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Research Article

Enhancing Reflective Teaching Among EFL Teachers Through the Integration of Critical Appraisal in Teacher Training Programs

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ABSTRACT

In the realm of English Language Teaching (ELT), a hands-off approach is increasingly being rejected by professionals in Teaching English as a Foreign Language (TEFL). Based on this foundation, the current research aimed to examine the effect of Critical Appraisal of Published Research (CAPR) within undergraduate teacher education programs on Reflective Teaching (RT) among English as a Foreign Language (EFL) instructors. Pursuing this goal, a cohort of 30 EFL teachers, both male and female, were selectively chosen and divided into two groups at random. During two research methodology courses, the experimental group engaged with CAPR, while the control group partook in conventional, teacher-led lessons with summative assessment. The RT questionnaire was utilized for both the initial and final assessments. Post ensuring the initial uniformity of the participants' RT levels, the analysis of the data collected post-intervention via an independent-samples *t*-test revealed a notable disparity (t (21) = 2.575, p = .018, two-tailed, eta squared = .2399, denoting a substantial effect size) in the post-treatment RT scores of the experimental group compared to the control group. Put simply, the findings indicated that CAPR had a markedly positive influence on the RT of EFL teachers.

Keywords: *Critical appraisal, Reflective teaching, Research courses, Teacher training*

1. INTRODUCTION

Contemporary movements in TEFL, particularly those aligned with the Post method approach, are predicated on the idea that EFL educators serve as agents of transformation and reflective practitioners (Elgueta, 2023; Kumaravadivelu, 2012). Embracing the identity of reflective practitioners and the intellectual capacity for reflective thought on teaching practices is now deemed a fundamental requirement for language educators (Nosratinia & Zaker, 2017). This necessitates a critical and systematic examination of teaching and learning perspectives and methodologies, enabling teachers to operate in a more logical and accountable manner (Farrell, 2012; Lightbown & Spada, 2013). Braun and Crumpler (2004) have highlighted that without such reflective engagement, educators are unable to infuse creativity into their teaching methods, leading to the perpetuation of "ineffective teaching strategies" (p. 61). This emerging viewpoint challenges the traditional notion that the role of EFL teachers is merely to convey information from the curriculum to students in a somewhat passive manner (Bell, 2003; Kumaravadivelu, 2001). In this context, Lange (1990) has observed:

> The reflective process allows developing teachers' latitude to experiment within a framework of growing knowledge and experience. It gives them the opportunity to examine their relations with students, their values, their abilities, and their successes and failures in a realistic context. It begins the developing teacher's path toward becoming an expert teacher. (pp. 249-250)

Reflective teaching, grounded in the reflective paradigm, enables a shift from theoretical frameworks to practical application. This shift is essential because, as Johnson (1996) notes, the disconnect between theory and practice is not typically due to teachers' ignorance of theory but rather to the unique challenges encountered in the practical setting. Additionally, the field of English Language Teaching (ELT) is currently experiencing the introduction of numerous innovative concerns and methods (Lightbown & Spada, 2013; Zaker, 2024). Consequently, Reflective Teaching (RT) is emerging as a key resource for those pursuing Teaching English as a Foreign Language (TEFL) and professionals engaged in language instruction.

Hence, it is a well-founded assertion that enhancing TEFL practices must involve recognizing the significant role of EFL teachers' reflective practices. These practices profoundly impact their classroom performance (Garton, 2008). The ability to critically and reflectively analyze one's teaching, which evolves through training, experience, and introspection, can greatly shape EFL teachers' views on instructional techniques and methods (Borg, 2008; Freeman, 2002). Moreover, engaging in this reflective journey enables ELT professionals to transcend the boundaries of personal biases and uncover insights that might otherwise remain unseen (Jay & Johnson, 2002).

In light of the unique aspects and opportunities presented by ELT teacher training programs, particularly in Research Methodology courses, this investigation aimed to explore how the application of Critical Appraisal of Published Research (CAPR) influences EFL teachers' RT. Critical Appraisal is characterized as "a systematic process used to identify the strengths and weaknesses of a research article in order to assess the usefulness and validity of research findings" (Young & Solomon, 2009, p. 82). During this critical evaluation, it is crucial to examine the research design's fit, critique the methodological aspects, and judge the suitability of the statistical techniques and their interpretations (Young & Solomon, 2009). Furthermore, Young and Solomon (2009, p. 83) highlighted several pertinent inquiries that ought to be considered when reviewing a quantitative research study. These inquiries include:

- Is the study question relevant?
- Does the study add anything new?

