Available on: https://jsshrs.ep-journals.org/ E-ISSN: 3051-3561 P-ISSN: 3051-3553

Journal of Social Science and Human Research Studies
Volume: 02 Issue: 03 March-2026

The Impact of Learner Autonomy on Critical Thinking Performance in an EFL Context

Iman Albakkosh
Lecturer at the university of Tripoli

Mark Lloyd
Kaplan International City of Bath UK

Published Date: March 16, 2026 **Article DOI: 10.65150/EP-jsshrs/V2E3/2026-06**

ABSTRACT: The present quantitative study explores the influence of certain elements of autonomous learning (*goal setting, reflective learning, self-efficacy, decision making*) on critical thinking skills in an EFL context. The sampled learners were 76 Libyan university EFL students, and the data was collected through a structured Likert scale questionnaire that was distributed online. The results of the study show that critical thinking skills have a strong correlation with reflective thinking and decision-making. On the other hand, self-efficacy and goal setting have the weakest correlation with critical thinking skills.

KEYWORDS: Autonomous learning, EFL learning, Libyan EFL learners; critical thinking skills; self-efficacy; decision making; goal setting; reflective thinking

1.1. INTRODUCTION

In English language teaching and learning, autonomy has been a vital component since the late 1970s of the 20th century, and has been extensively explored and theorized (Little, 1995). Moreover, a significant number of studies on autonomous learning have been conducted (e.g. Dafei,2007; Haque, et al., 2023; Huang & Benson, 2013; Liu, et al., 2024; Yang et al., 2022; Liu, et al 2024). Similarly, there has been an extensive focus on critical thinking (CT) in EFL contexts (e.g. Facione, 1990; Alnofaie, 2013; Sobkowiak, 2016; Huang et al., 2023; Liang & Fung, 2021; Pang, 2022). However, less focus was given to investigating the type of relationship between the two concepts, and limited examples are found that explored the link between the two concepts.

Examples of studies linking the two notions are done by; Zaker and Nosratinia in 2013, 2015, 2015, and Soyhan in 2020. Zakar and Nosratinia reported strong correlational relationship between autonomy and critical thinking, and they found that high levels of critical thinking can predict levels of autonomy in learners (Zaker & Nosratinia, 2013; Zaker & Nosratinia, 2015; Nosratinia et al., 2015). Similarly, a study by Soyhan (2020) done on Japanese students found that students' levels of autonomy influence the levels of critical thinking.

Critical thinking and autonomy are constructs that have many underlying components such as self-direction, reflection, assessment and evaluation, decision making (Soyhan, 2020; Veettil and Binu, 2022). In the above studies the interrelationship between the two concepts has been established, however, the two concepts have not been thoroughly examined regarding what specific aspects of either concept influence the other. Therefore, the present study intends to address the link between the two concepts by exploring the influence of different aspects of autonomous language learning (self-efficacy, goal setting, reflective thinking, and decision making) on students' critical thinking. The researchers hope that the results of the current study will help to develop a general understanding of the specific links between certain aspects of autonomy and critical thinking abilities as defined in this study.

LITERATURE REVIEW

Theoretical framework

Firstly, self-determination theory (SDT), formulated by Deci and Ryan (1985), focuses on the nourishment of learners' intrinsic motivation. According to Deci and Ryan, intrinsic motivation is a stronger driving force than extrinsic motivation. They state that; "Comparisons between people whose motivation is authentic (literally, self-authored or endorsed) and those who are merely externally controlled for an action typically reveal that the former, relative to the latter, have more interest, excitement, and confidence, which in turn is manifested both as enhanced performance, persistence, and creativity" (Deci and Ryan, 1985, p.69). Intrinsic motivation is seen as a vital element in the social and cognitive development of learners (p.70). It is also believed to be a greater driving force for students' engagement with tasks than extrinsic motivation.

According to SDT, intrinsic motivation can be achieved by satisfying three basic psychological needs, namely: autonomy, relatedness, and competence. It is proposed that autonomous learning helps boost intrinsic motivation by positively affecting learners' cognitive abilities, including critical thinking. Relatedness means that feeling connected to others and having a supportive learning environment boosts learners' intrinsic

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

motivation, exemplified by receiving constructive feedback from teachers and peers in a language classroom (Standage et al., 2005; Huang et al., 2023). Competence or self-efficacy, allied to mastery, refers to students' self-belief or self-perception of their capability to engage successfully in tasks. The theory argues that students' confidence in their ability to complete tasks successfully adds to their intrinsic motivation, which in tum improves their cognitive skills. According to Deci, the theory hinges on the type of motivation students have, as opposed to its level.

SDT highlights the role of autonomy in fostering deep cognitive processing and engagement, both of which are vital for developing critical thinking. According to the theory, autonomy and self-regulation improve intrinsic motivation and, therefore, learners' abilities to think critically.

In their sub theory of SDT, cognitive evaluation theory (CET), the social element is emphasised. The focus here is on providing learners with positive and constructive feedback (Deci & Ryan, 1985). This is seen as factor in the enhancement of intrinsic motivation. In other words, intrinsic motivation is heightened when learners receive positive and constructive feedback and are autonomous and in control of their learning. Similarly, Vygotsky's (1978) theory of social development states that peer and instructor feedback can positively influence students' critical thinking skills. This framework is further supported by studies such as that of Bandura (1997), which push forward the notion of self-efficacy. According to this theory, more confident students are more motivated to engage and complete tasks that require a level of critical thinking. Confidence here reflects learners' self-belief in their cognitive abilities; this aspect corresponds to the mastery element in Deci and Ryan's theory of self-determination. In their theory, mastery is a vital component to boost intrinsic motivation, and it is defined by the learners' belief in their abilities to finish tasks successfully.

The theories of Deci and Ryan (1985) and Bandura (1997) emphasize the importance of mastery and skillfulness which help enhance learners' self-belief in their abilities to successfully engage in and complete tasks. This leads to enhanced cognitive abilities and increased intrinsic motivation. The two theories emphasize the role of autonomy in fostering better engagement and higher cognitive levels. Moreover, both theories acknowledge the social element and the significance of creating supportive learning environments.

Although these theories do not mention critical thinking skills overtly, and do not link them directly to motivation and autonomy, they focus on improvement of cognitive skills. However, different cognitive skills (analysis, inference, and self-regulation) are central components in critical thinking (Facione, 1989).

