



Developing critical thinking in EFL writing classroom: A Systematic Review of Pedagogical Strategies and Outcomes

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Abstract

This systematic review investigates the integration of critical thinking (CT) in the teaching of writing within the context of English as a Foreign Language (EFL). Recognizing the essential role of critical thinking in modern education, this review synthesizes findings from 35 empirical studies published between 2011 and 2025 using the PRISMA review guidelines, focusing on pedagogical strategies, assessment tools, and their impact on students' writing quality. The review identified a predominance of quantitative research in higher education, highlighting a gap in qualitative insights, particularly in secondary education. Key findings reveal that pedagogical approaches, such as infusion and mixed strategies, enhance students' critical thinking and writing skills. The review emphasizes the importance of targeted pedagogical methods, including teaching argumentation, problem-solving activities, and collaborative writing, while advocating for the further exploration of innovative instructional frameworks. This review aims to provide valuable insights for educators and researchers seeking to foster critical thinking in EFL writing instruction, thereby preparing students for academic and professional success.

1. Introduction

Critical thinking is an important skill in the 21st century (Trilling & Fadel, 2009). Therefore, educational institutions try to implement it in schools. “Without critical thinking guiding the process of learning, rote memorization becomes the primary resource, with students forgetting at about the same rate they are learning and rarely, if ever, internalizing powerful ideas” (Paul & Elder 2013, p. 10). It seems that critical thinking should be the main goal of education. “If students are to become educated persons, teachers must place thinking at the heart of the curriculum; they must require students to actively work ideas into their thinking using their thinking” (Paul & Elder, 2013, p. 11). In other words, the classroom should be a place for thinking and reflecting on the tasks being studied. In the last years, a lot of research has been done about critical thinking and its relation to writing instruction (Ahmed, 2014; Behrooznia et al., 2014.; Khalil & Hellalet, 2024; Lu & Xie, 2019; Marni et al., 2019; Mehta & Al-Mahrooqi, 2015; Mok, 2009; Moonma & Kaweera, 2022; Preiss et al., 2013a; Shaarawy, 2014; Stapa & Izzati Ibaharim, 2020; Yih Mah et al., 2021). Writing requires generating ideas, thinking about arguments, and structuring paragraphs or essays. All these procedures require critical thinking skills. This paper is a systematic review of the integration of critical thinking in the writing process. This research is of paramount importance because it will shed light on

the role and effectiveness of critical thinking in the teaching and assessment of writing. It will also examine pedagogical strategies and outcomes that might be applicable in the teaching of writing. This study was conducted to fill the gap in previous systematic reviews. Yuan, Liao, Wang, Kong and Zhang (2022) conducted a systematic review about the perceptions and engagement of EFL teachers with critical thinking in various educational contexts. They reviewed 25 articles from 2010 to 2020. However, the evaluation did not specifically address the field of EFL writing, although addressing several educational situations relevant to language acquisition. They neglected to consider the integration of CT instruction, which is a crucial component of a CT-integrated writing classroom. In addition, Yin, Saad, and Halim (2023) reviewed empirical studies on how to teach critical thinking (CT) in English as a foreign language (EFL) writing class from 2013 to 2022. Nevertheless, only 23 empirical papers were included in the systematic review, based solely on two databases, which might not provide a complete picture of all the research that has been conducted on CT in EFL writing. Moreover, although the evaluated research was conducted in a variety of countries, most of it concentrated on specific regions (e.g., Iran, Malaysia, China). This could restrict the generalizability of the results across educational settings and cultural contexts. Therefore, this study is essential to provide the current status of critical thinking in the teaching and assessment of writing in the EFL context. This paper examines the CT pedagogical strategies used in writing and their outcomes on EFL students over the last twenty years.

Influenced by Zou, Luo, Xie, and Hwang (2022) and Yin et al. (2023) on how to write systematic review questions, the present study will try to answer these questions:

1. What pedagogical strategies have been empirically validated for developing CT skills in writing EFL classroom?
2. What are the outcomes of developing CT strategies on the writing quality of students?
3. What instructional approaches to CT integration have been employed in EFL writing classrooms?
4. What CT assessment tools were used?

2. Literature Review

2.1. Critical thinking

Critical thinking is one of the concepts that is difficult to define. (Judge, Jones & McCreery, 2009; Ennis, 1985; Halpern, 2003; Ennis, 1996; Paul, 1982; McPeck, 1981; Martin, 1992; Moon, 2008). Moon (2008) in his book: *Critical thinking an exploration of theory and practice*, investigated tutors' views of critical thinking in the course of several workshops on critical thinking in higher education. He discovered that tutors have different definitions of the term critical thinking. Here are some examples: (Moon, 2008, p. 21)

(a) "Critical thinking is the ability to consider a range of information derived from many different sources, to process this information in a creative and logical manner, challenging it, analyzing it and arriving at considered conclusions which can be defended and justified. Its opposites are prejudice and the risk to judgement. Knowledge has to be constructed – and its meanings change with the context".

(b) "Critical thinking is to challenge a theory or an idea".

(c) "It is to develop your own argument, deconstructing ideas or synthesizing a range of ideas associated with complex ideas. There may be different routes to the same conclusion or different conclusions to the same issues".

(d) "It is a 3-D thinking process – depth, breadth and time; being objective and not subjective; not a personal evaluation but being flexible to apply others' thought or theory".

While there is no standard definition of critical thinking, various studies refer to definitions provided by scholars such as Paul & Elder (2013), Ennis (2015), Judge et al. (2009), and Facione (2011), Behrooznia et al. (2014); Hakim & Sari, 2022; Moonma & Kaweera, 2022; Shaarawy, 2014; Stapa & Izzati Ibaharim, 2020). For Judge et al. (2013), they defined critical

thinking as “essentially a questioning, challenging approach to knowledge and perceived wisdom. It involves examining ideas and information from an objective position and then questioning this information in the light of our own values, attitudes and personal philosophy” (p.1-2). In other words, Critical thinking (CT) involves examining information based on objectivity and values. Also, one of the known definitions in the literature is written by Paul and Elder (2013). For them, “critical thinking is the art of thinking about thinking while thinking to make thinking better. It involves three interwoven phases: It analyzes thinking, it evaluates thinking, and it improves thinking” (p.1). Therefore, every situation, challenge, or problem is an opportunity to test critical thinking and to make it function more effectively. Most importantly, “Critical thinking is thinking that has a purpose (proving a point, interpreting what something means, solving a problem), but critical thinking can be a collaborative, noncompetitive endeavor” (Facione, 2011, p.4). In other words, Critical thinking can be fostered in an environment where collaboration among learners is focused on a specific goal. Ennis (2015) stated that “Critical thinking is reasonable reflective thinking focused on deciding what to believe or do” (p. 32). Thus, the starting point of every action we take should be based on critical thinking rather than random thinking.

