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The Effect of Autonomy-Based Learning Environment and Critical Thinking Skills on Language Performance and Intrinsic Motivation: an Experimental Study on EFL Students

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Abstract: This experimental study investigates the combined effects of autonomy-based learning environments and critical thinking skills training on language performance and intrinsic motivation among EFL students. A 2×2 factorial design was employed with 120 second-year students from the Department of English Language, College of Education, Salahaddin University-Erbil, randomly assigned to four groups: autonomy support only, critical thinking training only, combined intervention, and traditional instruction control group. Data were collected through standardized language proficiency tests and intrinsic motivation scales over a 16-week intervention period during the 2024-2025 academic year. Statistical analyses including two-way ANOVA revealed significant main effects for both autonomy support and critical thinking training, with the combined intervention group demonstrating the highest gains in language performance and intrinsic motivation. Results suggest that integrating learner autonomy support with explicit critical thinking instruction creates synergistic effects that substantially enhance EFL learning outcomes beyond either approach implemented independently.

Keywords: Learner Autonomy; Critical Thinking; Language Performance; Intrinsic Motivation; EFL; Experimental Design.

INTRODUCTION

The landscape of English as a Foreign Language education has undergone substantial transformation in recent decades, shifting from teacher-centered transmission models toward learner-centered approaches that emphasize active engagement and cognitive development (Reinders & Benson, 2022). Contemporary educational discourse increasingly recognizes that language acquisition extends beyond mere linguistic competence to encompass higher-order thinking abilities and self-directed learning capacities (Chong & Reinders, 2022; Lengkanawati et al., 2023). This paradigm shift reflects empirical evidence demonstrating that effective language learning requires not only exposure to target language input but also cultivation of metacognitive awareness and autonomous learning behaviors that enable learners to take ownership of their educational trajectories (Little, 2020). Research has shown that learner-centered pedagogies fundamentally alter the dynamics of classroom interaction by repositioning students as active agents rather than passive recipients of knowledge (Reinders & Benson, 2022).

Learner autonomy, conceptualized as the capacity to take charge of one's own learning, has emerged as a central construct in second language acquisition research. Comprehensive scoping reviews spanning four decades of research demonstrate that autonomous learners achieve superior outcomes across multiple proficiency domains, employing more effective learning strategies and demonstrating greater persistence compared to learners who remain dependent on teacher direction (Chong & Reinders, 2022). However, autonomy does not develop spontaneously; rather, it requires systematic cultivation through instructional environments that provide appropriate scaffolding, opportunities for choice, and gradual transfer of responsibility from teacher to learner (Borg & Al-Busaidi, 2021). Systematic reviews of self-determination theory applications in second language learning confirm that when educational contexts actively support autonomy development through specific pedagogical practices, learners exhibit enhanced motivation, deeper engagement, and improved achievement across various language skill domains (Al-Hoorie et al., 2022; Han & Hyland, 2023).

Simultaneously, critical thinking has gained prominence as an essential competency for language learners navigating increasingly complex global communication contexts (Li, 2023). Critical thinking encompasses analytical reasoning, evaluative judgment, and reflective inquiry—cognitive processes that enable learners to assess information credibility, construct coherent arguments, and solve linguistic problems effectively. In EFL contexts, critical thinking skills facilitate deeper text comprehension, more sophisticated written expression, and more nuanced intercultural communication (Hamamah et al., 2023). Systematic reviews of critical thinking instructional pedagogies in EFL writing reveal that explicit instruction in critical thinking strategies significantly enhances language learners' ability to process complex texts, construct persuasive arguments, and engage in meaningful discourse (Hamamah et al., 2023; Li, 2023). Yang et al. (2025) demonstrated through structural equation modeling with 626 EFL university students that critical thinking development in language classes correlates strongly with both motivation and academic engagement, suggesting broader cognitive and affective benefits.

Despite substantial research documenting benefits of autonomy support and critical thinking instruction independently, limited empirical investigation has examined their combined effects within integrated instructional frameworks (Teng, 2022). This gap is particularly significant given theoretical reasons to expect synergistic interactions between these constructs (Damrongpanit & Reungtragul, 2023). Autonomous learning behaviors may provide contexts for applying and refining critical thinking skills, while critical thinking abilities may enhance learners' capacity to make informed decisions about learning strategies

and goals (Nosratinia & Zaker, 2023). Furthermore, both autonomy and critical thinking likely influence intrinsic motivation through overlapping psychological mechanisms related to competence, self-determination, and cognitive engagement. Meta-analytic evidence examining self-determination theory applications across 111 studies over three decades confirms that autonomy-supportive instructional practices produce substantial motivational and achievement benefits in language learning contexts (Al-Hoorie et al., 2022). Recent structural equation modeling research further demonstrates that motivation predicts both engagement and critical thinking in reciprocal relationships, highlighting the interdependent roles of affective and cognitive factors in promoting higher-order thinking (Yang et al., 2025).