The Evolution of Cognitive and Critical Thinking Frameworks in Education

Bloom's hierarchy of educational cognitive objectives (1956) is considered the cornerstone in understanding how to develop cognitive skills. Bloom's model includes six levels of cognition: knowledge, understanding, applying, **analyzing**, **synthesizing**, and **evaluating**. It sees critical thinking as higher cognitive skills that require students to explain, interpret, analyze, and evaluate. Later, Anderson and Krathwohl (2001) have revisited Bloom's taxonomy of educational objectives, concluding that the ability to *create* preceded by the ability to *evaluate* are the highest cognitive levels. In addition, Anderson and Krathwohl added another dimension of knowledge to Bloom's proposed dimensions which is **metacognition**. They define it as the thinking of one's thinking, and it is related to the ability to **ask questions**, **reflect**, **solve problems** and other tasks that are linked to critical thinking. These two theories have introduced a framework that helps teachers enhance students' critical thinking through active learning.

Their frameworks see critical thinking as the product of several cognitive processes, however, Facione (1990) provides an overt definition of critical thinking as a skill that requires learners to possess several cognitive and behavioral skills. Like the above-mentioned frameworks, it acknowledges that critical thinking is an overarching term that contains several cognitive and behavioral elements. Facione states that critical thinking skills include skills which are; *(1) interpretation, (2) analysis, (3) evaluation, (4) inference, (5) explanation and (6) self-regulation"* (1990,p.5). Not only does the theory clearly define critical thinking as a set of cognitive skills, but it also mentions an element of autonomous learning (self-regulation) as a constituent. Similarly, Ennis (2011) states that ideal critical thinkers have certain qualities, such as the ability to assess different arguments and views, seek credible sources of information, conclude and summarize, and reflect on feedback. Ennis' theorizes that critical thinking is inherently an autonomous skill, therefore, for students to develop their critical thinking they must first be autonomous.

The terms autonomy and critical thinking have been explored through the lens of the mentioned educational frameworks. However, these frameworks do not provide clear definitions of the elements that construct both concepts and how they affect each other. There is a clear mention of the fact that autonomy affects critical thinking and vice versa, the exact way is not addressed.

Autonomy and Critical Thinking in EFL

Holec (1981) makes the distinction between "self-directed language learning" and autonomy (cited in Palfreyman, 2020), meaning that self-directed learning does not necessarily equate with autonomous learning. Moreover, Holec (1981) provides a definition of autonomy as "one's ability to take charge of one's learning" (cited in Najeeb, 2013: 1239 and in Little, 1995:1). The definition has been expanded by Littlewood (1996) to include other behavioral aspects such as motivation to make choices and take responsibility for these choices, and adaptability to different contexts (cited in Vemury and Devlin, 2009). On the other hand, self-directed learning has been defined as the ability to set goals and to monitor success by deploying learning strategies that work for learners' individual needs (Ehrman & Oxford, 1990). It has also been defined as "persistence in learning, and resourcefulness" (Ponton, et al, 2000, cited in Macaskill et al., 2010:3).

Although both concepts (autonomy and self-directed learning) are often confused (Najeeb,2013; Macaskill & Taylor, 2010) and are used interchangeably (Long 1989), it can be said that self-directed learning is a process of autonomous learning.

Previous studies of critical thinking and autonomy provide valuable insights but also reveal gaps that require further research. Examples are Bloom's and Anderson & Krathwal's theories, which highlight the significance of analysis and evaluation as integral parts of critical thinking. However, they do not provide clear conclusions on how to nourish these skills through autonomous learning practice. In addition, Facione and Ennis' studies explain the qualities of a critical thinker but still lack an in-depth exploration of how autonomy affects the nourishment of these skills in specific educational contexts.

Furthermore, while SDT sheds light on intrinsic motivation and its positive influence on the enhancement of learning outcomes and cognitive skills, very few studies have directly linked autonomy with critical thinking in the context of English as a foreign language. The current study

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

measures the predictability of students' critical thinking skills by assessing the correlation between certain aspects of autonomy and their influence on critical thinking skills. This, as implied in the introduction, presents the research gap that can be filled with further research exploring the effects of different elements of autonomy on critical thinking. The present study can enhance our understanding of the relationship between the two concepts. In addition to aims focusing on a specific context (the Libyan context), providing a preview of the implications of theories in EFL contexts.

RQ.

What is the level of influence of each of the autonomous learning elements (goal setting, reflective learning, self-efficacy, and decision-making) on the development of critical thinking skills among Libyan university EFL students?

The hypotheses for this study

H.

Certain aspects of learner autonomy affect learners' critical thinking abilities more than others.

METHODOLOGY

Context of study

The study took place in the faculty of education at the University of Tripoli, Libya. The questionnaire was distributed online to students in student groups and through personal connections. All the participants are enrolled in the English language department, studying English subjects as core subjects. The sampled learners are 76 participants with different levels (levels here refer to their general grade or score and their academic semester).

This study aims to investigate the extent to which specific aspects of critical thinking skills contribute to overall critical thinking performance in English as a Foreign Language (EFL) learners. The methodology section outlines the processes involved in data collection, item selection, and data analysis.

Data Collection Tools

A structured Likert-scale questionnaire was used to collect data and was distributed online to the participants through google forms. The questionnaire included items representing critical thinking performance and items presenting autonomy learning. Each item was rated by participants on a Likert scale from 1 to 5. The ranges were as follows:

1. Strongly disagree,
2. Disagree,
3. Neutral,
4. Agree,
5. Strongly agree (Khaola & Ramokepa, 2015).

The data was collected anonymously and no personal information of sampled learners was shared, to ensure the anonymity and confidentiality of the responses.

Questionnaire Design

The questionnaire items were divided into themes, these being:

- Items representing critical thinking performance (dependent variable)
- Items representing aspects of learners' autonomy (independent variable)

The items were inferred based on relevant literature on autonomous learning (Huang & Benson, 2013; Littlewood ,1996; Bamberger& Schön, 1983; Anderson & Krathwohl ; Bloom, 1956; ; Nosratinia & Zaker, 2015; Zimmerman, 2002; Holec, 1981; Bandura,1997), in addition to studies on critical thinking (Halpern,1998; Facione, 1990; Ku, 2009; Nosratinia & Zaker, 2015; Garrison et al., 2009; Ennis,2011; Deci & Ryan, 1985; Little, 1995; Vygotsky,1978; Bendura, 1997). The items were run through two AI applications, namely Copilot and Chat GPT 4.0, to assist with the phrasing of the items and division of themes. To ensure the further content validity of the tool, colleagues within the English language department at the same faculty of education were consulted, and their feedback on the items was received and taken into consideration.