2.2. Writing

When it comes to learning languages, one should practice language skills, which refer to receptive skills (listening and reading) and productive skills (speaking and writing). Writing is a challenging task for EFL learners (Langan, 2010). Brown and Lee (2015) made a distinction between speaking and writing, arguing that writing involves a distinct skill set and differs significantly from speaking. They contend that the enduring nature and detached context of written communication, along with its specific rhetorical norms, establish writing as a separate entity from speaking, akin to the difference between swimming and walking. Also, they asserted that writing is difficult because “written products are often the result of thinking, drafting, and revising procedures that require specialized skills—skills that not every speaker develops naturally” (Brown & Lee, 2015, p. 427). The challenges of writing also lie in its measurement. “Whereas reading comprehension can be measured through multiple-choice items, the measurement of writing is more expensive and, at least apparently, less reliable” (Preiss et al., 2013 p.1).

Most importantly, Brown and Lee (2015) distinguished between two approaches to writing: product oriented and process oriented. For them, both approaches are important. They argued that:

The product is, after all, the ultimate goal; it is the reason that we go through the process of prewriting, drafting, revising, and editing. Without that final product firmly in view, we could quite simply drown ourselves in a sea of revisions. Process is not the end; it is the means to an end (p. 429).

Writing can be difficult, but teachers should help students improve this skill because it is important for both school and work. Competence in written expression is a prerequisite for course completion, as academic assignments span a variety of writing styles, ranging from short phrases and paragraphs to extensive reports and scholarly research papers (Brown & Lee, 2015). Competence in writing can be achieved through the implementation of communicative language teaching method. In CLT classroom, Teachers should encourage students to use their existing knowledge to understand texts, develop their own ideas, offer critical analyses, and find their unique voices; the teacher's role should be that of a facilitator and guide rather than an authoritative director (Brown & Lee, 2015).

Moreover, writing can be challenging for learners due to negative attitudes or past experiences. For example, Langan, a scholar and author of "Exploring Writing: Sentences and Paragraphs," initially struggled with writing but had a transformative experience in college. An instructor's consistent questioning of his arguments and evidence helped him understand the

importance of a clear thesis supported by evidence. Through practice, Langan's writing improved, his anxiety decreased, and he recognized that writing is a skill that can be developed through specific principles and techniques (Langan, 2010). He concluded that "writing is a skill. It is a skill like driving, typing, or cooking, and like any skill, it can be learned" (p.10). Most importantly, writing is not just one skill but various processes, skills and competencies that work together in order to reach a sound product. Effective writing skills are fundamentally connected to effective cognitive processes, as writing significantly contributes to the development of good thinking (Condon & Kelly-Riley, 2004).

2.3 Integrating critical thinking to writing

Integrating critical thinking into writing can be challenging, but students will benefit from this integration. As Arapoff (1967) pointed out, when writing, students should consider their purpose, choose relevant facts, and organize them coherently. Learning to write is largely learning to think clearly. Writing allows for even more detailed thought compared to the thinking involved in a conversation as Lipman et al. (1980) asserted, "if the thinking that goes on in a conversation is densely structured and textured, that which goes in the act of writing can be even more so" (p. 14). Therefore, for students acquiring English as a second or foreign language, integrating higher-order thinking with writing poses a significant cognitive and metacognitive challenge, as critical thinking during writing necessitates the management of two concurrent and interrelated thought processes. (Lin & Xiang, 2019). According to Schafersman (1991),

The best way to teach critical thinking is to require that students write. Writing forces students to organize their thoughts, contemplate their topic, evaluate their data in a logical fashion, and present their conclusions in a persuasive manner. Good writing is the epitome of good critical thinking (p. 7).

Practically speaking, Klimova (2013) suggested using argumentative writing to foster critical thinking skills of students. He argued that in argumentative writing, students are required to deliberately use and combine both lower- and higher-order thinking skills. Klimova outlined thinking processes that align with Bloom's Taxonomy as follows: (Klimova, 2013, p.10)

1. collecting information about the essay topic and reading the texts about the topic - knowledge (LOTS)
2. describing and explaining the background of the topic knowledge and comprehension (LOTS)
3. identifying and comparing arguments for and against comprehension and analysis (LOTS)
4. formulating, debating and verifying conclusions synthesis and evaluation (HOTS)

2.4. CT pedagogical strategies

When discussing the teaching of critical thinking, it is important to note the controversy surrounding the use of the general approach, infusion approach, immersion approach, or a mixed approach (Ennis, 1989). By "general approach," Ennis refers to a method that seeks to impart critical thinking skills independently from the delivery of existing subject information, with the objective of fostering critical thinking. For the infusion approach, critical thinking instruction is developed in the subject matter; students are encouraged to think critically about the material (Ennis, 1989). General concepts of critical thinking disposition and skills are clarified through in-depth, intentional, and well-structured and explicit education (Ennis, 1989). "Immersion is a similar thought-provoking kind of subject-matter instruction in which students do get deeply immersed in the subject, but in which general critical thinking principles are not made explicit" (Ennis, 1989, p.5). the last one is the mixed approach which includes the general approach with either the infusion or immersion approaches; the mixed approach comprises a distinct component focused on imparting fundamental principles of critical

thinking, while simultaneously engaging students in subject-specific critical thinking education (Ennis, 1989). As indicated by an empirical study on teaching thinking (Higgins, 2015), students taught through an explicit approach generally performed better than those taught using an implicit approach. Both teachers and students favor curricula that integrate teaching thinking with subject matter (cited in Lin & Xiang, 2019, p.97). Teaching both the content of a subject and critical thinking is challenging. That is why teachers focus on the content over other skills. As Schaferman (1991) argued: “we do an excellent job of transmitting the content of our respective academic disciplines, but we often fail to teach students how to think effectively about this subject matter” (p. 1).