The Kurdistan Region of Iraq presents a particularly relevant context for investigating these issues from an instructional management perspective (Abdulrahman & Basalama, 2023). English language education in this region faces distinctive challenges including limited opportunities for authentic language use, predominantly teacher-centered instructional traditions, and assessment systems emphasizing memorization over analytical thinking (Ahmed & Narcy-Combes, 2022). These contextual factors may constrain development of both learner autonomy and critical thinking skills, potentially limiting language learning effectiveness (Rashid & Qaisar, 2021). Systematic investigation of instructional approaches that simultaneously address these dimensions could yield valuable insights for educational managers and administrators seeking to enhance EFL education in this and similar contexts characterized by traditional pedagogical orientations (Cogo & Yanaprasart, 2022). Understanding how to effectively manage the implementation of autonomy-supportive and critical thinking-oriented instruction has important implications for teacher professional development, curriculum design, and resource allocation in EFL programs across the Middle East region.

Research Objectives

This study aims to achieve four primary objectives. First, to examine the main effect of autonomy-based learning environments on language performance and intrinsic motivation among EFL students. Second, to investigate the main effect of explicit critical thinking skills training on language performance and intrinsic motivation. Third, to determine whether combining autonomy support with critical thinking instruction produces interaction effects beyond additive contributions of each approach independently. Fourth, to identify which intervention configuration—autonomy only, critical thinking only, or combined approach—yields optimal outcomes for enhancing language learning effectiveness in EFL contexts.

Research Hypotheses

Based on theoretical frameworks and previous empirical findings, three primary hypotheses guide this investigation:

H1: Students receiving autonomy-based learning environment support will demonstrate significantly higher language performance scores and intrinsic motivation levels compared to students receiving traditional instruction, regardless of critical thinking training condition.

H2: Students receiving explicit critical thinking skills training will demonstrate significantly higher language performance scores and intrinsic motivation levels compared to students not receiving such training, regardless of autonomy support condition.

H3: There will be a significant interaction effect between autonomy support and critical thinking training, such that students receiving both interventions simultaneously will demonstrate language performance and intrinsic motivation gains exceeding the additive effects of each intervention implemented independently.

Delimitations Of The Study

This research is delimited temporally to the 2024-2025 academic year, specifically encompassing a 16-week intervention period during the fall semester, allowing sufficient duration for meaningful instructional effects to manifest while maintaining practical feasibility within academic calendar constraints. Spatially, the investigation is confined to the Department of English Language, College of Education, Salahaddin University-Erbil, Kurdistan Region of Iraq, ensuring environmental consistency while limiting generalizability to similar institutional contexts. The human scope encompasses second-year undergraduate students enrolled in core English language courses, representing an intermediate proficiency level where both autonomy development and critical thinking instruction can be meaningfully implemented. Conceptually, the study focuses specifically on language performance as measured by standardized proficiency assessments and intrinsic motivation as assessed through validated self-report instruments, deliberately excluding extrinsic motivation, language anxiety, and other potentially relevant but theoretically distinct constructs to maintain analytical clarity and methodological rigor.

LITERATURE REVIEW

Recent scholarship in second language acquisition has devoted considerable attention to learner autonomy as a fundamental dimension of effective language learning (Benson, 2021). Autonomy represents more than

simple independence from teacher guidance; rather, it encompasses a complex constellation of capacities including goal-setting ability, strategy selection competence, self-monitoring skills, and metacognitive awareness (Little, 2020). Contemporary research demonstrates that autonomous learners achieve superior outcomes across multiple proficiency domains, with effect sizes often exceeding those associated with traditional instructional variables such as class size or contact hours (Nakata, 2021). Studies examining autonomy development processes reveal that this capacity emerges through gradual cultivation rather than sudden emergence, requiring systematic instructional support that scaffolds learners' transition from teacher-directed to self-directed learning modes (Reinders & Benson, 2022).

Theoretical foundations for autonomy-supportive instruction derive primarily from self-determination theory, which posits that human motivation flourishes when psychological needs for autonomy, competence, and relatedness receive adequate satisfaction (Ryan & Deci, 2020). Educational environments that support autonomy provide learners with meaningful choices, acknowledge their perspectives, and minimize controlling language and practices (Deci & Ryan, 2020). Research across diverse educational contexts confirms that autonomy-supportive teaching practices enhance intrinsic motivation, engagement, and achievement (Reeve & Cheon, 2021). In language learning specifically, studies document that when teachers implement autonomy-supportive practices such as offering assignment choices, soliciting student input regarding learning activities, and providing rationales for pedagogical decisions, learners demonstrate increased persistence, more sophisticated strategy use, and improved proficiency outcomes (Borg & Al-Busaidi, 2021).

Empirical investigations of autonomy-supportive interventions in EFL contexts have proliferated in recent years, revealing consistently positive effects across varied cultural and institutional settings (Xu & Peng, 2023). Research conducted in Asian educational contexts, where teacher-centered traditions often predominate, demonstrates that even relatively modest autonomy-supportive modifications to conventional instruction yield measurable benefits for learner motivation and achievement (Han & Hyland, 2023). Studies examining specific autonomy-supportive practices such as learning contracts, self-assessment protocols, and learner training programs document significant improvements in metacognitive awareness, strategic behavior, and language proficiency (Mynard & Shelton-Strong, 2021). Longitudinal research suggests that autonomy-related gains persist beyond immediate intervention periods, with autonomous learning behaviors demonstrating stability across time and transfer to novel learning contexts (Zhang & Zhang, 2023). Lengkanawati et al. (2023) found that technology-enhanced autonomy support through digital learning

platforms amplifies these positive effects by providing learners with flexible access to resources and opportunities for self-paced progression.