- What type of research question is being asked?
- Was the study design appropriate for the research question?
- Did the study methods address the most important potential sources of bias?
- Was the study performed according to the original protocol?
- Does the study test a stated hypothesis?
- Were the statistical analyses performed correctly?
- Do the data justify the conclusions?
- Are there any conflicts of interest?

Executing the multifaceted CAPR is susceptible to personal bias and subjectivity if not guided by a specific framework or set of criteria. Indeed, "a structured approach to critical appraisal could potentially improve the quality of this process" (Young & Solomon, 2009, p. 83). Among the various tools and protocols available for conducting CAPR, the framework offered by Best and Kahn (2006) is noted for its practicality and succinctness in steering the CAPR process. The details of this CAPR framework are outlined in Table 1.

Table 1

Guideline for Implementing the Critical Appraisal of Published Research

Element of Articles	Expected Features of the Element
Title	▪ clear and concise
Problem and Hypotheses	▪ clearly stated ▪ significance of problem ▪ specific question raised ▪ clear statement of hypothesis or ▪ research question ▪ testable hypothesis ▪ assumptions stated ▪ important terms defined
Review of Literature	▪ adequate coverage ▪ well organized ▪ important findings noted ▪ studies critically examined ▪ related to problem and hypothesis
Procedures	▪ subjects and methodology described in detail ▪ adequate sample ▪ appropriate design ▪ variables controlled ▪ appropriate data gathering instruments

Data Analysis/Results	▪ effective use of tables ▪ effective use of figures ▪ concise but complete report of findings ▪ appropriate statistical or other treatment of data ▪ logical analysis
Discussion/Conclusions	▪ problem restated or addressed ▪ hypotheses restated or addressed ▪ clear and concise ▪ conclusions based on results ▪ statement of practical or theoretical implications ▪ appropriate generalizations
Overall Form and Style of Paper	▪ clear and concise ▪ appropriate degree of objectivity ▪ all parts of the paper are properly related to each other ▪ Referencing according to appropriate style

Note. Adapted from *Research in Education* (p. 490), by J. W. Best and J. V. Kahn, 2006, Boston: Pearson. Copyright 2006 by Pearson Education Inc.

In order to meet the objective of this study, the following research question was formulated:

RQ: Is there any statistically significant difference between the impact of the critical appraisal of published research and traditional teacher-centered instruction on EFL teachers' reflective teaching?

Based on the abovementioned research question, the following null hypothesis was formulated:

H_0: There is not any statistically significant difference between the impact of the critical appraisal of published research and traditional teacher-centered instruction on EFL teachers' reflective teaching,

2. METHOD

2.1. Participants

This investigation initially identified participants from a group of 52 senior ELT undergraduates at Islamic Azad University, South Tehran Branch, selecting those with ELT experience. The cohort of EFL instructors (n = 30; comprising 21 or 70% females and 9 or 30% males) fell within an age bracket of 21 to 33 years (M_{age} = 25), with teaching tenures spanning from half a year to seven years ($M_{experience}$ = 17 months). The remaining undergraduates (n = 22), though part of the classes and subject to the interventions, did not contribute data for the research query. Participant selection employed convenience and purposive sampling methods, choosing from available intact groups (n = 52), focusing on EFL educators (n = 30). These groups were then evenly distributed into experimental and control units. Adhering to ethical research standards, participants were allowed to exit the study freely at any time(Ary et al., 2019), which resulted in a reduced participant count of 23 (17 or 74% females; 6 or 26% males) during the post-intervention stage.

2.2. Instrumentation

To achieve the goals of this research, the RT scale was utilized in conjunction with relevant instructional materials. The forthcoming sections will elaborate on the specifics and attributes of these tools.

2.2.1. The Questionnaire of Reflective Teaching

In this investigation, the RT assessment tool utilized was a 29-item Likert-scale questionnaire formulated by Akbari et al. (2010). Participants appraised the occurrence of each statement using a 5-tiered Likert scale, with options spanning from *strongly disagree* (1 point) to *strongly agree* (5 points). The questionnaire's items are distributed across five domains: Practical, Cognitive, Learner, Meta-Cognitive, and Critical. The instrument was validated by Akbari et al. (2010) on a cohort of 300 educators through both exploratory and confirmatory factor analyses, which refined the original 42 items down to 29. The questionnaire's reliability, as measured by Cronbach's alpha, was initially recorded at 0.91, while in the current study, it was calculated to be 0.92.