Also, a major problem that hinders the integration of critical thinking in schools especially in higher education is the way of teaching. At university, usually professors use lecturing as a main strategy for instruction. For Schaferman, lectures are not an effective way to teach critical thinking. While listening to lectures is typically a passive activity for students, critical thinking is an active process. Analyzing, synthesizing, reflecting, and other critical thinking skills are intellectual abilities that must be practiced. Therefore, the focus of classroom instruction, assignments, term papers, and tests should be on the student's active intellectual participation (Schaferman, 1991). Most importantly, Schaferman asked a very important question which is why many students never develop critical thinking skills? In order to answer this question, he differentiated between two main goals of education the first one is “what to think” which he defined as transmitting and acquiring basic knowledge and the second is “how to think” or critical thinking. He asserted that “how to think” goal is neglected by instructors because they focus on “what to think” goal (Schaferman, 1991). Therefore, a shift toward the integration of critical thinking in the classroom is a step forward to reach the level where students know how to think.

Critical thinking is an important skill that should have a place in the educational system. “Using knowledge as it is being learned—applying skills like critical thinking, problem solving, and creativity to the content knowledge—increases motivation and improves learning outcomes” (Trilling & Fadel, 2009, p. 50). According to Rashtchi & Khoshnevisan (2020), there are many activities that can foster critical thinking in the classroom such as classroom activities, questioning techniques, cooperative learning, employing organizational skills, expanding vocabulary repertoire, and selecting topics for writing. Similarly, Trilling & Fadel (2009) suggested using a variety of inquiry and problem-solving activities to incorporate critical thinking into schools. These activities if taught systematically and regularly can make a huge change in education. “The logic for the instruction of CT is that a systematic way of intervention is mandatory to assist the individual learners to reach their potential zone of proximal development in their higher-order thinking ability” (Fahim & Eslamdoost, 2014, p, 147). In the EFL context, Zhao et al. (2016) pointed out that explicit instruction, teacher questioning, and active or cooperative learning strategies are useful strategies in integrating CT in EFL classrooms. In the same vein, the traits of successful CT instruction are further outlined by Mathews and Lowe (2011) and include introducing content-domain-related CT skills, giving students lots of practice opportunities, involving them in classroom decision-making, and fostering an emotionally safe learning environment.

Concerning the teaching of critical thinking in writing, Karanja & College (2020) argued that the syllabus for the writing course covers subjects that help students develop their critical thinking abilities; these include teaching students the distinction between opinions and arguments, identifying arguments in texts, and helping them to write arguments and counterarguments. Additionally, students are taught the value of substantiating their arguments and the various types of evidence that can be used to do so (Karanja & College (2020). With respect to the teaching of critical thinking in writing course, Karanja & College (2020) contended that: “effective teaching of writing skills at the college level must include the explicit and integrated teaching of core concepts and skills typically associated with critical thinking” (p. 236). With these efforts to integrate critical thinking in the teaching of writing, it is of

paramount importance to review the literature to shed light on this area and explore effective strategies and outcomes in the last twenty years.

3. Methodology

3.1. The review process: PRISMA

This study relies on the PRISMA 2020 statement: an updated guideline for reporting systematic reviews (Page, McKenzie, et al., 2021) and the PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews (Page, Moher, et al., 2021). The five steps to conduct a systematic review: 1) framing the question. 2) identifying relevant publications. 3) Assessing the study quality. 4) summarize the evidence. 5) Interpretation of the findings (Khan, Kunz, Kleijnen & Antes, 2003) were used followed by inclusion and exclusion strategies. Yin et al. (2023), Zou et al. (2020), and Yuan et al. (2022) also used similar strategies.

Concerning the collection of data, the Boolean expression was utilized as TS= ((“critical thinking” OR “higher order thinking skills”) AND (“writing”) AND (“English as a foreign language”) OR (“EFL”)) for gathering initial data.

With reference to the updated guideline for reporting systematic reviews (the PRISMA 2020 statement; Page et al., 2021), a flow diagram was created (Fig. 1). Concerning the databases used for primary research, the researcher relied on Web of Science (Wos), Scopus, JSTOR, ERIC, Science Direct, and Google Scholar to collect primary data on pedagogies strategies used to integrate critical thinking in EFL writing classrooms since we aim to reach a great deal of high-quality articles.

Research questions:

1. What pedagogical strategies have been empirically validated for developing CT skills in writing EFL classroom?
2. What are the outcomes of developing CT strategies on the writing quality of students?
3. What instructional approaches to CT integration have been employed in EFL writing classrooms?
4. What CT assessment tools were used?

Search query: (“critical thinking” OR “higher order thinking skills”) AND (“writing”) AND (“English as a foreign language”) OR “EFL”

Records identified through database searching: Web of Science, Scopus, Eric, Jstor, Google scholar
(n = 173)

First-round screening: records excluded on the basis of 1) non-empirical, 2) duplicates

After removing duplicates and non-empirical studies (n = 51)

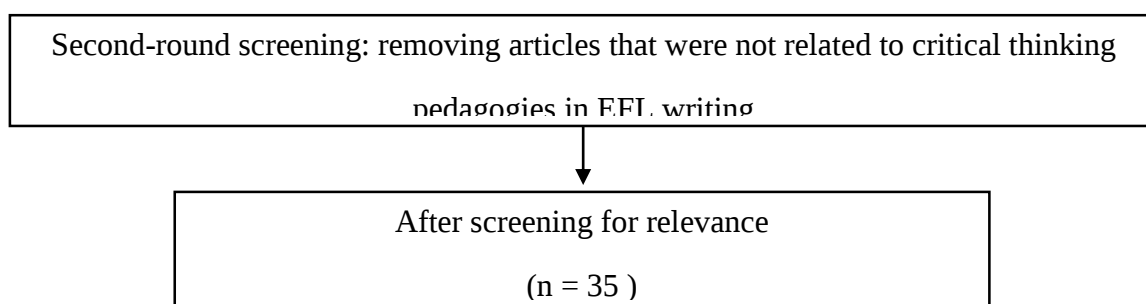


Fig. 1. Prisma flow diagram (adapted from Yin et al., 2023)