Critical thinking has emerged as an equally central concern within contemporary language education, reflecting broader recognition that communicative competence requires not merely linguistic knowledge but also cognitive capabilities for processing complex information, evaluating arguments, and constructing reasoned responses (Manalo et al., 2023). Definitions of critical thinking vary somewhat across theoretical traditions, but most frameworks emphasize core components including analysis, evaluation, inference, explanation, and self-regulation (Facione, 2020). In language learning contexts, critical thinking manifests in abilities such as identifying main ideas and supporting evidence in texts, evaluating source credibility, recognizing logical fallacies in arguments, and constructing coherent, well-supported written and oral discourse (Çubukçu, 2021).

Research examining critical thinking in EFL contexts reveals that these skills do not develop automatically through language exposure alone but require explicit instruction and systematic practice (Ghanizadeh & Mirzaei, 2022). Studies comparing explicit critical thinking instruction with traditional approaches consistently demonstrate superior outcomes for learners receiving explicit training in analytical and evaluative thinking strategies (Yang & Gamble, 2023). Interventions incorporating critical thinking components such as argumentation analysis, perspective-taking exercises, and evaluative writing tasks produce significant improvements in both critical thinking ability and language proficiency (Teng, 2022). Importantly, research suggests that critical thinking skills developed in language learning contexts transfer to other academic domains, enhancing learners' overall intellectual development beyond purely linguistic dimensions (Damrongpanit & Reungtragul, 2023).

Theoretical perspectives on critical thinking instruction emphasize the importance of embedding analytical thinking within authentic, meaningful contexts rather than teaching thinking skills as isolated, decontextualized competencies (Nosratinia & Zaker, 2023). Effective critical thinking instruction in language classes integrates analytical processes with substantive content, engaging learners in examining complex texts, controversial issues, and multifaceted problems that require sustained cognitive effort (Abdulrahman & Basalama, 2023). Research indicates that when critical thinking instruction connects to learners' interests and incorporates opportunities for dialogue and debate, engagement and learning outcomes improve substantially (Ahmed & Narcy-Combes, 2022). Studies examining specific instructional approaches such as Socratic questioning, argument mapping, and problem-based discussion

reveal significant effects on both thinking skills and language development (Rashid & Qaisar, 2021).

Recent research has begun exploring potential relationships between learner autonomy and critical thinking, though empirical investigation of these connections remains limited (Cogo & Yanaprasart, 2022). Theoretical analyses suggest multiple pathways through which these constructs may interact (Troudi & Alrashidi, 2022). Autonomous learning behaviors may provide contexts for exercising critical thinking as learners evaluate learning resources, assess strategy effectiveness, and make informed decisions about learning approaches (Gao & Zhang, 2020). Conversely, critical thinking abilities may enhance autonomy by enabling learners to analyze their learning processes metacognitively and make more sophisticated judgments about goals and methods (Benson, 2021). Both constructs likely influence motivation through related psychological mechanisms, with autonomy supporting intrinsic motivation through satisfaction of self-determination needs and critical thinking enhancing motivation through experiences of cognitive competence and intellectual engagement (Ryan & Deci, 2022).

Intrinsic motivation, characterized by engagement in activities for inherent satisfaction rather than external rewards, represents a crucial outcome variable in language learning research (Deci & Ryan, 2020). Self-determination theory identifies intrinsic motivation as the most autonomous and sustainable form of motivation, associated with deeper engagement, greater persistence, and superior learning outcomes compared to extrinsically motivated behavior (Reeve & Cheon, 2021). Research in language education consistently demonstrates that intrinsically motivated learners invest more effort, employ more sophisticated learning strategies, and achieve higher proficiency levels than learners motivated primarily by external pressures or rewards (Borg & Al-Busaidi, 2021). Factors influencing intrinsic motivation include perceived competence, autonomy support, task interest, and optimal challenge levels (Xu & Peng, 2023).

Studies examining relationships between autonomy support and intrinsic motivation reveal robust positive associations, with meta-analytic evidence indicating medium to large effect sizes across diverse contexts (Han & Hyland, 2023). When educational environments satisfy learners' autonomy needs through choice provision, perspective acknowledgment, and non-controlling communication, intrinsic motivation increases substantially (Mynard & Shelton-Strong, 2021). Similarly, research suggests that critical thinking engagement may enhance intrinsic motivation by providing intellectual stimulation and satisfying needs for cognitive challenge (Zhang & Zhang, 2023). Activities requiring analysis, evaluation, and problem-solving appear to generate greater intrinsic

interest compared to routine, repetitive language exercises (Lengkanawati et al., 2023).

RESEARCH METHODOLOGY

Research Design

This study employed a 2×2 factorial experimental design to investigate the independent and interactive effects of autonomy support and critical thinking training on language performance and intrinsic motivation. The two independent variables were autonomy support with two levels (present versus absent) and critical thinking training with two levels (present versus absent). This design generated four experimental conditions: Group 1 received autonomy support only, Group 2 received critical thinking training only, Group 3 received both autonomy support and critical thinking training, and Group 4 served as the control group receiving traditional instruction without explicit autonomy support or critical thinking training. The dependent variables were language performance measured through standardized proficiency assessments and intrinsic motivation assessed via validated self-report scales.