2.2.2. The Instructional Material

During the instructional period, both groups utilized "Research Methods in Applied Linguistics 1 & 2" by Farhady (2009), a comprehensive text on quantitative research methodologies, published by Payame Noor University. The curriculum specifically incorporated chapters 1, 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, and 15. Additionally, "Research in Education" by Best and Kahn (2006), a Pearson publication, served as a supplementary reference. Furthermore, the "Publication Manual of the American Psychological Association" (6th edition), commonly referred to as the APA Manual, by the American Psychological Association (2010), was employed as an ancillary resource alongside the primary textbook. Notably, the first chapter of the APA Manual, which addresses various research types, ethical considerations, and citation practices, was designated as a key resource for the research courses taught.

2.3. Procedure

To initiate this research and achieve its specific aims, several preparatory measures were undertaken, as outlined herein. Initially, authorization was secured from the authorities at Islamic Azad University, South Tehran Branch, to proceed with the investigation. The commencement of the study involved acquainting the participants—enrolled Research course students selected via convenience sampling—with the researcher, the objectives of the study, and its fundamental attributes. It was emphasized to the participants that their involvement was entirely voluntary, with the assurance that they could opt out at any moment, for any reason, without consequences. Additionally, it was guaranteed that their contributions would be handled with confidentiality. Subsequently, the participants, forming two complete groups, were randomly distributed into experimental (n = 15) and control (n = 15) categories.

Before the instructional sessions began and the interventions were applied, the RT scale was distributed to both participant groups. A detailed briefing on the instrument and how to respond was given to ensure clarity. Participants were reassured that their responses would not influence their course evaluations or treatment. They had 10 minutes to complete the scale, with researchers available to address any issues. These initial scores served as a baseline for comparing participant groups before the intervention (refer to Results for analysis). Over 15 weeks, participants underwent 15 sessions, each lasting 90 minutes, where they received uniform instruction in Research Methodology using the same materials. In the final session, the RT scale was readministered to gauge post-intervention effects, following the same protocol as the initial administration. Notably, the last 20 minutes of the classes diverged based on the distinct interventions each

group received, which represented the study's independent variable. The specific instructional approaches for each group will be detailed subsequently.

2.3.1. The Experimental Group

In the experimental group, the researcher's primary aim was to actively involve the participants in the CAPR, thereby allowing them to apply the newly acquired classroom knowledge. Following the pretest, the researcher dedicated 45 minutes of the initial session to the course's textbook (totaling 70 minutes with the pretest). Subsequently, in the last 20 minutes, the concept, definition, and objectives of CAPR were introduced. The participants were then provided with Best and Kahn's (2006) guidelines for CAPR execution (referenced in Table 1). Additionally, each participant received two types of quantitative research articles—one descriptive/correlational and the other experimental—to be used in conjunction with the CAPR guidelines, which they were instructed to bring to every session for practical application.

In the experimental group, the sequence of instructional topics was aligned with the CAPR guideline by Best and Kahn (2006), mirroring the control group's approach. After each session, a 5-minute intermission preceded a 20-minute CAPR-focused segment. During these segments, participants were tasked with classifying the day's topic under one of the seven principal domains outlined in the CAPR guideline. They then located the corresponding sections within two provided research articles. Subsequent to this, a critical assessment of each article was conducted, pinpointing the strengths and weaknesses relative to the session's topic. This analysis culminated in a 0 to 20 rating for each article, based on the session's focal point. For their term project, participants were required to compile two evaluative reports on new research articles—one descriptive, one experimental—detailing the strengths and weaknesses across the seven categories specified in the CAPR guideline, thereby applying their critical appraisal skills in a comprehensive manner.

2.3.2. The Control Group

As outlined in the initial segments of the Procedure section, both groups followed the same instructional process, utilized identical educational materials, and adhered to the same duration for each class session. The distinction between the groups emerged in the final 20 minutes of each session. In the control group, subsequent to the pretest administration using the RT scale, the first session resumed with a focus on the course textbook for 45 minutes. After this, a five-minute interlude was observed, succeeded by a recapitulation of the session's key points. The instructor then posed several questions related to these points, offering students the opportunity to respond voluntarily. It was previously noted that the instructional topics' sequence was consistent with the CAPR guideline by Best and Kahn (2006) for both groups. However, unlike the experimental group, the control group did not receive the CAPR guideline, as the deliberate omission of CAPR constituted the specific intervention for this cohort.