A total of 173 articles were collected for the initial search. Non-empirical studies and duplicates were eliminated in the first screening stage among the six primary databases. A second round of screening was then conducted for the remaining 122 studies to exclude irrelevant subjects (for example, studies applicable to other EFL domains, such as speaking or listening instead of writing, or those not focused on developing critical thinking in the EFL writing context). Thus, only 35 articles were selected from the pool for thorough review. Despite the relatively small sample size, the database resources are of good quality, and this review is limited to the development of critical thinking in the EFL writing context.

4. Results

4.1. Methodological information

Table 1. A methodological information of reviewed studies

Educational level	Research methods	Sampling techniques	Data collection	Data analysis
Higher education or university: 33 (94%)	Qualitative: 5 (14%)	Purposive 10 (29%)	Test 23 (38%)	Statistical analysis 27 (56%)
K-12 education or secondary school: 2 (6%)	Quantitative: 19 (54%)	Convenience 11 (31%)	Questionnaire 12 (20%)	Scoring rubrics 7 (15%)
	Mixed methods: 9 (26%)	Random 10 (29%)	Interview 9 (15%)	Content or thematic analysis 8 (17%)
	Action research: 2 (6%)	Comprehensive 1 (3%)	Observation 2 (3%)	Not mentioned 6 (12%)
		Not mentioned 3 (8%)	Writing Assignments 14 (23%)	
			Lesson plan 1 (1%)	

Table 1 shows the study's main methodological information, such as educational level, research methods, sampling techniques, data collection, and data analysis. Regarding educational level, 95% of the studies were conducted in a higher education context, while only 5% were related to secondary education. Similar results were found in Yin et al. (2023). Thus, the secondary education context could be a fertile area for exploring the integration of critical thinking in writing.

With regard to research methods, 54% of the reviewed studies were quantitative. Similarly, Yin et al. (2023b) found that 52% of the studies in their systematic review were quantitative. Additionally, 27% of the studies employed mixed methods, 14% were qualitative, and only 5% used action research. Therefore, more research should focus on qualitative methods and action

research, as these can provide insights into the practices and perspectives of teachers regarding the use of critical thinking in teaching writing.

The selected studies used convenience sampling (30%), purposive sampling (27%), and random sampling (27%). In terms of data collection, most studies used tests (38%), followed by writing assignments such as essay writing (23%). Interviews, observations, and lesson plans were also used to collect data. Regarding data analysis, most studies relied on statistical analysis tools such as SPSS (54%) followed by thematic or content analysis (16%) and scoring rubrics (14%).

4.2. Main results: type of instruction, pedagogical strategies, assessment tools, and outcomes

Table 2. type of instruction, pedagogical strategies, assessment tools, and outcomes

No.	Studies	Type of instruction	Pedagogical strategies	Assessment tools	Outcomes
1	Srinawati and Alwi (2020)	Infusion approach	Teaching the elements of arguments, constructing and evaluating a thesis, detecting fallacies, evaluating arguments, evaluating evidence.	Pre-test and post-test (experimental design)	Despite a short training period, students showed reassuring progress in their essays, though mastery was not achieved in using credible evidence, addressing alternative arguments, supporting conclusions, or maintaining logical flow. Continued integration of critical thinking over longer durations is expected to yield more encouraging results.
2	Mall-Amiri and Sheikhy (2014)	Infusion approach (Process-oriented writing)	the critical thinking techniques of debating, reasoning, problem solving, classifying, clarifying, and analyzing media were employed during the term.	Pre-test and post-test (experimental design)	critical thinking techniques were effective on the learners' writing achievement.
3	(Miri & Azizi, 2018)	Mixed approach (Infusion and immersion)	problem solving activities, raising questions, teaching logical reasoning, evaluating others' arguments regarding their writing. The principles of essay writing were taught and a topic was given to the participants for writing.	Pre-test and post-test (experimental design) Essay writing test/ TOEFL rating scales	The results of paired and independent sample t-tests showed that critical thinking techniques significantly enhanced EFL learners writing ability.
4	(Lu & Xie, 2019)	Mixed approach (infusion and immersion)	the collaborative explication of logical structure within passages, utilizing the Paul-Elder framework, which includes elements like main purpose and key questions. This process involves students jointly analyzing a passage, followed by individual	A critical thinking test and a writing test were used to investigate the effects of the treatment, and questionnaires and interviews were also employed to examine students'	students who received the instructional treatment outperformed the students in the control group in terms of overall critical thinking skills and skills of identifying and evaluating the elements of thoughts.

			writing assignments where they explicate and evaluate the logic in their peers' work.	attitudes toward the instructional pattern.	
5	Ebadi and Rahimi (2018)	Mixed approach (infusion and immersion)	instructional videos, authentic and collaborative learning activities, and authentic assessment and constructivist learning	The California Critical Thinking Skills Test (CCTST) form B developed by Facione/ IELTS academic writing tasks	The students in the WebQuest-based classroom outperformed the students in the face-to-face classroom quantitatively on critical thinking and academic writing skills
6	Marni et al. (2019)	No approach	Students selected one of three themes—illegal fishing, foreign workers, or curriculum change—to guide their reading and writing, aligning the activity with their interests and areas of specialization, as determined by a voting process.	Writing Argumentative essay	Students were oriented to analytic thinking, which was more likely to analyze the phenomena around them by exposing evidence and reason so that they can provide solutions according to the information and knowledge they get
7	Alkhouday (2015)	Mixed approach (infusion and immersion)	Critical thinking (CT) is taught through writing assignments focused on CT skills, including persuasive, argumentative, comparison/contrast, classification, cause/effect, researched, and reaction essays. The process involves group and peer work, with teachers providing guidelines and feedback.	The written assignments are kept in student's portfolios for assessment	incorporating critical thinking (CT) in writing instruction fosters student enthusiasm, positivity, and motivation. However, some teachers at BUC reportedly do not integrate CT into writing, treating the first draft as final. Consequently, students may lack analytical and intellectual skills due to their neglect in writing. Practicing CT signal words and focusing on revision techniques through self, peer, and group work are identified as necessary.
8	Susilo et al. (2021)	Mixed approach (infusion and immersion)	sequential procedures: 1 baseline writing task 2 collaborative text analysis 3 drafting with structured guidance 4 collaborative revisions 5 independent research and writing 6 timed argumentative essays	Argumentative essay rubric / Paul and Elder's critical thinking model	The CIRC technique fostered participants' critical thinking and self-voicing skills, evident in student-centered activities and writing outcomes. Participants engaged in productive writing processes, including critical reading, notetaking, summarizing, drafting, revising, and peer reviewing. The development of critical thinking and self-voicing simultaneously improved academic writing quality. Collaborative and process-oriented writing activities