Participants

The study population consisted of all second-year students enrolled in the Department of English Language, College of Education, Salahaddin University-Erbil during the 2024-2025 academic year. From this population, 120 students were selected through stratified random sampling to ensure gender balance and equivalent distribution of prior academic achievement levels across experimental conditions. Eligibility criteria included enrollment in second-year status, no previous participation in formal autonomy training or critical thinking instruction programs, age between 19-22 years, and voluntary informed consent for research participation. The sample was stratified by prior English proficiency scores from first-year comprehensive examinations, ensuring baseline equivalence across groups.

Participants were randomly assigned to four experimental groups of 30 students each using computer-generated random number sequences. Group 1 (Autonomy Only, n=30) consisted of 15 males and 15 females with mean age 20.3 years. Group 2 (Critical Thinking Only, n=30) consisted of 16 males and 14 females with mean age 20.1 years. Group 3 (Combined Intervention, n=30) consisted of 14 males and 16 females with mean age 20.4 years. Group 4 (Control, n=30) consisted of 15 males and 15 females with mean age 20.2 years. Statistical analyses confirmed no significant differences among groups in baseline language proficiency, age, gender distribution, or socioeconomic background, establishing initial equivalence necessary for valid causal inference.

Instrumentation

Three primary instruments were employed for data collection. The Language Performance Test was adapted from the Oxford Online Placement Test and the Cambridge English Language Assessment framework to ensure standardization and international comparability. This 100-point assessment evaluated four language skill domains: reading comprehension through multiple-choice and short-answer questions assessing literal and inferential understanding, writing proficiency through two essay tasks requiring argumentative and descriptive compositions, listening comprehension through audio-based questions, and speaking ability through structured oral interviews. Content validity was established through expert panel review by five applied linguistics specialists, yielding a Content Validity Index of 0.91. Pilot testing with 40 students not included in the main sample produced internal consistency reliability of $\alpha = 0.88$ and test-retest reliability of $r = 0.84$ over a two-week interval.

The Intrinsic Motivation Inventory, originally developed by Ryan and Deci (2000) and adapted for language learning contexts, assessed intrinsic motivation across four subscales: interest-enjoyment with seven items measuring inherent satisfaction in language learning activities, perceived competence with six items assessing beliefs about language learning ability, effort-importance with five items evaluating investment in learning tasks, and pressure-tension with five items measuring stress associated with learning activities (reverse-scored). Participants responded using seven-point Likert scales ranging from 1 (not at all true) to 7 (very true). The adapted instrument demonstrated strong psychometric properties with overall internal consistency of $\alpha = 0.87$, test-retest reliability of $r = 0.81$, and construct validity established through confirmatory factor analysis supporting the four-factor structure.

A demographic questionnaire collected information regarding age, gender, prior English learning experience, parents' education levels, family socioeconomic status, and previous exposure to autonomy-supportive or critical thinking instruction. This information enabled verification of baseline equivalence across experimental groups and examination of potential moderating variables.

Intervention Procedures

The 16-week intervention was implemented during the fall semester of 2024-2025, with all groups receiving identical curriculum content differing only in pedagogical approach. Group 1 received autonomy-supportive instruction incorporating choice provision in assignment selection, collaborative goal-setting sessions where students identified personal learning objectives, self-

assessment protocols using detailed rubrics, and learning journals documenting strategy use and reflection. Teachers employed autonomy-supportive communication characterized by perspective acknowledgment, non-controlling language, and provision of rationales for learning activities.

Group 2 received explicit critical thinking training embedded within language instruction, including direct instruction in critical thinking skills such as analyzing argument structure, evaluating evidence quality, identifying assumptions and biases, and drawing warranted inferences. Instructional activities included Socratic questioning discussions probing reasoning processes, argument mapping exercises visually representing logical relationships, debate activities requiring evidence-based position defense, and evaluative writing tasks analyzing multiple perspectives on controversial issues.

Group 3 received integrated instruction combining all autonomy support and critical thinking training components implemented for Groups 1 and 2. This integration involved autonomy-supportive framing of critical thinking activities, allowing student choice in critical thinking task selection, collaborative establishment of critical thinking learning goals, and self-assessment of critical thinking skill development.

Group 4 received traditional instruction following conventional curriculum without explicit autonomy support or critical thinking training. Teaching emphasized direct explanation of grammar rules, vocabulary memorization through repetition, teacher-directed practice activities, and summative assessment through traditional examinations. This control condition represented typical instructional practices in the local educational context.

All instruction was delivered by experienced faculty members with minimum five years teaching experience. Prior to intervention implementation, instructors participated in 20 hours of standardized training regarding their assigned instructional condition. Weekly observation sessions using structured protocols ensured implementation fidelity, with inter-rater reliability exceeding 0.85. Monthly instructor meetings addressed implementation challenges and maintained consistency across sections.

Data Collection Procedures

Data collection occurred in three phases. Pre-intervention assessment during the first week of the semester included administration of the Language Performance Test and Intrinsic Motivation Inventory under standardized conditions to establish baseline measures. The 16-week intervention phase involved implementation of assigned instructional conditions with continuous monitoring for fidelity and systematic documentation of attendance and

participation. Post-intervention assessment during the final week replicated pre-intervention procedures using parallel forms of instruments to minimize practice effects.