In a manner akin to the conclusion of the inaugural session, the concluding segment of each subsequent session—spanning the final 20 minutes—was allocated for the participants to address inquiries posed by the instructor and to recapitulate the session's content. For their term project, the EFL educators in the control group were tasked with identifying a research subject and formulating a corresponding research proposal, thereby applying their understanding of the course material in a practical and scholarly manner.

3. RESULTS

In this quasi-experimental, quantitative research featuring a pretest-posttest control group design, RT was the dependent variable, while the type of treatment—either the inclusion or exclusion of CAPR—served as the independent variable with two distinct levels. Essentially, the study aimed to evaluate the effects of these treatments on the participants' RT. Additionally, the intervening variables in the study were the participants' age and gender. To address the research question, the researchers carried out a range of relevant calculations and statistical analyses, the outcomes of which are detailed in this section.

3.1. Pre-Treatment Homogeneity of the Participants

To confirm the uniformity of participant reaction times prior to treatment, examining the pretest scores with appropriate statistical methods was crucial. Consequently, an independent-samples *t*-test was utilized. Nonetheless, verifying data normality is a fundamental condition for executing this parametric test. Thus, the Kolmogorov-Smirnov test was employed, the outcomes of which are delineated in Table 2.

Table 2

Kolmogorov-Smirnov Test of Normality on the Pre-Treatment Data

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
RT1	Experimental	.156	12	.200*	.949	12	.628
	Control	.159	11	.200*	.926	11	.371

Note. Sig. values for the Kolmogorov-Smirnov test in bold indicating the existence of normality. RT1 = pre-treatment reflective teaching.

[a]Lilliefors Significance Correction. *This is a lower bound of the true significance.

As depicted in Table 2, the significance (Sig.) levels from the Kolmogorov-Smirnov test for the scores exceeded the threshold of .05, signifying that the distribution of the data was normal, as per Tabachnick and Fidell (2013). Descriptive statistics for the hypothesized construct are detailed in Table 3. Furthermore, the outcomes derived from the *t*-test are outlined in Table 4.

Table 3

Descriptive Statistics of Pre-Treatment Scores in the Two Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
RT1	Experimental	12	102.67	13.32	3.85
	Control	11	100.18	14.68	4.43

Note. RT1 = pre-treatment reflective teaching.

Table 4

Independent Samples t-Test for Pre-Treatment Scores

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
RT1	Equal variances assumed	.195	.663	.426	21	.675	2.485	5.838	-9.657	14.63
	Equal variances not assumed			.424	20.28	.676	2.485	5.864	-9.74	14.71

Note. RT1 = pre-treatment reflective teaching.

The analysis revealed no substantial disparity in RT scores between the experimental group (M = 102.67, SD = 13.32) and the control group (M = 100.18, SD = 14.68), as evidenced by the t-test (t (21) = .426, p = .675, two-tailed). The magnitude of the differences in the means (mean difference = 2.485, 95% *CI*: -9.657 to 14.63) was minimal (*eta squared* = .009, indicating a small effect size), confirming the pre-treatment homogeneity of RT among participants. Such homogeneity validates the attribution of any post-treatment variations in participant behavior to the administered treatments. Subsequent sections will delve into and contrast the post-treatment scores.

3.2. Answering the Research Question

In the current study, participants were subjected to two distinct pedagogical strategies within the instructional courses, with the research objective focusing on assessing the differential impact on RT between the experimental and control cohorts. To facilitate a robust comparison, the data were meticulously analyzed using an independent-samples t-test. A foundational step in this process involved verifying the normal distribution of the dataset, a prerequisite for the validity of the parametric test employed. The Kolmogorov-Smirnov test served as the statistical tool for this verification, and the results, which are integral to the subsequent analysis, are systematically presented in Table 5.

Table 5

Kolmogorov-Smirnov Test of Normality on the Post-Treatment Reflective Teaching Scores

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
RT2	Experimental	.176	12	.200*	.957	12	.735
	Control	.178	11	.200*	.945	11	.583

Note. Sig. values for the Kolmogorov-Smirnov test in bold indicating the existence of normality. RT2 = post-treatment reflective teaching.

[a]Lilliefors Significance Correction. * This is a lower bound of the true significance.

Table 5 illustrates that the significance (Sig.) levels yielded by the Kolmogorov-Smirnov test for the scores surpassed the .05 benchmark, confirming the data's normal distribution as per the guidelines of Tabachnick and Fidell (2014) Tabachnick and Fidell (2013). The descriptive statistics for the scores across both groups are systematically compiled in Table 6. Additionally, the independent-samples t-test findings are concisely documented in Table 7.