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					were identified as crucial for enhancing these skills and positively impacting writing quality.
9	Murtadho (2021)	Infusion approach	Four stages of learning tasks: 1.problem understanding, 2.monitoring and assessment, 3.problem-solving practices, 4.evaluation, and conclusion drawing.	Essay writing	metacognitive and critical thinking process in the instructional treatments enabled the students to improve their argumentative writing skills
10	Pei et al. (2017)	No instruction	No CT teaching strategy	critical thinking skills (CTS) test and EFL argumentative writing test	textual analysis of typical essays showed that strong-CTS learners outperformed weak-CTS ones in relevance, clarity, logicity, profundity and flexibility of argumentative writing.
11	Hakim and Sari (2022)	Mixed approach (infusion and immersion)	Authentic Assessment, Constructivism, Inquiry, Questioning, Learning Community, Modelling, Reflection	Pre-test/post-test pattern	The findings revealed that the contextual teaching and learning approach was successful to enhance students' higher order thinking skill in writing ability
12	Mehta and Al-Mahrooqi (2015)	infusion (explicit instruction) and immersion (contextual application)	in-class social practices such as discussions and subsequent writing	Text evaluation/ Writing assignment	continuous practice, both oral and written, provide opportunities for students to develop their critical thinking abilities as they become more successful in incorporating nuanced and critical ideas into their academic writings
13	Sharadgah et al. (2019)	Infusion approach	In-class CTS training program/ essay writing practices	The Holistic Critical Thinking Scoring Rubric (HCTSR) Based on five criteria—content, format, organization, punctuation and mechanics, grammar, and sentence structure	Findings revealed that CT and essay-writing skills are significantly positively correlated. Assessment of students' essays denoted that the intervention group significantly surpassed the control in the five CTSs: "interpretation, analysis, evaluation, inference, and explanation"
14	Ahmed (2014)	structured infusion approach and scaffolded experiential model	focused Critical Thinking training	a progressive series of rubric assessments of students' writing	student composition improved in all of the five key areas, among all the groups. clarity of writing, analysis of author's argument, use of supporting information, organization, and grammar and syntax.

15	Nejmaoui (2018)	The infusion approach (explicit instruction)	the elements of arguments, constructing and evaluating a thesis, detecting fallacies, evaluating arguments, evaluating evidence	pre-test and posttest (The argumentative essay writing test)	The experimental group significantly outperformed the control group. Although posttest essay performance in areas like evidence use, addressing counterarguments, supporting conclusions, and maintaining logical flow did not reach mastery, the achieved average level is reassuring given the short training duration. Prolonged integration of critical thinking (CT) may yield encouraging outcomes.
16	Moonma and Kaweera (2022)	No approach	collaborative writing activity	Questionnaire based on Bloom (1956) and Anderson and Krathwohl (2001) Vygotsky (1987) framework/ interview	collaborative writing appeared to promote pupils to use critical thinking skills when writing. The practice of CT in CW was confirmed by the results of the observation part. They practiced higher-order thinking: analyzing, evaluating, and creating a written argument.
17	Nazari and Mahmoodi (2015)	Infusion approach	cooperative learning lesson plan	individual writing as the pretest and group writing as the posttest	Group writing instruction helped to improve writing quality.
18	Teng and Yue (2023)	Content-based instruction	This course focuses on developing students' critical reading and writing skills through summarizing, analyzing, evaluating, and synthesizing ideas. Students engage with scholarly sources, incorporate them into their writing, and learn about various writing genres, including the argumentative essay.	Metacognitive Academic Writing Strategies Questionnaire (MAWSQ)/ Critical thinking skills test based on Watson and Glaser (1980) (W GCTA)/Academic writing test	The results indicated significant relationships between students' metacognition, critical thinking skills, and academic writing
19	Wale and Bishaw (2020)	infusion with inquiry-based learning integration	inquiry-based argumentative essay writing instruction	Tests, focus group discussion, and student-reflective journal	Inquiry-based argumentative writing instruction is recommended for improving students' critical thinking skills, as it cultivates key components such as interpretation, analysis, evaluation, inference, explanation, and self-regulation.
20	Yanning (2017)	infusion approach	Integrating critical thinking in writing: 1 CT-oriented brainstorming	Writing tasks/ Essay writing	The infusion approach effectively enhanced students' critical thinking (CT) and L2 writing scores.