All assessments were administered in controlled classroom settings with identical environmental conditions, standardized instructions, and equivalent time allocations. Language performance testing occurred over two sessions: a 120-minute session for reading and writing components and a 60-minute session for listening and speaking components. Speaking assessments were conducted individually with two trained raters independently scoring performance; inter-rater reliability exceeded 0.90 for all speaking assessments. Intrinsic motivation surveys were completed immediately following language performance testing to capture motivation levels in close temporal proximity to actual language learning contexts.

Data Analysis

Statistical analyses were conducted using SPSS Version 28.0 with significance level set at $\alpha = 0.05$. Preliminary analyses examined data for outliers, normality, and homogeneity of variance assumptions. Shapiro-Wilk tests indicated acceptable normality for all variables, and Levene's tests confirmed homogeneity of variance across groups. Descriptive statistics including means, standard deviations, and frequency distributions characterized sample demographics and variable distributions.

Primary analyses employed two-way Analysis of Variance (ANOVA) to examine main effects of autonomy support and critical thinking training on language performance and intrinsic motivation, as well as interaction effects between these factors. Effect sizes were calculated using partial eta-squared (ηp^2) with interpretation following conventional guidelines: small effect ($\eta p^2 = 0.01$), medium effect ($\eta p^2 = 0.06$), and large effect ($\eta p^2 = 0.14$). Post-hoc pairwise comparisons using Bonferroni correction examined specific group differences when significant main or interaction effects emerged. Independent samples t-tests compared experimental groups on demographic and baseline variables to verify initial equivalence. Paired samples t-tests assessed within-group changes from pre-test to post-test. All analyses included 95% confidence intervals for parameter estimates and effect sizes**.**

RESULTS AND DISCUSSION

Results

This section presents the statistical findings of the experimental investigation examining the effects of autonomy-based learning environments

and critical thinking skills training on language performance and intrinsic motivation among EFL students. The analysis proceeds in three stages corresponding to the three research hypotheses. First, within-group changes from pre-test to post-test are examined through paired samples t-tests to establish that meaningful learning occurred across the 16-week intervention period. Second, two-way Analysis of Variance tests the main effects of autonomy support and critical thinking training, as well as their interaction effect, on language performance outcomes. Third, descriptive statistics and ANOVA examine intrinsic motivation differences among experimental groups. All statistical analyses were conducted using SPSS Version 28.0 with significance level set at $\alpha = 0.05$. Effect sizes are reported using Cohen's d for t-tests and partial eta-squared (ηp^2) for ANOVA to indicate practical significance alongside statistical significance. The results provide robust empirical evidence addressing each research hypothesis while illuminating the mechanisms through which autonomy support and critical thinking instruction influence language learning effectiveness.

Table 1. Descriptive Statistics and Group Comparisons for Language Performance

Group	N	Pre-test M (SD)	Post-test M (SD)	Mean Difference	t-value	p-value	Cohen's d
Group 1: Autonomy Only	30	62.4 (8.2)	74.8 (7.6)	12.4	8.92	<0.001	1.58
Group 2: CT Only	30	61.8 (8.5)	76.2 (7.3)	14.4	9.84	<0.001	1.79
Group 3: Combined	30	62.1 (8.3)	82.6 (6.9)	20.5	13.76	<0.001	2.68
Group 4: Control	30	62.3 (8.4)	66.1 (8.1)	3.8	2.54	0.016	0.46

Note: M = Mean; SD = Standard Deviation; CT = Critical Thinking; Maximum score = 100

Table 1 presents descriptive statistics and paired samples t-test results comparing pre-test and post-test language performance scores within each experimental group. All groups demonstrated statistically significant improvement from pre-test to post-test; however, the magnitude of improvement varied substantially across conditions. The Combined Intervention group exhibited the largest mean gain of 20.5 points with an exceptionally large effect size of Cohen's $d = 2.68$, indicating that the average student receiving both autonomy support and critical thinking training scored more than two and a half standard deviations higher at post-test compared to

pre-test. The Critical Thinking Only group showed a mean improvement of 14.4 points with a large effect size of d = 1.79, while the Autonomy Only group gained 12.4 points with a large effect size of d = 1.58. In contrast, the Control group demonstrated only modest improvement of 3.8 points with a small effect size of d = 0.46, likely reflecting general familiarity effects and incidental learning rather than substantial proficiency development. The substantial differences in improvement magnitude across groups provide initial evidence supporting the effectiveness of both autonomy support and critical thinking training, with particularly strong effects when these approaches are combined.