Questionnaire items according to themes

Themes in the questionnaire that represent the critical thinking performance

Table A

Theme	Analytical Skills	Engagement	Problem-Solving
Items	I can identify logical fallacies in arguments presented in English texts or discussions.	I regularly engage in discussions that challenge my perspectives and encourage critical thinking.	I approach problems in English with a critical mindset, considering multiple solutions.
	I often evaluate the reliability of sources when researching topics in English.	I can effectively summarize and critique arguments presented in English-language materials.	
	I analyze different viewpoints and arguments when engaging with English-language texts.		

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

Themes reflect the autonomy of learners.

Table B

Theme	Self-Efficacy	Goal setting	Reflective thinking	Decision making
Items	I am confident in my ability to think critically when studying English.	I feel responsible for learning English and taking the initiative to improve my skills.	I often reflect on my learning experiences in English and consider how to apply what I have learned.	I choose learning materials and activities that enhance my critical thinking skills.
	My critical thinking skills improve when I take charge of my learning.		I actively seek feedback on my critical thinking skills from my instructors or peers to improve my performance.	I feel comfortable making decisions about my learning strategies and approaches in English.
				My ability to think critically influences my choice of learning activities.

Data analysis

Data analysis was done in phases. First, data preparation in Excel was done, where the themes' items were averaged before using statistical analysis software programmes to measure the correlation among variables (the software used were SPSS, and datatab.net). ChatGPT and Copilot were consulted and utilized during the data analysis phases to provide interpretations, and both AI software programs were prompted to review the analysis, evaluate the process, and interpret tables. Another AI-powered application that was used in the process of writing this study is Grammarly for proofreading.

Data preparation

Before embarking on data analysis, the questionnaire items were first categorized into sub-themes, as shown in tables *A*, *B*, above and table *C* below summarizes the division of items.

Table C

Main themes	**Subthemes**			
Critical thinking (C.T)	Analytical Skills	Engagement	Problem-Solving	----------
Autonomy	Self-Efficacy	Goal setting	Reflective thinking	Decision making

The items representing each subtheme were averaged, and the independent variable (autonomy) was represented by four subthemes, as shown in Table C.

In the dependent variable (C.T) theme, the items were averaged into the three sub-themes. Then, the average score of the three sub-themes was calculated to create a unified score for all the theme items. The final score would represent each participant's critical thinking skills.

The data preparation process of categorizing items into sub-themes facilitates meaningful data analysis (DeVellis & Thorpe, 2021). Moreover, this helps the practicality of measuring complex variables by compacting them into manageable dimensions (Field, 2013). In addition, items and sub-themes were averaged to reduce data complexity further while maintaining core information and representing each sub-theme as a cohesive measure (Tabachnick &Fidell, 2019).

Participants

The total number of students participating was 76, of mixed genders majority females, and ages ranging from 18 to 24. The academic semesters were from the 1st to the 10th. The following tables show the distribution of genders among the sampled learners and their ages.

Demographic and academic information of the sample

Table 1

Gender:	Frequency	%	Valid %
Female	72	94.74%	96%
Male	3	3.95%	4%
Total	75	98.68%	100%
Invalid	1	1.32%	
Total	76	100%	

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

Table 1 depicts the distribution of gender among participants, the data demonstrates imbalance where most of the respondents are female learners 94.7%, while only 3.9% is male learners.

Table 2

Faculty	**Gender:**					
College of Education Tripoli	Female		Male		Total	
	n	%	n	%	N	%
	72	96%	3	4%	75	100%
Total	72	96%	3	4%	75	100%

The table (2) shows that the respondents are all registered students within the English language department at faculty of education Tripoli with valid answers were 100%.

Table 3

Average score:	Frequency	%
60-69	25	32.89%
70-79	21	27.63%
80-89	13	17.11%
90-100	9	11.84%
30-39	3	3.95%
50-59	3	3.95%
40-49	1	1.32%
Total	75	98.68%
Invalid	1	1.32%
Total	76	100%

The table above (3) shows the percentages of the academic levels of the respondents measured by their average score. The majority of learners are within the 60-69 % average score group. This percentage means that learners have an academic level that is adequate. In Libya 60-69% is considered acceptable, while 70-79% is considered good, 80-89% is very good, and above 89% is excellent/distinction. The majority of respondents are among the groups of 60% up to 79% (32% and 27.63% respectively). Following with 17.11% of respondents is the group with an average score of 80-89%, then the group of average score of 90-100% with 11.84% of the total respondents.

Table 4

Age:	Frequency	%	Valid %
18	18	23.68%	24%
21	17	22.37%	22.67%
20	13	17.11%	17.33%
19	10	13.16%	13.33%
22	6	7.89%	8%
23	6	7.89%	8%
24	3	3.95%	4%
17	2	2.63%	2.67%
Total	75	98.68%	100%

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

Age:	Frequency	%	Valid %
Invalid	1	1.32%	
Total	76	100%	

Table 4 shows the distribution of age among participants, ranging from 17 to 24. The largest age group was 18-year-olds, with 24% of the sample, followed by 21 with 22.67%, 20 with 17.33%, and 19 with 13.3%. Age groups of 22 and 23 were only 7.8% for each group. The lowest numbers were among the 17-year-old and 24-year-old age groups, with 4% and 2.6% of the total sample.

Table 5

Current semester:	Frequency	%	Valid %
1	22	28.95%	29.33%
5	13	17.11%	17.33%
6	13	17.11%	17.33%
3	8	10.53%	10.67%
8	6	7.89%	8%
7	4	5.26%	5.33%
9	4	5.26%	5.33%
4	3	3.95%	4%
10	2	2.63%	2.67%
Total	75	98.68%	100%
Invalid	1	1.32%	
Total	76	100%	

Table 5 shows the distribution of academic semesters of sampled learners; most of the sampled learners were enrolled in the first semester (28.95%), which explains the majority of learners being 18 years old. Semesters 5th and 6th each constituted 17% of the sample, followed by the third semester, with 10% of the sample.

Analysis of questionnaire variables

Reliability Statistics

Table 6

Cronbach's Alpha	Number of Items
0.92	17

Table 6 represents the Cronbach's Alpha score, which is used to assess the internal consistency of the items (the questionnaire items before they were themed and sub-themed). Cronbach's score ranges 0 to 1, the closer the score to 1 the higher the reliability of the scale or tool. It is read as follows; 0.7 is acceptable, 0.8 is considered good, 0.9 represents excellent reliability level (Tavakol & Dennick, 2011). The current study's score is 0.9, meaning that there is an excellent reliability level to the questionnaire.

To answer the research question, the researchers have conducted descriptive and regression analysis to measure the relationships among variables specifically , the dependent variable (critical thinking scores) and the four sub-themes of the independent variable (autonomy). The following section represents the analysis that was conducted using SPSS software.