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			2 drafting 3 CT-oriented peer review 4 revision 5 infusion approach		A significant positive correlation ($r=0.893$, $p<0.01$) was observed between students' CT and L2 writing scores. Post-study interviews indicated that the infusion approach positively impacted students' learning of both CT and L2.
21	Shaarawy (2014)	Infusion approach	journal writing was an additional task to an academic writing course	Pre and post-tests	journal writing had contributed strongly to the development of the cognitive critical thinking skills of the experimental group
22	Moghaddam and Malekzadeh (2011)	Infusion approach	the learners were taught some underlying principles of CT. EFL learners were asked to write a composition about a unique topic they had never thought before.	Essay writing	explicitly teaching the principles of CT, learners' writings, in both groups, improved qualitatively and quantitatively; however, it had better effects on proficient learners.
23	Amrous and Nejmaoui (2016)	No approach	No CT instruction	The Ennis-Weir Critical Thinking Essay Test (Ennis & Weir, 1985) and an argumentative Essay	Moroccan university students demonstrate poor performance in critical thinking assessments, with their academic level being a significant factor in the development of this skill among EFL students. A notable discrepancy exists in the progress of argument construction, which is prioritized over argument evaluation.
24	(Fahim & Hashtroodi, 2012)	Infusion approach	ten phases of a task and critical thinking techniques, including using admit tickets for writing ideas, completing homework logs based on taught materials, listing and clustering concepts like the internet, and engaging in focused five-minute free-writes on subjects such as television.	Participants were asked to write two five-paragraph argumentative essays	Critical thinking techniques positively impacted students' development as critical thinkers, but did not significantly improve their ability to write argumentative essays.
25	(Khalil & Hellalet, 2024)	No approach	implementing writing tasks designed to foster autonomous writing and critical thinking (CT). These tasks are structured according to Bloom's Revised Taxonomy and encourage student submissions. Students engage in brainstorming before assignments and	Teacher feedback attitude Questionnaire/ semi-structured interviews	While teachers acknowledge the importance of cultivating critical thinking skills (CTS) in Moroccan EFL writing classes, the effective integration of CTS and future research necessitate addressing challenges related to student competency,

			are prompted for critical evaluation and self-correction through editing. A significant number of educators also utilize rubrics to enhance CT in writing exercises.		teacher resources, student engagement, classroom dynamics, and instructional materials.
26	Behrooznia et al. (2014)	No approach	No CT instruction	'Watson-Glaser Critical Thinking Appraisal' (2002) as well as an argumentative writing assignment was employed	There is a positive correlation between critical thinking ability and argumentative writing
27	Nikou et al. (2015)	No approach	No CT instruction	California Critical Thinking Test (form B)/ writing assignment	There is a positive relationship between critical thinking skills and writing quality. Furthermore, it was proved that evaluation has the strongest degree of relationship with the quality of writing.
28	Bashiri and Shahrokhi (2015)	process-based approach	students were taught to write using the process-based approach	Pre and post-tests	Process-based approach was of positive effect on learners' writing proficiency, critical thinking ability, and autonomy.
29	Harb et al. (2022)	No approach	No CT instruction	Peter Honey Critical Thinking questionnaire	EFL MA students are aware of the important role that critical thinking skills play in developing academic writing courses and in producing quality content texts.
30	Phyu (2023)	No approach	Sample texts, guided tasks, the process approach to teaching academic writing, technology use, written feedback, self-assessment, peer revision, and the Toulmin model.	Interviews	EFL tutors consider CT skills crucial for evaluating sources, analysing academic texts, questioning reliability, and expressing independent opinions
31	Golpour (2014)	No approach	No CT instruction	analytic scale of Weir (1990) for assessing participants' argumentative and descriptive writings	The high critical thinkers' writing was better in both modes of writing compared to the low critical thinkers.
32	Indah (2017)	No approach	No CT instruction	writing prompts and rubrics	Critical thinking skills are triggered by topic familiarity and can be mediated by writing performance.
33	Hellalet (2021)	No approach	No CT instruction	Opinion essays were analyzed	The participants exhibited a low level of

				using a revised version of Bloom's taxonomy of educational objectives.	critical thinking in their writing. They were unable to develop a stand and support it with arguments.
34	Oi (2018)	No CT approach	argumentative essay writing was taught over the course of one academic year.	questionnaire on students' beliefs toward writing in view of critical thinking/ students' written products/ students' reflections taken at the end of the academic year	Students' self-evaluation scores regarding their critical thinking skills improved following year-long instruction. Analysis of their written work, using Toulmin terms, indicated enhanced argument robustness, with progress documented through samples collected at four intervals. End-of-year reflections demonstrated students' comprehension of critical thinking concepts.
35	Trang and Anh (2020)	Infusion approach	the application of critical thinking tasks to writing paragraphs	pretest, posttest, the questionnaire and six treatment lesson plans to collect data	The result revealed that critical thinking tasks empowered EFL learners in their paragraph writing.

4.3. Type of instruction and assessment tools

Concerning the type of instruction, a significant number of studies, specifically 14 (40%), relied on the infusion approach. Adopting this strategy helps combine critical thinking with the subject's content. However, 13 (37%) studies did not name their pedagogical approach, and the researchers did not explain what they taught or what the intervention entailed. In addition, 6 (17%) studies used a mixed approach, incorporating both infusion and immersion. These studies combined the strengths of each approach to develop a skill-contextual learning environment. Finally, other studies (6%) relied on content-based instruction or a process-based approach to explore the role of writing in improving critical thinking skills of students.

Regarding assessment tools, 14 (40%) studies used essay writing as a tool to evaluate critical thinking and writing quality. Additionally, 10 (24%) studies relied on pre- and post-tests. Furthermore, 5 (13%) studies combined CMTs with writing tests. The remaining studies (12, or 29%) relied on other methods, such as questionnaires, interviews, student reflections, portfolios, and reflective journals.

4.4. Pedagogical strategies for enhancing critical thinking and writing skills

1. Teaching argument elements and writing assignments:

Teaching argument elements and CT-focused writing assignments are two of the most frequently utilized strategies, both accounting for 13% of the pedagogical approaches. Teaching argument elements emphasizes constructing and evaluating a thesis, detecting fallacies, and assessing arguments and evidence (Srinawati and Alwi, 2020; Nejmaoui, 2018; Miri and Azizi, 2018). Similarly, CT-focused writing assignments include persuasive, argumentative, comparison/contrast, classification, and cause/effect essays (Lu and Xie, 2019; Alkhoudary, 2015; Susilo et al., 2021).

2. Critical Thinking Techniques and Essay Writing Principles:

Critical thinking techniques and essay writing principles are also prominent representing 11% of the strategies. Critical thinking techniques such as debating, reasoning, problem-solving, classifying, clarifying, and analysing media (Mall-Amiri and Sheikhy, 2014; Murtadho, 2021; Teng and Yue, 2023). Essay writing principles, on the other hand, focus on

the collaborative explication of logical structure using frameworks such as the Paul-Elder model (Susilo et al., 2021; Ahmed, 2014; Yanning, 2017).