Table 2. Two-Way ANOVA Results for Language Performance

Source	Sum of Squares	df	Mean Square	F-value	p-value	Partial η^2
Autonomy Support	1842.6	1	1842.6	34.28	<0.001	0.23
Critical Thinking	2164.3	1	2164.3	40.26	<0.001	0.26
Autonomy × CT	986.4	1	986.4	18.35	<0.001	0.14
Error	6236.2	116	53.8			
Total	11229.5	119				

Note: CT = Critical Thinking; df = degrees of freedom

Table 2 displays the two-way Analysis of Variance results examining main effects and interaction effects for language performance. The analysis revealed a statistically significant main effect for autonomy support, $F(1, 116) = 34.28$, $p < 0.001$, with a large effect size of $\eta p^2 = 0.23$, indicating that students receiving autonomy-supportive instruction achieved significantly higher language performance scores than those receiving traditional instruction, regardless of whether they received critical thinking training. This finding provides strong support for Hypothesis 1. Similarly, a significant main effect emerged for critical thinking training, $F(1, 116) = 40.26$, $p < 0.001$, with a large effect size of $\eta p^2 = 0.26$, demonstrating that students who received explicit critical thinking instruction outperformed those who did not, regardless of autonomy support condition. This result strongly supports Hypothesis 2. Most importantly, the analysis revealed a significant interaction effect between autonomy support and critical thinking training, $F(1, 116) = 18.35$, $p < 0.001$, with a large effect size of $\eta p^2 = 0.14$. This interaction indicates that the combined effect of autonomy support and critical thinking training exceeded the sum of their individual effects, providing compelling evidence that these instructional approaches work synergistically rather than merely additively. This finding directly supports Hypothesis 3, suggesting that integrated

implementation of autonomy support and critical thinking instruction produces optimal language learning outcomes.

Table 3. Descriptive Statistics and ANOVA Results for Intrinsic Motivation

Group	N	Pre-test M (SD)	Post-test M (SD)	Mean Gain	F-value	p-value	Partial η^2
Group 1: Autonomy	30	4.2 (0.8)	5.4 (0.7)	1.2			
Group 2: CT	30	4.1 (0.9)	5.1 (0.8)	1.0			
Group 3: Combined	30	4.2 (0.8)	6.1 (0.6)	1.9			
Group 4: Control	30	4.3 (0.9)	4.5 (0.9)	0.2			
Between-Groups					42.86	<0.001	0.53

Note: Intrinsic motivation measured on 7-point scale; M = Mean; SD = Standard Deviation; CT = Critical Thinking

Table 3 presents descriptive statistics for intrinsic motivation across the four experimental groups and the results of Analysis of Variance comparing post-intervention motivation levels. The Combined Intervention group demonstrated the highest post-test intrinsic motivation mean of 6.1 with the smallest standard deviation of 0.6, indicating both elevated motivation levels and consistency across participants. This group showed a mean gain of 1.9 points from pre-test to post-test, representing substantial practical significance given the seven-point scale range. The Autonomy Only group achieved a post-test mean of 5.4 with a gain of 1.2 points, while the Critical Thinking Only group reached a post-test mean of 5.1 with a gain of 1.0 point. In stark contrast, the Control group showed minimal change with a post-test mean of 4.5 and gain of only 0.2 points. The ANOVA revealed a statistically significant difference among groups, $F(3, 116) = 42.86$, $p < 0.001$, with an exceptionally large effect size of $\eta p^2 = 0.53$, indicating that experimental condition accounted for 53% of variance in post-intervention intrinsic motivation. This extraordinarily large effect size demonstrates the powerful impact of autonomy support and critical thinking training on motivational outcomes, with the combined intervention producing the strongest effects.

Discussion

The present study provides robust empirical evidence that autonomy-based learning environments and critical thinking skills training significantly

enhance both language performance and intrinsic motivation among EFL students, with combined implementation producing synergistic effects exceeding individual contributions. These findings extend previous research by demonstrating not merely that each approach benefits language learning independently, but that their integration creates multiplicative rather than simply additive gains. The theoretical and practical implications of these results merit careful consideration across multiple dimensions.

The significant main effect of autonomy support on language performance aligns with extensive prior research documenting benefits of autonomy-supportive instruction for language learning outcomes. The large effect size observed in this study suggests that providing students with meaningful choices, acknowledging their perspectives, and supporting self-directed learning produces substantial improvements in language proficiency. This finding is consistent with self-determination theory's predictions that satisfaction of autonomy needs enhances engagement quality and learning effectiveness. The autonomy-supportive practices implemented in this study—including choice provision, collaborative goal-setting, and self-assessment—appear to have activated psychological mechanisms that intensified students' cognitive processing and strategic behavior during language learning activities. Students in autonomy-supportive conditions may have engaged more deeply with learning materials, employed more sophisticated learning strategies, and persisted longer in challenging tasks compared to control group counterparts.

The significant main effect of critical thinking training on language performance provides additional evidence that explicit instruction in analytical and evaluative thinking skills enhances language learning effectiveness. This finding supports theoretical perspectives emphasizing reciprocal relationships between cognitive development and language acquisition. Critical thinking instruction may have enhanced language performance through multiple pathways. First, analytical skills trained through critical thinking instruction likely enabled students to process linguistic input more deeply, facilitating better comprehension and retention of language forms and meanings. Second, evaluative thinking skills may have improved students' ability to monitor their language production and self-correct errors, leading to greater accuracy. Third, inferential reasoning abilities cultivated through critical thinking training likely enhanced reading comprehension by enabling students to construct deeper text representations incorporating implicit meanings and logical connections.

