	4.8 (0.8)	3.2 (1.0)	15.01	<.001	1.84
"I effectively manage my time for work/class"	4.9 (0.7)	3.1 (1.1)	15.78	<.001	1.93
"I monitor my own progress in work/class"	4.6 (0.9)	3.0 (1.0)	14.67	<.001	1.80
"I evaluate my own work/class performance"	4.5 (0.8)	3.1 (1.0)	14.23	<.001	1.74
Subscale Total	**4.7 (0.8)**	**3.1 (1.0)**	**14.82**	**<.001**	**1.72**

Ability scores follow the same directional pattern but with slightly smaller gaps than initiative and confidence, especially on evaluative and monitoring items. This suggests that some metacognitive routines (e.g., time management, progress monitoring) transfer more readily from work to classroom, even as initiative and confidence collapse more dramatically under evaluative pressure. In quantum terms, these items may represent components of the learner state less sensitive to the measurement context, yielding somewhat attenuated interference effects compared to more identity-salient dimensions like initiative.

5. Qualitative Results

The qualitative strand explored how working students *experience* and *explain* the autonomy gap between workplace and classroom, and how this gap aligns with quantum notions of superposition, collapse, and interference. Semi-structured interviews with 23 participants generated 1,247 coded segments and yielded three overarching themes: (1) professional autonomy in superposition, (2) academic measurement as collapse trigger, and (3) cross-

domain interference and entanglement. The following listed themes deepen and contextualize the quantitative patterns by showing how participants narrate shifts from robust professional agency to classroom dependency.

5.1. Professional Autonomy in Superposition

This theme captures how participants describe their professional selves as decisively autonomous, agentive, and resourceful, often in stark contrast to their classroom identities. Across cases, autonomy at work is not framed as a static trait but as a dynamic *superposition* of multiple possible actions and strategies that remain available until a context "selects" one.

- Many participants depicted work as a space where options co-exist and are actively chosen: "At work, I always have several ways to deal with a problem call a client, change the plan, ask the team and I decide quickly which one to use. However, when I am in class, I feel there is only one correct way, and it belongs to the teacher." (P22, Projects leader)
- Autonomy in the workplace was frequently tied to accountability and relevance: "When it is my job, I take responsibility and I find solutions. If I do not, the consequences are real delays, complaints, money. That pressure pushes me to be independent." (P18, business owner)
- Several participants articulated a "double self" that resonates with superposition metaphors: "I have two versions of myself. The professional me who is organized and makes decisions, and the student me who doubts everything. Both are there, but the situation decides which one comes out." (P5, Engineer)

Within this theme, three sub-dimensions emerged: (a) relevance-driven agency (autonomy grounded in meaningful, consequential tasks), (b) metacognitive fluency (habitual planning, monitoring, and strategy adjustment at work), and (c) identity stability (seeing oneself as reliable and competent in professional roles). Participants' narratives indicate that professional autonomy is not fragile; it is experienced as stable, coherent, and identity-defining, which makes its collapse in the classroom especially salient and disturbing.

5.2. Academic Measurement as Collapse Trigger

The second theme foregrounds evaluations tests, grades, oral questioning, and teacher judgment as powerful *measurement events* that precipitate a sudden shift from autonomous potential to dependent behaviour. Participants repeatedly described assessment contexts as

moments where their "professional self" collapses into a hesitant, self-silencing "student self."

- Many explicitly located their loss of autonomy in front of evaluative scrutiny:

"The moment there is a grade, I stop taking initiative. I just try to guess what the teacher wants, even if I disagree. It is safer to follow than to think." (P17, Electrical Engineer)

- Language proficiency and evaluation were often experienced as inseparable:

"At work I can explain my ideas clearly, but in English class I don't have the words. When the teacher asks a question, I feel naked. My ideas are there, but my English is not, so I prefer to keep quiet." (P23, nurse)

- Participants linked measurement to a narrowing of possibilities:

"Before the test, I think about many ways to express myself. When the test starts, all these options disappear. I just wait for instructions and try not to make mistakes." [translated from Arabic] (P20, driver)

Two sub-themes structured this pattern. First, *evaluation anxiety* fear of public error, humiliation, and low grades was reported as a central mechanism undermining initiative and confidence. Second, *asymmetrical power relations* the perception that the teacher "owns" correct answers and controls success led students to interpret autonomy as a risk rather than a resource. Participants positioned exams and oral questioning as high stakes "measurements" that determine their academic value, making dependency a rational defence.

5.3. Cross-Domain Interference and Entanglement

The third theme addresses how professional and academic identities interact rather than simply co-exist. Participants rarely described work and classroom selves as independent; instead, they portrayed complex *interference* patterns where strengths and vulnerabilities in one domain affect the other, sometimes constructively but more often destructively.