Linear Regression

Assumptions

Linearity

In linear regression, when the data visualization shows a straight line through it, this means there's a linear relationship among the dependent variable and independent variables (Wolberg, 2010: 145). Figure 1 exemplifies the reading of data linearity (the graph was retrieved from datatab.net analysis software, the original source of the graphs is *Desmos graphing calculator (* https://www.desmos.com/calculator).

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

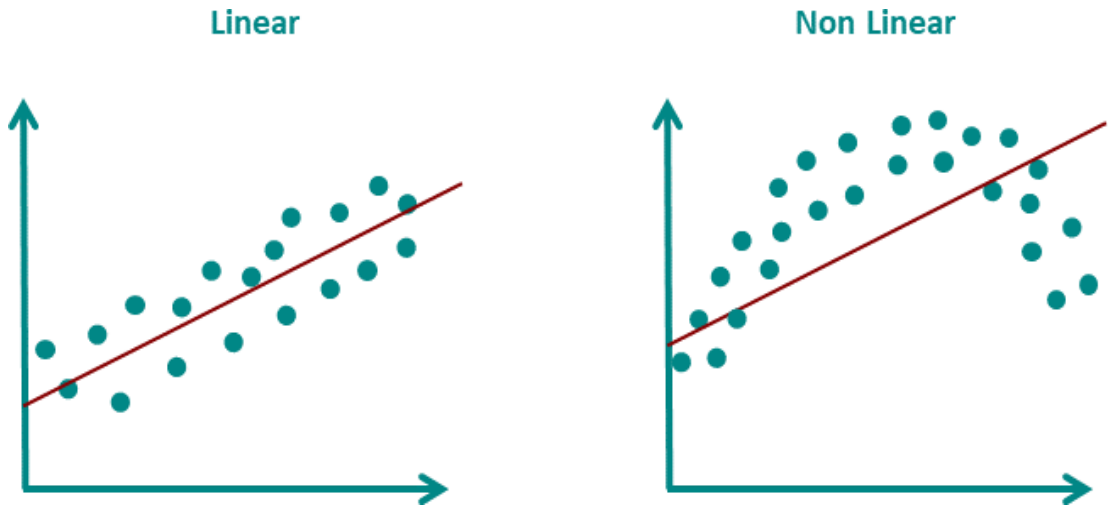


Figure 1:

The following graphs result from this study's model; the graphs were retrieved from *datatab.net* that was used to analyze and visualize this portion of the data:

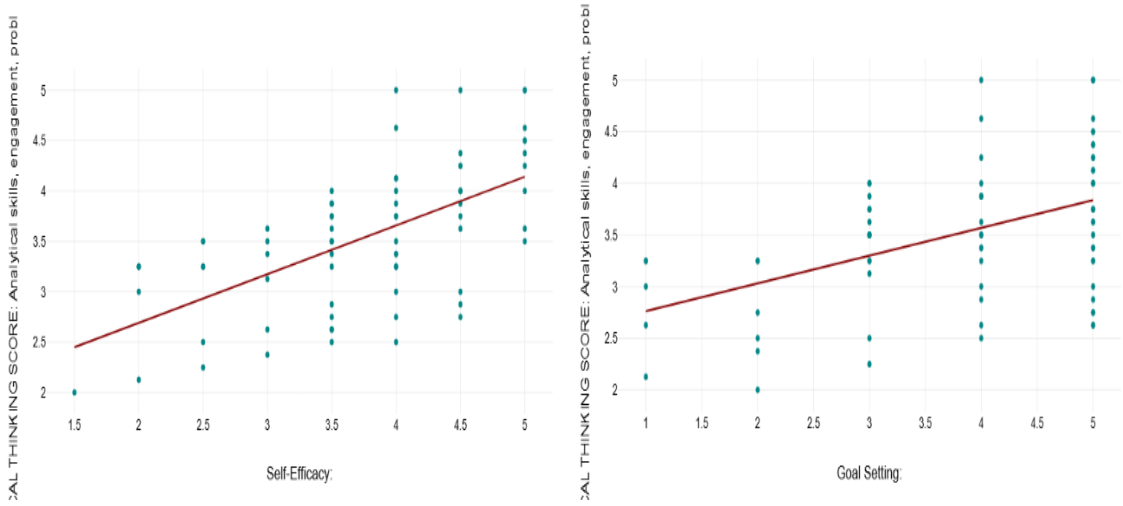


Figure 2: Critical thinking and self-efficacy and goal setting

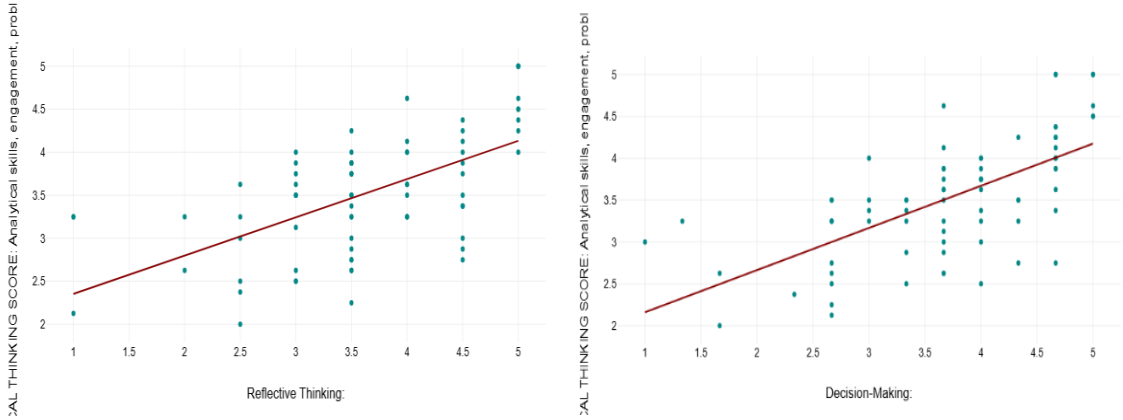


Figure3: critical thinking and reflective thinking and decision making

Linearity: The graphs and statistical analyses consistently show linear relationships between aspects of learner autonomy and critical thinking performance. The linear trend lines fit the data well, indicating that as learner autonomy increases, critical thinking performance improves in a linear manner.

Next, Pearson's coefficient was measured as shown in table 8. Pearson's Coefficient helps assess the strength and direction of the linear relationship among variables (Field, 2013), in the case of this study the variables are critical thinking as the dependent variable and autonomy dimensions as independent variables (the following tables *8,9,10,11* analysis was done using SPSS).