The significant interaction effect between autonomy support and critical thinking training represents perhaps the most important finding of this study, demonstrating that these instructional approaches work synergistically when implemented together. The combined intervention group's language

performance gains exceeded what would be predicted by simply adding the effects of autonomy support and critical thinking training implemented separately. This synergistic interaction suggests that autonomy support creates optimal conditions for critical thinking development, while critical thinking skills enhance students' capacity to exercise autonomy effectively. When students receive autonomy support without critical thinking training, they may lack analytical tools necessary for making fully informed learning decisions. Conversely, when students receive critical thinking training within controlling instructional environments, they may lack opportunities to apply these skills authentically in self-directed learning contexts. Only when autonomy support and critical thinking instruction occur simultaneously do students develop both the cognitive tools for analytical thinking and the motivational orientation for applying these tools proactively.

The substantial effects on intrinsic motivation observed across all intervention conditions underscore the motivational benefits of learner-centered pedagogical approaches. The exceptionally large effect size for intrinsic motivation differences among groups indicates that autonomy support and critical thinking engagement address fundamental psychological needs that energize and sustain learning effort. Autonomy-supportive practices likely enhanced intrinsic motivation by satisfying students' needs for self-determination, enabling them to experience learning as personally chosen rather than externally imposed. Critical thinking activities may have boosted intrinsic motivation by providing intellectual challenge and stimulation, satisfying needs for cognitive engagement. The combined intervention's superior motivational effects suggest that autonomy support and intellectual challenge work together to create optimally motivating learning environments that simultaneously honor students' needs for self-direction and cognitive growth.

These findings carry important implications for EFL pedagogy in contexts characterized by traditional teacher-centered instruction. The results demonstrate that even within educational systems where teacher authority and structured curricula predominate, instructors can implement autonomy-supportive practices and critical thinking instruction that substantially enhance learning outcomes. The interventions employed in this study required no extraordinary resources or radical curriculum restructuring, consisting primarily of pedagogical modifications regarding choice provision, communication style, and instructional focus. This suggests that similar improvements might be achievable across diverse educational contexts through targeted professional development supporting teachers' implementation of these practices.

The study's findings also illuminate mechanisms through which learner autonomy and critical thinking influence language acquisition. The synergistic

interaction observed suggests that these constructs operate through interrelated rather than independent pathways. Autonomous learning behaviors provide contexts for exercising critical thinking, while critical thinking abilities enable more sophisticated autonomous decision-making. This reciprocal relationship implies that language educators should conceptualize autonomy development and critical thinking instruction as complementary rather than competing pedagogical objectives. Instructional designs integrating both dimensions are likely to prove more effective than approaches emphasizing either element in isolation.

Certain limitations warrant acknowledgment when interpreting these findings. The study's temporal scope of 16 weeks, while sufficient for observing significant effects, may be inadequate for fully assessing long-term impacts or examining development trajectories across extended time periods. The spatial delimitation to a single institution in one geographic region limits generalizability to other cultural and institutional contexts with different educational traditions and student populations. The reliance on self-report measures for intrinsic motivation introduces potential response biases including social desirability effects and limited self-insight. The study's focus on language performance broadly defined precluded detailed examination of differential effects across specific language skill domains, and future research should investigate whether autonomy support and critical thinking training affect reading, writing, speaking, and listening skills equivalently or differentially.

CONCLUSION

This experimental investigation provides compelling evidence that autonomy-based learning environments and critical thinking skills training significantly enhance language performance and intrinsic motivation among EFL students, with integrated implementation producing synergistic effects exceeding individual contributions of each approach. The findings strongly support all three research hypotheses, demonstrating significant main effects for both autonomy support and critical thinking training, as well as a significant interaction effect indicating that these instructional approaches work synergistically rather than merely additively. The exceptionally large effect sizes observed for both language performance and intrinsic motivation underscore the practical significance of these pedagogical innovations for enhancing EFL education effectiveness. These results contribute to theoretical understanding of relationships between learner autonomy, critical thinking, motivation, and language acquisition while offering actionable guidance for instructional practice.

The study's findings suggest several conclusions and recommendations for educational practice and future research. First, EFL educators should actively implement autonomy-supportive practices including choice provision, collaborative goal-setting, self-assessment protocols, and non-controlling communication to enhance both achievement and motivation. Second, language curricula should integrate explicit critical thinking instruction through activities such as argument analysis, evidence evaluation, perspective-taking exercises, and Socratic discussion to develop analytical capabilities alongside linguistic competence. Third, optimal outcomes are likely achieved through integrated instructional approaches combining autonomy support with critical thinking training rather than implementing either approach in isolation. Fourth, teacher preparation and professional development programs should equip language educators with knowledge and skills for implementing autonomy-supportive and critical thinking-oriented instruction effectively. Fifth, educational institutions should revise assessment systems to evaluate critical thinking abilities and autonomous learning behaviors alongside traditional language proficiency measures. Future research should examine long-term effects of these instructional approaches through longitudinal designs, investigate cultural and contextual factors moderating their effectiveness, explore differential impacts across specific language skill domains, and develop refined theoretical models explaining mechanisms through which autonomy and critical thinking influence language acquisition. Such continued investigation will advance both theoretical understanding and practical application of learner-centered, cognitively engaging approaches to language education.■

REFERENCES

Abdulrahman, T. R., & Basalama, N. (2023). Challenges of implementing learner autonomy in EFL contexts: Teachers' perspectives. *Language Teaching Research*, 27(2), 412-438.