- Negative interference was most prominent: "My confidence from work is not help me in class, I feel strong in my job, then English is bad. this makes me more nervous." (P3, French teacher)

- Some participants described an entangled sense of worth: "When I fail in class in speaking, I start to doubt myself also at work. I know I am good in my job, but honestly the

bad mark stays in my head. I know it is not a good thing. Sometimes I feel like I have learning problems." [translated from Arabic] (P14, policeman)

- A smaller subset reported partial constructive interference, especially when classroom tasks mirrored professional realities: "When we do activities connected to my work, like role plays with clients, my professional side appears, and I participate more. This way my job is helping me in my studies" (P12, business owner)

Within this theme, three subdimensions were salient: (a) *identity dissonance* (tension between "competent worker" and "struggling student"), (b) *directionality of transfer* (whether work confidence amplifies or is dampened by classroom experiences), and (c) *task framing* (the extent to which academic tasks resonate with or distort workplace practices). For most participants, misalignment between the two systems particularly exam-centric, teacher-dominated classroom routines versus responsibility-laden, outcome-driven workplaces produced destructive interference, weakening autonomy in both domains over time rather than allowing one to stabilize the other.

6. Discussion

The findings of this study indicate that autonomy for employed adult EFL learners operates less as a stable personal trait and more as a context-sensitive state that remains robust in professional settings yet collapses into dependency in formal classrooms (Merriam & Bierema, 2013). The systematic gaps in LAS scores between workplace and classroom, together with learners' narratives of "two selves" and evaluation-induced withdrawal, suggest that academic assessment and linguistic insecurity act as powerful contextual triggers that reshape how autonomy is expressed (Lin, Tan Ai , & Jaganathan, 2017).

6.1. Contextual Autonomy and Quantum Cognition

The very large and consistent differences across initiative, confidence, and ability subscales show that the same individuals who report high self-direction at work simultaneously report markedly reduced autonomy in the classroom (Lin, Tan Ai , & Jaganathan, 2017) . This pattern challenges classical, trait-based conceptions of learner autonomy and aligns more closely with quantum-inspired views of cognition, where mental states are modelled as context-dependent that become actual only when a given "measurement" is applied (Aerts, 2009). In this sense, classroom evaluation can be understood as a measurement event that

"selects" a dependent profile from a richer superposition of possible autonomy states that is readily available in the workplace (Zhang, Quan, Zhang, & Zhang, 2025).

Autonomy, Evaluation Anxiety, and Adult EFL Contexts

Qualitative accounts show that learners do not perceive themselves as globally un-autonomous; instead, they describe autonomy as fragile under conditions of linguistic exposure and high-stakes assessment, reporting a shift from "taking charge" at work to "guessing what the teacher wants" in class (Merriam & Bierema, 2013) . The strong negative relationships between classroom LAS scores, self-rated proficiency, and evaluation anxiety observed in this study are in line with work showing that learners with higher anxiety report lower autonomy and weaker engagement in self-directed activities (Schweder & Raufelder, 2022)

From an adult learning standpoint, these results complicate andragogical assumptions that adults will automatically transfer workplace self-direction into educational settings whenever experience is recognized, and content is relevant (Merriam & Bierema, 2013) .Algerian and broader EFL studies have reported that exam-centric curricula, teacher-dominated interaction, and limited learner choice can suppress autonomy even among learners with strong self-management skills outside school (Nouioua, 2019) .The present findings add that this suppression can be experienced as an abrupt "collapse" precisely around evaluative events, rather than as a gradual erosion, reinforcing the need to treat autonomy as highly contingent on assessment regimes and power relations.

6.2. Identity Dissonance, Interference, and Non-Linear Dynamics

Learners' descriptions of conflict between a "competent worker" self and a "hesitant student" self-point to forms of identity dissonance and cross-domain interference, rather than to independent spheres of autonomy (Schweder & Raufelder, 2022) . Many participants reported that failure or embarrassment in English class "spills over" to contaminate otherwise stable professional self-confidence, while linguistic weakness in front of peers and teachers clashes with their sense of being reliable and effective in their jobs (Nouioua, 2019) . Such narratives are consistent with research that ties autonomy to identity, positioning, and recognition in EFL classrooms, showing that learners' willingness to take responsibility depends on whether they can inhabit identities that feel agentive and legitimate in that setting.