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

Correlations

Table 7

		CRITICAL THINKING SCORE: Analytical skills, engagement, problem solving	Self-Efficacy:	Goal Setting:	Reflective Thinking:	Decision-Making:
Pearson Correlation	CRITICAL THINKING SCORE: Analytical skills, engagement, problem solving	1.000	.606	.470	.604	.651
	Self-Efficacy:	.606	1.000	.697	.664	.825
	Goal Setting:	.470	.697	1.000	.694	.718
	Reflective Thinking:	.604	.664	.694	1.000	.623
	Decision-Making:	.651	.825	.718	.623	1.000
Sig. (1-tailed)	CRITICAL THINKING SCORE: Analytical skills, engagement, problem solving	.	<.001	<.001	<.001	<.001
	Self-Efficacy:	.000	.	.000	.000	.000
	Goal Setting:	.000	.000	.	.000	.000
	Reflective Thinking:	.000	.000	.000	.	.000
	Decision-Making:	.000	.000	.000	.000	.
N	CRITICAL THINKING SCORE: Analytical skills, engagement, problem solving	76	76	76	76	76
	Self-Efficacy:	76	76	76	76	76
	Goal Setting:	76	76	76	76	76
	Reflective Thinking:	76	76	76	76	76
	Decision-Making:	76	76	76	76	76

The analysis presented in the table ***8*** examines the correlation among the factors: (self-efficacy, goal setting, reflective thinking, and decision-making) and critical thinking skills (analytical skills, engagement, and problem-solving).

The interpretation of the table

1- Correlation Coefficients (r-values):

R values usually range from -1 to +1, the closer the reading was to -1 the weaker the relationship between measured variables. A positive R value indicates a positive correlation between the dependent and independent values, while a negative R value means that two variables share a negative relationship. This means that when a positive relationship exists one variable increases the other follows through and increases. Negative relationship means when one variable decreases the other increases and vice versa. However, r=0 when r value is zero it means there is no relationship between variables (Field, 2018; Cohen, 1988). According to Cohen (1988), r= .1 and r=.2 indicate small effect or a weak relationship, while r=.3 and r=.4 show a medium effect or a moderate relationship, r=.5 to r.7 show strong correlation or strong effect. Finally, r=.8 to +1 depict a very strong effect and an excellent level of correlation. For the current analysis (table 8) the correlation ranges from moderate to strong (Cohen, 1988, p.79:81).

Critical thinking and decision making: there is a robust effect of the two variables on each other and a strong positive correlation with r value of =.65. This supports the idea that the two skills are interlinked and strongly related (Facione, 2015).

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

For **critical thinking and self-efficacy**, the r value was r=.6, which indicates a moderately strong relationship between the two variables. This means that when self-efficacy increases the critical thinking skills of a learner improves. This agrees with Bendura's theory of self-efficacy (1997) that self-efficacy helps learners complete challenging tasks which in turn improves their cognitive abilities.

Similarly**, Critical thinking and reflective thinking**: the r value =.6 suggesting a moderately strong effect and very good positive level of correlation between the two elements. Here, the results support the statement that the practice of reflecting on past learning experiences helps learners with their evaluative skills which supports deep learning (Schön, 1983).

As for **critical thinking and goal setting**, the coefficient value was smaller with r=0.47. This means that although it is also a moderately positive relationship, these two variables have a weaker relationship. It is weaker than critical thinking relationship to self-efficacy.

The following shows AI (chat gpt 0.4) interpretations of p value and sample size:

1. **Statistical Significance (p-values):**

All correlations are statistically significant at p<.001p < .001p<.001 (Sig. 1-tailed). This implies that the observed relationships are unlikely to have occurred by chance. The significance underscores the reliability of these findings in the given sample.

2. **Sample Size (N):**

The sample size across all variables is consistent at N=76 , which is adequate for detecting meaningful correlations in educational research.

Key Insights and Implications

According to the analysis, critical thinking is mostly influenced by decision making skills (r=.65), reflective thinking (r=.6), and self-efficacy (r=.6). Then, with a strong but lesser degree of correlation critical thinking is linked to goal setting abilities (r=.4).

The correlation analysis provides evidence that the level of autonomy of learners, measured in terms of self-efficacy, goal setting, reflective thinking, and decision-making, has a significant influence on EFL learners' capacity for critical thinking.

Model Summary[b]

Table 8:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					PRESS	Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change		
1	.712[a]	.507	.479	.507137	.507	18.273	4	71	<.001	20.844	2.246
a. Predictors: (Constant), Decision-Making: , Reflective Thinking: , Goal Setting: , Self-Efficacy:											
b. Dependent Variable: CRITICAL THINKING SCORE: Analytical skills, engagement, problem solving											

The model summary (table 8) presents the regression analysis where the dependent variable is critical thinking, while the autonomous learning dimensions (decision-making, reflective thinking, goal-setting, self-efficacy) represent the predictors.

Model Fit (R and squared R)

R of coefficient .7 indicates a strong correlation between the dependent variable and the predictors. While R squared of 0.507 means that 50.7 % of critical thinking variance or differences in scores are explained adequately by the model (Tabachnick & Fidell, 2019; Cohen, 1988), however, this leaves 49.3% of unexplained variance. This leads us to think about other elements that may not have been included that affect critical thinking like context, prior learning experiences.

R squared adjusted

R squared adjusted measures the quantity of predictors in a sample and in a model. The value of R squared adjusted here is 0.47 which is lower than R and squared R, still it is a value that proves the robustness of the model (Field, 2018).

Standard Error of the Estimate (SEE)

The value calculated in the model for SEE is 0.507, meaning that the estimated values by the model (predicted scores) differ by 0.507 units from the actual values. A smaller value of SEE indicates the reliability of the predictions of the model zero, which indicates a statistical significance (Field, 2018; Newbold et al., 2013) a value of 0.5 can be considered adequate.

Change Statistics

R^2 Change = 0.507 means that all the dimensions of the independent variable (autonomy exemplified in the four themes presented before) explain 50.7% of the variance within the dependent variable score. As pointed before, this leaves 49% of unexplained variance., and this merits further investigation.

F Change = 18.273, Sig. F Change < 0.001, means that the value has a significant level (**p < 0.001**). This indicates that the predictors (themes of independent variable) collectively have a substantial impact on the dependent variable (critical thinking) (Field, 2018).

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

Durbin-Watson Statistic

The value of 2.2 (which is close to 2) indicates that the residuals (differences among observed and predicted values) are likely independent (no significant autocorrelation). This helps fulfill the assumption of uncorrelated residuals within the regression model (Durbin & Watson, 1951 cited in Maxwell & David,1995).