3. Problem-solving activities and authentic assessment:

Problem-solving activities and authentic assessment are equally significant, each comprising 8% of the strategies. Problem-solving activities encourage students to raise questions, engage in logical reasoning, and evaluate the arguments of others (Murtadho, 2021; Miri and Azizi, 20). On the other hand, authentic assessment integrates inquiry, questioning, learning communities, modelling, and reflection to create constructivist learning environments (Ebadi and Rahimi, 2018; Hakim and Sari, 2022).

4. Sequential Procedures and Process-Based Writing:

Sequential procedures, representing 8%, involve a structured process that includes baseline writing, collaborative text analysis, drafting, revisions, independent research, and timed argumentative essays (Susilo et al., 2021; Yanning, 2017). Similarly, process-based writing (6%) employs Bloom's Revised Taxonomy to guide students through brainstorming, critical evaluation, self-correction, and editing (Shaarawy, 2014; Khalil and Hellalet, 2024).

5. Inquiry-based learning and integration of technology:

Inquiry-based essay writing (6%) focuses on CT-oriented brainstorming, drafting, peer review, revision, and an infusion approach (Sharadgah et al., 2019; Wale and Bishaw, 2020). Additionally, technology and feedback (4%) leverage sample texts, guided tasks, the Toulmin model, self-assessment, and peer revision to enhance writing and critical thinking (Fahim and Hashtrودي, 2012; Phyu, 2023).

4.5. Outcomes

1. Short-Term Progress:

In some reviewed studies, despite limited training on critical thinking, students showed progress in writing essays (Srinawati and Alwi, 2020; Mehta and Al-Mahrooqi, 2015; Ebadi and Rahimi, 2018; Murtadho, 2021; Hakim and Sari, 2022; Ahmed, 2014; Moghaddam and Malekzadeh, 2011; Oi, 2018; Trang and Anh, 2020).

2. Effectiveness of CT Techniques:

A significant number of studies have shown that critical thinking techniques significantly enhanced writing achievement and critical thinking skills (Mall-Amiri and Sheikhy, 2014; Miri and Azizi, 2018; Lu and Xie, 2019; Murtadho, 2021; Hakim and Sari, 2022; Sharadgah et al., 2019; Ahmed, 2014; Yanning, 2017; Moghaddam and Malekzadeh, 2011; Fahim and Hashtrودي, 2012; Trang and Anh, 2020).

3. Instructional Impact:

In some studies, students receiving CT-based instruction outperformed control groups in terms of critical thinking and writing quality (Lu and Xie, 2019; Ebadi and Rahimi, 2018; Sharadgah et al., 2019; Nejmaoui, 2018).

4. Collaborative and Process-Based Approaches:

Collaborative writing and process-based methods have been shown to improve critical thinking and writing proficiency (Ebadi and Rahimi, 2018; Alkhoudary, 2015; Susilo et al., 2021; Hakim and Sari, 2022; Mehta and Al-Mahrooqi, 2015; Moonma and Kaweera, 2022; Nazari and Mahmoodi, 2015; Yanning, 2017; Bashiri and Shahrokhi, 2015).

5. Positive Correlations:

For the experimental design studies, strong correlations were observed between critical thinking skills and writing quality, particularly in evaluation and argumentative writing (Srinawati and Alwi, 2020; Mall-Amiri and Sheikhy, 2014; Sharadgah et al., 2019; Behrooznia et al., 2014; Nikou et al., 2015).

5. Discussion

5.1 Pedagogical Approaches and assessment tools

Identified pedagogical approaches, particularly the infusion approach (40%), highlight the importance of integrating critical thinking within specific disciplines, such as writing (Trilling & Fadel, 2009). However, the lack of a clearly defined approach in 37 of the studies raises questions about the coherence of pedagogical interventions. While the infusion of critical thinking into disciplinary co, such as writing, is promising, a lack of clarity in implementation could limit its effectiveness (Yin et al., 2023).

In addition, only 17% of studies utilized mixed approaches, specifically infusion and immersion. Therefore, to gain new insights and outcomes, future research could explore other approaches, such as general approaches. The critical thinking models used, which were present in 40% of the studies show varied adoption; however, the fact that 60% of studies do not utilize models may indicate a need for a stronger theoretical framework to guide pedagogical practices.

With regard to assessment, 34% of the studies opted for essay writing. This highlights the importance of this method not only for the assessment of argumentative abilities of students but also for measuring their capacity to articulate complex ideas. In parallel, 24% of the studies relied on pre- and post-tests, suggesting a desire to evaluate the evolution of students' skills over time. However, because the reviewed studies relied on short-term interventions, more longitudinal research is required in this field.

Additionally, 13% of the studies combined critical thinking tests with writing tests, indicating a trend toward integrated assessment that recognizes the interdependence of these skills. The remaining 29% of studies employed various methods, such as questionnaires, interviews, student reflections, portfolios, and reflective journals; demonstrating a holistic approach aimed at capturing a broader range of students' reflections and learning.

5.2. Pedagogical Strategies

5.2.1 Teaching argument elements and writing assignments

The ability to construct sound arguments is a significant advantage for students assisting them in both their academic and professional lives. According to Stab and Gurevych (2014), sound argumentation skills are crucial for evaluating various perspectives in decision-making. Most importantly, Bottomley et al. (2019) asserted that "your argument is how you say what you believe; the line of reasoning is what holds a critical essay together" (p, 9). Additionally, relying on writing assignments that focus on critical thinking can lead to positive outcomes. The National Commission on Writing (2003) pointed out that:

“Writing assignments (CT-focused), such as persuasive, argumentative, comparison/contrast, classification, cause/effect essays, are important tools to practice critical thinking.” Writing essays about controversial issues is an opportunity for students to analyse and evaluate ideas. The quality of writing must be improved if students are to succeed in college and in life” (p, 7).