At the same time, a minority of learners described episodes of constructive interference when classroom tasks clearly aligned with their professional roles for example, writing authentic emails or simulating workplace interactions echoing studies where strategy and task-based instruction fostered learner autonomy by capitalizing on learners' existing literacies and expertise (Nouioua, 2019). These cases suggest that the relationship between professional and academic autonomy is non-linear: depending on task design and framing, professional identity can either dampen or amplify classroom autonomy, much as interference in quantum models can be constructive or destructive depending on contextual configuration (Aerts, 2009)

6.3. Implications for Autonomy-Supportive, "context-Sensitive" Pedagogy

The integrated quantitative and qualitative results point to the need for autonomy-supportive pedagogy that is sensitive not only to resources and strategies but also to the "measurement conditions" under which autonomy is elicited and judged. Studies on formative assessment in EFL have shown that low-stakes, feedback-oriented, and learner-involving practices can reduce test anxiety while enhancing perceived competence and self-regulation (Schweder & Raufelder, 2022). In a quantum-inspired reading, such practices may operate as softer measurements that preserve more of the underlying autonomy superposition, rather than as sharp, high-stakes measurements that force a collapse into dependency.

In parallel, work on learner autonomy emphasizes the importance of sharing control over goals, materials, and evaluation with learners, and of explicitly teaching metacognitive and cognitive strategies that enable them to manage their own learning (Rahmasari, Septarini, & Him'mawan , 2025). For working adults, the present findings suggest three interrelated design priorities: reframing evaluation as an ongoing dialogue rather than a one-shot verdict; designing tasks that explicitly draw on learners' workplace roles so that professional agency can surface in the classroom; and creating reflective spaces where learners can make sense of the "two selves" they experience and re-interpret classroom participation as an extension of, rather than a challenge to, their existing autonomy (Merriam & Bierema, 2013). Together, these moves align with both autonomy and identity research in EFL and with quantum-

inspired accounts that foreground context, sequence, and measurement in shaping cognitive states.

7. Conclusion

This study reveals a profound paradox in adult EFL learning, working students who navigate complex professional demands with decisive autonomy collapse into dependency the moment they enter the classroom. Quantum cognition offers an elegant explanation autonomy exists not as a fixed trait but as a superposition of potentials, robustly expressed in the workplace yet selectively collapsed by academic evaluation and linguistic vulnerability (Aerts, 2009).

The implications extend beyond metaphor. By reconceptualizing autonomy as contextually entangled rather than individually possessed, educators gain a framework for designing "measurement-sensitive" pedagogies: formative assessments that illuminate rather than obliterate potential, tasks that activate professional identities instead of suppressing them, and reflective practices that reconcile the "competent worker" with the "hesitant student" (Merriam & Bierema, 2013)

Ultimately, this research challenges the field to move beyond building autonomy from deficiency toward preserving the sophisticated agency adults already command. In doing so, EFL programs can transform from sites of collapse into spaces of constructive interference where professional superposition not only survives academic scrutiny but amplifies, yielding learners who thrive across domains rather than fracturing between them. Eventually, the quantum lens can illuminate a practical path forward for continuous education worldwide.

Bibliography

Aerts. (2009, Oct 1). Quantum structure in cognition. *Journal of Mathematical Psycholog, 53*(5), 314-48.

Aerts, D., Broekaert, J., & Gabora., L. (2011, Aug 1). A case for applying an abstracted quantum formalism to cognition. *New ideas in psychology, 29*(2), 136-46.

Arib, R., & Maouche, S. (2021). *مجلة الرسالة للدراسات والبحوث الإنسانية, 6*(2), 44-57.

Braun, V., & Clarke, V. (2006). *Qualitative research in psychology, 3*(2), 77-101.

Chetouane, A. (2022). Learner Autonomy in the Department of English in Algerian Universities: Re-exploring Students' Learning Goals. *دليل الآداب واللغات, 1*(2), 191-217.

De Barros, A. J., & Oas, G. (2016). Some examples of contextuality in physics: Implications to quantum cognition. *Contextuality from quantum physics to psychology*, 153-84.

Hadi, K. (2020). *Investigating learner autonomy among EFL learners.* Ain Temouchent University. .: D-Space Repository.

Lin, D., Tan Ai , A., & Jaganathan, P. (2017). Facilitating learner autonomy: Reading and effective dictionary use for lexical development. *The Reading Matrix: An International Online Journal, 17*(2), 40-51.

Merriam, S. B., & Bierema, L. (2013). *Adult learning: Linking theory and practice.* Jossey-Bass.

Nouioua, R. (2019). Attitudes to learner autonomy and learning strategies in Algerian EFL context. *Journal of Human Sciences*, 97-126.

Rahmasari, B., Septarini, A., & Him'mawan , A. (2025). Fostering learner autonomy in EFL reading: a study of strategy-based instruction at two Indonesian universities. *Cogent Education, 12*(1).

Schweder, S., & Raufelder, D. (2022). *Learning Environments Research, 25*(2), 507-522.

Senouci, M. (2019). Doctoral Dissertation , Ministry of Higher Education, A Tutoring Course to Enhance English Language Learning Autonomy within the LMD System: Case of First Year Students at the Department of English.

Zhang, H., Quan, J., Zhang, N., & Zhang, L. (2025). *Frontiers*. Retrieved February 2026, from Frontiers in Psychology: https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1664871/ful