AI interpretation of results (chatgpt 4.0)

The predictors explain a substantial portion (50.7%) of the variance in critical thinking scores, suggesting that learner autonomy factors like self-efficacy and decision-making are strongly associated with critical thinking skills.

The statistical significance of the F-test ($p<.001$) confirms the predictors' collective impact on critical thinking. This regression model demonstrates that predictors such as self-efficacy, goal setting, reflective thinking, and decision-making significantly influence critical thinking in EFL learners. The unexplained variance of 49 % underscores the complexity of critical thinking and provides an opportunity for future studies to examine additional predictors and contextual variables.

Coefficients[a]

Table 10:

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.280	.274		4.675	<.001	.734	1.826		
	Self-Efficacy:	.084	.126	.105	.668	.506	-.167	.335	.278	3.593
	Goal Setting:	-.122	.077	-.214	-1.582	.118	-.277	.032	.378	2.644
	Reflective Thinking:	.283	.091	.385	3.116	.003	.102	.464	.455	2.197
	Decision-Making:	.370	.122	.478	3.035	.003	.127	.613	.279	3.578

a. Dependent Variable: CRITICAL THINKING SCORE: Analytical skills, engagement, problem solving

Table 10 examines the relationship between each independent variables and dependent variable.

Unstandardized Coefficients	
B	Std. Error
1.280	.274

Unstandardized coefficient B measures the predicted dependent variable score when all predictors are at zero (Field, 2018).

Sig.
<.001

Statistical significance is score <.001 which shows that the unstandardized coefficient value is statistically significant, and the model is reliably predicting the baseline value (Field, 2018).

95.0% Confidence Interval for B	
Lower Bound	Upper Bound
.734	1.826

Both the lower bond and upper bond are of values above zero, which provides a statistical proof the predictors share a positive correlational relationship with the dependent variable (Tabachnick & Fidell, 2019). This means if a predictor's score increases, the dependent variable score increases as a result, with 95% confidence that the values of the true effect of independent variable on the dependent variable will be between 0.734 and 1.826.

Predictor Self-efficacy

The B value (unstandardized coefficient) is 0.084, this number means that by the one-unit increase of the independent variable self-efficacy, the score of the dependent variable increases by 0.084 units. This number represents the effect of this independent variable while all other predictors are constant.

Standardized coefficient Beta for this predictor is 0.105, this shows that compared to the other predictors, self-efficacy has limited effect on the independent variable score. The P value is at 0.506, which is not statistically significant, in addition the confidence interval here is [−0.167,0.335]

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

which also does not depict a statistically significant value. **Collinearity (VIF (Various Inflation Factor) = 3.593):** the value of collinearity shows the degree of **multi-collinearity** (correlation among predictors) in the regression model. The score 3.5 shows that collinearity exists within accepted limits which is less than 10 in value (Ott & Longnecker,2016, p.650).

The conclusion is self-efficacy does not meaningfully predict the critical thinking score.

Goal Setting

The value of the unstandardized coefficient (B) is -0.122, this number represents the one-unit increase of the independent variable self-efficacy, the score of the dependent variable increases by -0.122 units. This number represents the effect of this particular independent variable while all other predictors are constant (at zero).

The value of standardized coefficient (BETA) is -0.214, this means that goal setting holds a small negative influence on the dependent variable, and the value p=0.118 means the score is not statistically significant (Martinez et al., 2013). Confirming the non-significance is the value of the interval confidence of [−0.277,0.032]. The value of Collinearity (VIF = 2.644) means there is limited but acceptable collinearity among the independent variables.

The conclusion is goal setting does not meaningfully predict the critical thinking score.

Reflective thinking

The unstandardized coefficient (B) value is 0.283, by every one-unit increase of the score of reflective thinking variable, the dependent variable increases by 0.283. the number represents the effect of this variable in isolation from other independent variables.

The standardized coefficient value (BETA) is 0.385 this number reflects a moderately positive effect on the dependent variable. The P value is p=0.003, indicating that the result is statistically significant. Moreover, significance of score is validated by the interval confidence value of [0.102,0.464]. The Collinearity score is VIF = 2.197, this reading means that there is low collinearity among predictors.

The conclusion of this segment of analysis shows that the relationship between the practice of reflective thinking and critical thinking skills is significant and positive. Therefore, reflective thinking can be a predictor of students' critical thinking skills.

Decision-making

B value is 0.370, while BETA value is 0.478, this indicates that decision making has a strong and a positive correlation with critical thinking.

The statistical significance of the scores: p=0.003, similar to reflective thinking score, this shows the statistical significance of the score. The confidence interval value is [0.127,0.613] which confirms the statistical significance. The Collinearity score is VIF = 3.578, this reading means that there is a moderate but acceptable level of collinearity among predictors.

The conclusion is that decision making has the strongest relationship with the dependent variable, and it is the most positive predictor among the 4 predictors in the model.

AI (Chat GPT 4.0) interpretation of the analysis:

Reflective Thinking and Decision-Making are significant predictors of Critical Thinking Scores ($p<0.01$). Both have positive effects, with Decision-Making showing the strongest influence.

Self-Efficacy and **Goal Setting** are not significant predictors ($p>0.05$) in this model.

To enhance critical thinking, interventions should prioritize fostering reflective thinking and decision-making skills.

Ai summary of the analysis

Descriptive analysis:

Participants reported moderate levels of critical thinking skills (M = 3.52, SD = 0.7) and autonomy dimensions (M = 3.64–3.86). Variability was observed in goal-setting abilities (SD = 1.23), suggesting that some students struggle with this aspect of autonomy.

Correlation analysis:

All autonomy sub-themes correlated positively with critical thinking (r = 0.47 to r = 0.65), with decision-making and reflective thinking showing the strongest relationships.

Regression Analysis:

The model explained 50.7% of the variance in critical thinking scores, highlighting the importance of autonomy while indicating room for further exploration.

The strongest predictor was found to be Decision-making (B = 0.370, p = 0.003) , followed by reflective thinking (B = 0.283, p = 0.003). Self-efficacy and goal setting were not statistically significant.

ANOVA:

The predictors collectively had a positive effect on critical thinking scores (F = 18.27, p < 0.001). However, the residual variance (49.2%) indicates other unexamined factors influence critical thinking.