5.2.2 Critical Thinking Techniques and Essay Writing Principles

Critical thinking such as debating, reasoning, problem-solving, classifying, clarifying, and analysing can be effectively used in the EFL classroom to enhance students' critical thinking skills. Research by Abrami et al. (2014) identified two key instructional interventions that promote the development of generic critical thinking (CT) skills: dialogue opportunities, such as teacher-led discussions, and exposure to authentic problems. Engaging in whole-class and group discussions improves CT outcomes, while applying problem-solving and role-playing techniques also significantly promotes critical thinking.

Therefore, diversifying activities in the EFL classroom is essential for building critical thinking and creating a positive learning environment. Additionally, teaching students the principles of essay writing using frameworks such as the Paul-Elder model can provide a precise structure for examining reasoning processes. Hinkel (2015) asserted that: “writing and

language instruction need to be integrated, based on a clear understanding of the writing needs of academic writers, and that principled and language-focused curricula are necessary to guide this endeavour” (p. 1). This means that teachers should be equipped with necessary techniques and competencies for teaching writing principles.

5.2.3 problem-solving activities and authentic assessment

Problem-solving activities encourage students to raise questions, engage in logical reasoning, and evaluate the arguments of others. Trilling and Fadel (2009) stated: “applying skills like critical thinking, problem solving, and creativity to the content knowledge increases motivation and improves learning outcomes” (p. 50). In the same context, Martinez (1998) pointed out that problem-solving is the process of advancing toward a goal while the path to that objective is uncertain. It combines a person's experiences with the demands of the task at hand.

With regard to authentic assessment, it integrates inquiry, questioning, learning communities, modelling, and reflection to create constructivist learning environments. According to social constructivism, social interactions facilitate the development of higher-order thinking, which primarily occurs in social situations like classrooms (Vygotsky, 1987). Research shows that authentic assessment influences students' learning outcomes (Dochy & McDowell, 1997; Wiggins, 1990) and fosters the growth of higher-order cognitive abilities (Ashford-Rowe, Herrington, & Brown, 2014). Additionally, it enhances self-regulation (Pintrich, 2000), commitment and motivation for learning (Nicol, Thompson, & Breslin, 2014), autonomy (Raymond et al., 2013), metacognition, and self-reflection (Vanaki & Memarian, 2009). Most importantly, a study conducted by Aziz and Yusoff (2016) demonstrated that evaluating young students' writing abilities through authentic assessment is advantageous and effective in helping them improve their writing in English language classes.

5.2.4 Sequential procedures and process-based writing

Sequential procedures include a structured process that includes baseline writing, collaborative text analysis, drafting, revisions, independent research, and timed argumentative essay. These techniques can create valuable learning opportunities for students when combined. Yin et al. (2023) conducted a systematic review and found that similar critical thinking (CT) integrated instructional practices in EFL writing were useful, including:

1. Presenting CT topics explicitly.
2. Establishing a social learning environment.
3. Providing suitable scaffolding materials.
4. Questioning strategies.
5. Receiving feedback from peers or teachers.
6. The use of internet technology.

Concerning process-based writing, teachers employ Bloom's Revised Taxonomy to guide students through brainstorming, critical evaluation, self-correction, and editing. The use of guides and models can simplify the teaching process for educators. In this context, Kaviani and Heidar (2020) asserted that a guided worksheet is a vital tool for improving critical thinking abilities at every stage of the writing process.

5.2.5 Inquiry-based learning and technology integration

Inquiry-based learning is an effective method for integrating critical thinking in the EFL classroom. This approach emphasizes the central role of students in the learning process. Inquiry-based training is essential for advancing critical thinking (Etemadzadeh et al., 2013; Huang, 2016). The critical thinking abilities of students are improved through inquiry-based argumentative writing education (Wale & Bishaw, 2020). Consequently, inquiry-based learning is recommended as a method for enhancing students' critical thinking skills, as it improves abilities such as interpretation, analysis, evaluation, inference, explanation, and self-regulation (Wale & Bishaw, 2020).

In addition, leveraging technology to improve writing and critical thinking teaching can lead to better outcomes. In this context, Trilling and Fadel (2009) pointed out that “communication and collaboration can be learned through a wide variety of methods, but they are best learned socially—by directly communicating and collaborating with others, either physically, face-to-face, or virtually, through technology” (p. Ine, in a study about technology integration in an Indonesian EFL writing classroom, Mali and Salsbury (2021) found that the most successful experiences with technology occurred in the planning stage, where students benefited from using the internet to gather ideas during the prewriting phase.

6. Conclusion

The results of the review indicate short-term progress in writing skills, even with limited training in critical thinking. This suggests that even modest interventions can have a positive impact on the health of the population. Such outcomes encourage teachers to integrate critical thinking into their classrooms. Without critical thinking to guide the learning process, rote memorization prevails, causing students to forget information at a rate comparable to their acquisition, seldom internalizing significant concepts (Paul & Elder, 2013).

Furthermore, studies that integrated critical thinking techniques showed significant improvements in both writing and critical thinking skills. Specifically, the more critical thinking techniques are employed by teachers, the more students improve in these areas. Proficient writers are inextricably linked to proficient cognitive processes because writing greatly fosters the development of sound thinking (Condon & Kelly-Riley, 2004).

A considerable number of reviewed studies have demonstrated the role of critical thinking instruction in writing, highlighting the importance of targeted instruction. For students to become informed individuals, educators must prioritize critical thinking within the curriculum, compelling students to actively engage with ideas through their cognitive processes (Paul & Elder, 2013).

Most importantly, proficiency in written communication is essential for course completion, as academic tasks encompass diverse writing formats, including brief phrases, paragraphs, comprehensive reports, and scholarly research papers (Brown & Lee, 2015). The studies also highlighted that implementing collaborative and process-based pedagogical methods can lead to positive outcomes in students’ writing and critical thinking.

Concerning the review’s limitations, this study primarily relied on English-language literature, which may limit its comprehensiveness. Exploring studies published in other languages could provide additional insights into this topic. Furthermore, potential gaps in database coverage may restrict the scope of this research. Most importantly, the quality of the studies assessed may vary, potentially impacting the overall findings.

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