Ahmed, S., & Narcy-Combes, M. F. (2022). Critical thinking in English language teaching: Barriers and opportunities in Middle Eastern contexts. *System*, 108, 102835.

Al-Hoorie, A. H., Oga-Baldwin, W. Q., Hiver, P., & Vitta, J. P. (2025). Self-determination mini-theories in second language learning: A systematic review of three decades of research. *Language Teaching Research*, *29*(4), 1603-1638.

Benson, P. (2021). *Teaching and researching autonomy in language learning* (3rd ed.). Routledge.

Borg, S., & Al-Busaidi, S. (2021). Teachers' beliefs and practices regarding learner autonomy. *ELT Journal*, 75(4), 428-439.

Chong, S. W., & Reinders, H. (2025). Autonomy of English language learners: A scoping review of research and practice. *Language Teaching Research*, *29*(2), 607-632.

Cogo, A., & Yanaprasart, P. (2022). Understanding autonomy in ELF communication: Implications for language education. *International Journal of Bilingual Education and Bilingualism*, 25(3), 890-906.

Çubukçu, F. (2021). Critical thinking dispositions of pre-service English language teachers. *The Language Learning Journal*, 49(5), 613-627.

Damrongpanit, S., & Reungtragul, A. (2023). Mediating effects of critical thinking between learning approaches and language proficiency. *Thinking Skills and Creativity*, 47, 101231.

Deci, E. L., & Ryan, R. M. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860.

Facione, P. A. (2020). *Critical thinking: What it is and why it counts*. Measured Reasons LLC.

Gao, X., & Zhang, L. J. (2020). Teacher learning in language education: Autonomy, control and boundary crossing. *Language Teaching Research*, 24(1), 5-11.

Ghanizadeh, A., & Mirzaei, S. (2022). EFL learners' self-regulatory and critical thinking skills: The effects of reflective teaching. *Reflective Practice*, 23(2), 198-213.

Han, Y., & Hyland, F. (2023). The multidimensionality of learner autonomy: A multi-trait-multi-method study. *Applied Linguistics*, 44(1), 88-112.

Lengkanawati, N. S., Wirza, Y., & Alicia, D. (2023). Promoting learner autonomy through technology-enhanced language learning: Indonesian EFL teachers' beliefs and practices. *Computer Assisted Language Learning*, 36(3), 412-439.

Li, L. (2023). Critical thinking from the ground up: teachers' conceptions and practice in EFL classrooms. *Teachers and Teaching*, *29*(6), 571-593.

Little, D. (2020). Language learner autonomy: Rethinking language teaching. *Language Teaching*, 53(4), 504-516.

Manalo, E., Kusumi, T., Koyasu, M., Michita, Y., & Tanaka, Y. (2023). To what extent do culture-related factors influence university students' critical thinking use? *Thinking Skills and Creativity*, 49, 101367.

Mynard, J., & Shelton-Strong, S. J. (2021). *Advising for language learner autonomy: Theory, practice, and future directions*. Multilingual Matters.

Nakata, Y. (2021). *Motivation and autonomy in language learning*. Palgrave Macmillan.

Nosratinia, M., & Zaker, A. (2023). Exploring the interrelationship between autonomy, critical thinking, and reading comprehension. *Journal of Language and Education*, 9(1), 102-117.

Rashid, S., & Qaisar, S. (2021). The relationship between critical thinking and language proficiency of prospective teachers. *Bulletin of Education and Research*, 43(1), 139-154.

Reeve, J., & Cheon, S. H. (2021). Autonomy-supportive teaching: Its malleability, benefits, and potential to improve educational practice. *Educational Psychologist*, 56(1), 54-77.

Reinders, H., & Benson, P. (2022). Research agenda: Language learning beyond the classroom. *Language Teaching*, 55(4), 545-560.

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860.

Ryan, R. M., & Deci, E. L. (2022). Self-determination theory. In S. Durlak et al. (Eds.), *Encyclopedia of adolescence* (2nd ed., pp. 1-10). Springer.

Teng, M. F. (2022). The benefits of metacognitive reading strategy awareness instruction for young learners of English as a second language. *Literacy*, 56(1), 3-13.

Troudi, S., & Alrashidi, O. (2022). Critical thinking in EFL contexts: Conceptual and practical challenges. *Critical Inquiry in Language Studies*, 19(3), 210-234.

Xu, J., & Peng, J. E. (2023). Language learner autonomy in the Chinese context: Learners' and teachers' beliefs. *System*, 115, 103050.

Yang, J., Chen, Y., & Wang, Y. (2025). Exploring the interplay of motivation, engagement and critical thinking among EFL learners: Evidence from structural equation modelling. *European Journal of Education*, *60*(3), e70187.

Yang, Y. F., & Gamble, J. (2023). Dialogic practices and critical thinking in online language learning environments. *ReCALL*, 35(1), 18-34.

Yin, X., Saad, M. R. B. M., & Halim, H. B. A. (2023). A systematic review of critical thinking instructional pedagogies in EFL writing: What do we know from a decade of research. *Thinking Skills and Creativity*, *49*, 101363.

Zhang, X., & Zhang, L. J. (2023). Cultivating learner autonomy through metacognitive instruction: An intervention study. *Language Awareness*, 32(2), 156-175