DISCUSSION OF RESULTS

The results of the study suggest that there is a strong positive correlation between the autonomous learning variables (reflective thinking and decision-making skills) and critical thinking skills. Decision-making and thinking reflectively about learning experiences are vital parts of self-regulation in autonomous learning. This result aligns with Deci and Ryan's theory of self-determination, which also suggests that reflective thinking in this context enables learners to evaluate past learning experiences, which in part enhances their decision-making abilities for future learning endeavors. This also agrees with the theory of cognitive evaluation by Deci and Ryan (1985). In their theory, reflection positively influences learners' ability to make decisions about their learning, thus gaining a better sense of control over the processes of their learning. This positively influences their perceptions of their capabilities (confidence and mastery) which in turn enhances their cognitive ability (that is, in the context of this study, their ability to think critically). Moreover, decision making skills inform learners' learning goals and learning strategies.

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

Effective decision-making entails evaluating previous experiences and predicting outcomes for future experiences. As a result, these skills boost agency in the learning process and engage learners' higher level critical thinking skills (evaluation) (Bloom, 1956).

The other result of the study is that self-efficacy is shown to have a moderately strong correlation with critical thinking skills. This result supports Bandura's notion of self-efficacy's influence on the enhancement of cognitive abilities (1997). On the other hand, goal setting is seen, according to the analysis, to have the weakest correlation with critical thinking. This could suggest that although goal setting may enhance motivation, it is not necessarily directly linked to cognitive processes.

Answering the research question:

What is the influence of autonomous learning elements—goal setting, reflective learning, self-efficacy, and decision-making—on the development of critical thinking skills among Libyan university EFL students?

The study identifies which aspects of autonomy affect critical thinking positively. These are, in order of importance, from most significant to the least influential:

1. Reflective thinking
2. Decision making
3. Self-efficacy
4. Goal setting

According to the study's results, reflective thinking and decision making are the strongest predictors of critical thinking skills in the sampled learners. While self-efficacy has a moderately strong effect on the sampled learners' critical thinking skills, goal setting was found to have the weakest effect.

CONCLUSION

The autonomous learning dimensions that have substantial effect on critical thinking skills are decision making and reflective thinking. However, other variables in autonomous learning, namely, goal setting and self-efficacy affects critical thinking skills to a lesser degree. The results provide valuable insights identifying a clear relationship between specific elements of autonomy and critical thinking skills. In the context of this study, the results provide a framework for understanding the relationship between elements of learner autonomy and critical thinking skills. According to the results reflective thinking and decision making have a bigger influence on critical thinking skills than goal setting and self-efficacy. This highlights the need for teaching strategies that place focus on guiding learners to reflect on their learning experiences and seek feedback. In addition to helping learners make decisions regarding their learning strategies and choices of learning activities.

LIMITATIONS

The study's results cannot be generalized as the study had a sample imbalance with most females. Moreover, the unexplained variance percentage was 49%, which causes deeper exploration of other factors that could affect critical thinking such as; students' levels, cultural context, educational context, for instance. Moreover, a qualitative exploration can help deepen our understanding of the interplay between different elements and critical thinking.

REFERENCES

1) Alnofaie, H. A. (2013). *The implementation of critical thinking as EFL pedagogy: Challenges and opportunities* (Doctoral thesis). Newcastle University, School of Education, Communication, and Language Sciences.
2) Anderson, D. R., Williams, T. A., & Cochran, J. J. (2020). *Statistics for business & economics*. Cengage Learning.
3) Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives: complete edition*. Addison Wesley Longman, Inc.
4) Bamberger, J., & Schön, D. A. (1983). *Learning as reflective conversation with materials: Notes from work in progress*. *Art Education*, *36*(2), 68-73.
5) Bandura, A. (1997). *Self-efficacy: The exercise of control*. W.H. Freeman.
6) Benson, P. (2001). *Teaching and researching autonomy in language learning*. Longman.
7) Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. New York, NY: David McKay Company.
8) Chatterjee, S., & Hadi, A. S. (2012). *Regression Analysis by Example* (5th ed.). Wiley.
9) Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
10) Cotterall, S. (1995). Readiness for autonomy: Investigating learner beliefs. *System*, *23*(2), 195–205. https://doi.org/10.1016/0346-251X(95)00008-8
11) Dafei, D. (2007). An exploration of the relationship between learner autonomy and English proficiency. *Asian EFL Journal*, *24*(4), 24-34.
12) DATAtab. (n.d.). *DATAtab statistical software*. Used from 2024 to 2025. Retrieved January 8, 2025, from https://datatab.net
13) Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Springer Science & Business Media.
14) Desmos. (n.d.). *Desmos graphing calculator*. Retrieved January 8, 2025, from https://www.desmos.com/calculator
15) DeVellis, R. F. (2016). *Scale development: Theory and applications* (4th ed.). Sage Publications.
16) DeVellis, R. F., & Thorpe, C. T. (2021). *Scale development: Theory and applications*. Sage publications.
17) Durbin, J., & Watson, G. S. (1951). Testing for serial correlation in least squares regression. *Biometrika*, *38*(1-2), 159-178.
18) Egitim, S. (n.d.). *The Role of Learner Autonomy in the Expression of Critical Thinking Skills*.

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

19) Ehrman, M., & Oxford, R. (1990). Adult language learning styles and strategies in an intensive training setting. *The modern language journal*, *74*(3), 311-327.
20) Ennis, R. (2011). Critical thinking: Reflection and perspective Part II. *Inquiry: Critical thinking across the Disciplines*, *26*(2), 5-19.
21) Facione, P. A. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. *The Delphi Report*. Millbrae, CA: California Academic Press.
22) Field, A. (2013). *Discovering statistics using IBM SPSS Statistics* (4th ed.). Sage Publications.
23) Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Sage Publications.
24) Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, *15*(1), 7–23. https://doi.org/10.1080/08923640109527071
25) Halpern, D. F. (1998). Teaching critical thinking for transfer across domains: Dispositions, skills, and metacognitive monitoring. *American Psychologist*, *53*(4), 449–455. https://doi.org/10.1037/0003-066X.53.4.449
26) Haque, M. M., Jaashan, H. M., & Hasan, M. Z. (2023). Revisiting Saudi EFL learners' autonomy: a quantitative study. *Innovation in Language Learning and Teaching*, *17*(4), 845–858. https://doi.org/10.1080/17501229.2023.2166512
27) Holec, H. (1981). *Autonomy and foreign language learning*. Pergamon Press.
28) Huang, J. (Peter), & Benson, P. (2013). Autonomy, Agency and Identity in Foreign and Second Language Education. *Chinese Journal of Applied Linguistics*, *36*(1). https://doi.org/10.1515/cjal-2013-0002
29) Huang, Q., Muhamad, M. M., Che Nawi, N. R. binti, & Li, W. (2023). A Study on the Impact of Critical Thinking Skills and Foreign Language Enjoyment on Foreign Language Performance. *International Journal of Academic Research in Progressive Education and Development*, *12*(3). https://doi.org/10.6007/ijarped/v12-i3/18077
30) James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). *An Introduction to Statistical Learning: With Applications in R*. Springer.
31) Khaola, P. P., & Ramokepa, N. M. (2015). Determinants of attitudes, patronage intentions and the desire to spend time at a mall: The case of Pioneer Shopping Mall in Maseru, Lesotho. *KJBM*, 7(1), 18–30. https://www.researchgate.net/publication/290434000
32) Khaola, P., & Ramokepa, N. M. (2016). Determinants of Attitudes, Patronage Intentions and the Desire to Spend time at a Mall: The Case of Pioneer Shopping Mall in Maseru, Lesotho Determinants of Attitudes, Patronage Intentions and the Desire to Spend at a Mall: The Case of Pioneer Shopping Mall in Maseru, Lesotho (Vol. 7, Issue 1). *https://www.researchgate.net/publication/290434000*
33) Ku, K. Y. L. (2009). Assessing students' critical thinking performance: Urging for measurements using multi-response format. *Thinking Skills and Creativity*, *4*(1), 70–76. https://doi.org/10.1016/j.tsc.2009.02.001
34) Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). *Applied linear statistical models*. McGraw-hill.
35) Li, M., Zhang, Y., & Wang, Y. (2021). Investigating the impact of learner autonomy on critical thinking in EFL education. *Language Teaching Research*, 25(4), 567-586.
36) Liang, W., & Fung, D. (2021). Fostering critical thinking in English-as-a-second-language classrooms: Challenges and opportunities. *Thinking Skills and Creativity*, *39*, 100769. https://doi.org/10.1016/j.tsc.2020.100769
37) Littell, R. C. (1989). *Statistical analysis of experiments with repeated measurements*. HortScience, 24(1), 37-40.
38) Little, D. (1995). Learning as dialogue: The dependence of learner autonomy on teacher autonomy. *System*, *23*(2), 175–181. https://doi.org/10.1016/0346-251X(95)00006-4
39) Littlewood, W. (1996). Autonomy: An anatomy and a framework. *System*, 24(4), 427-435
40) Liu, Y., Arifani, Y., Hidayat, N., Wijayatiningsih, T. D., & Koiri, M. (2024). Learners' Readiness for Autonomy and Online Learning: EFL Teachers' Beliefs and Practices. *Ubiquitous Learning*, *17*(1), 183–203. https://doi.org/10.18848/1835-9795/CGP/v17i01/183-203
41) Long, H. B. (1989). Self-directed learning: Emerging theory and practice. In H. B. Long & Associates (Eds.), *Self-directed learning: Emerging theory and practice* (pp. 1–11). Oklahoma Research Center for Continuing Professional and Higher Education, University of Oklahoma.
42) Macaskill, A., & Taylor, E. (2010). The development of a brief measure of learner autonomy in university students. *Studies in Higher Education*, 35(3), 351–359.
43) Maxwell, L. K., & David, C. H. (1995). The application of the Durbin-Watson test to the dynamic regression model under normal and non-normal errors. *Econometric reviews*, *14*(4), 487-510.
44) Najeeb, N. (2013). Learner autonomy in language learning: A case study. *International Journal of Language and Linguistics*, 1(4), 1239-1246.
45) Newbold, P., Carlson, W. L., & Thorne, B. M. (2013). *Statistics for business and economics*. Pearson.
46) Nosratinia, M., & Zaker, A. (2013). Autonomous learning and critical thinking: Inspecting the association among EFL learners. *The First National Conference on Teaching English, Literature, and Translation (NCTLT)*, Shiraz University, Iran, August 2013. Retrieved from ResearchGate.
47) Nosratinia, M., & Zaker, A. (2013). Autonomous learning and critical thinking: Inspecting the association among EFL learners. In *First National Conference on Teaching English, Literature, and Translation, Shiraz University, Shiraz, Iran. Retrieved from http://www. civilica. com/Paper-TELT01-TELT01_226. html*.Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Newbury House.
48) Nosratinia, M., & Zaker, A. (2014). Metacognitive Attributes and Liberated Progress. *SAGE Open*, *4*(3), 215824401454717. https://doi.org/10.1177/2158244014547178
49) Nosratinia, M., & Zaker, A. (2015). Boosting autonomous foreign language learning: Scrutinizing the role of creativity, critical thinking, and vocabulary learning strategies. *International Journal of Applied Linguistics and English Literature*, *4*(4), 86–97.

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

https://doi.org/10.7575/aiac.ijalel.v.4n.4p.86

50) Oxford, R. L. (1990). Language learning strategies: What every teacher should know. *Newbury House*.
51) Palfreyman, D. (2020). *Autonomy in language learning: A critical discussion*. In D. Palfreyman & R. C. Smith (Eds.), *Learner autonomy across cultures: Language education perspectives* (pp. 1-20). New York, NY: Routledge.
52) Pang, Y. (2022). The role of web-based flipped learning in EFL learners' critical thinking and learner engagement. *Frontiers in Psychology, 13*. https://doi.org/10.3389/fpsyg.2022.1008257
53) Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.
54) Sobkowiak, P. (2016). Critical thinking in the intercultural context: Investigating EFL textbooks. *Studies in Second Language Learning and Teaching*, *6*(4), 697–716. https://doi.org/10.14746/ssllt.2016.6.4.7
55) Standage, M., Duda, J. L., & Ntoumanis, N. (2005). A motivational model of physical education. *Journal of Educational Psychology*, 97(3), 297-308.
56) Tabachnick, B. G., & Fidell, L. S. (2019). Using Multivariate Statistics (7th ed.). Pearson.
57) Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53-55.
58) Vemury, C. M., & Devlin, M. (2012). *Personalised approach to learner autonomy*. Retrieved from ResearchGate.
59) Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. *Cambridge, MA: Harvard University Press*.
60) Wolberg, W. H. (2010). *Data analysis using regression and multilevel/hierarchical models*. Sage Publications.
61) Yang D, Chen P, Wang H, Wang K and Huang R (2022) Teachers' autonomy support and student engagement: A systematic literature review of longitudinal studies. Front. Psychol. 13:925955. doi: 10.3389/fpsyg.2022.925955
62) Yang, Y., Zhang, L., & Liu, H. (2022). Learner autonomy and critical thinking in EFL: A meta-analysis. *Language Teaching Research*, 26(3), 345-367.
63) Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press.
64) Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice, 41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

License: This is an open access article under the CC BY 4.0 license: https://creativecommons.org/licenses/by/4.0/

Corresponding Author: Iman Albakkosh