Table 6

Descriptive Statistics of Post-Treatment Reflective Teaching Scores

	Group	N	Mean	Std. Deviation	Std. Error Mean
RT2	Experimental	12	120.75	10.18	2.939
	Control	11	108.55	12.52	3.774

Note. RT2 = post-treatment reflective teaching.

Table 7

Independent Samples t-Test for Post-Treatment Reflective Teaching Scores

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
RT2	Equal variances assumed	.457	.506	2.575	21	.018	12.205	4.739	2.35	22.06
	Equal variances not assumed			2.551	19.341	.019	12.205	4.783	2.2	22.20

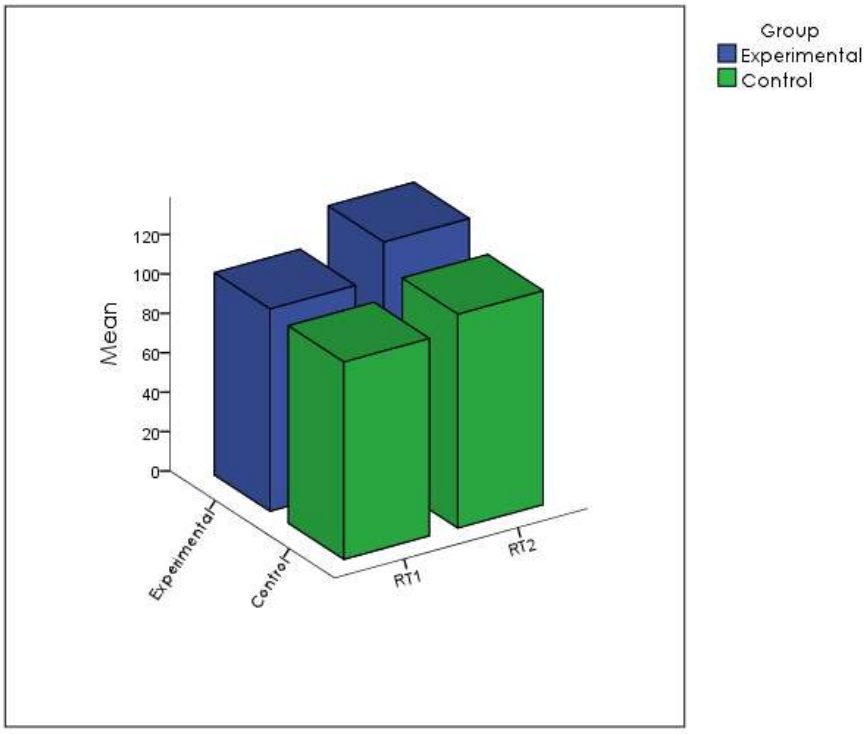
Note. RT2 = post-treatment reflective teaching.

The results demonstrated a notable distinction in the post-treatment RT between the experimental group (M = 120.75, SD = 10.18) and the control group (M = 108.55, SD = 12.52), as indicated by the t-test (t (21)

= 2.575, p = .018, two-tailed). The magnitude of the differences in the means (mean difference = 12.205, 95% *CI*: 2.35 to 22.06) was large (*eta squared* = .2399, indicating a large effect size), suggesting that the CAPR was significantly more effective in enhancing the RT of EFL teachers. For a visual representation, Figure 1 provides comparative charts to illustrate the contrast between the pre-treatment and post-treatment scores among the experimental conditions.

Figure 1

Comparative three-dimensional chart of pre-treatment and post-treatment reflective teaching scores categorized based on the received treatment.



Note. RT1 = pre-treatment reflective teaching; RT2 = post-treatment reflective teaching.

4. DISCUSSION

Educating ELT professionals in the art of reflective practice and critical analysis of instructional occurrences finds its rationale within the constructivist framework (Zaker et al., 2019). This approach underscores the importance of self-guided exploration and individualized logic in the mastery of a particular field (Creswell, 2014). Building on this foundation, the current research, conducted within a teacher education setting, sought to evaluate the effects of applying the CAPR as a systematic and standards-based reflective method on the RT of EFL instructors.

In the conducted quasi-experimental investigation, RT was operationalized as the dependent variable, while the independent variable was delineated by the presence or absence of the CAPR, constituting a binary treatment modality. Ensuring the uniformity of participants' RT prior to the intervention was a critical step, which was duly verified. This foundational homogeneity permitted the attribution of any discernible post-treatment differences in RT to the administered treatment. After satisfying the prerequisites for parametric

testing, the results from the independent-samples *t*-test (t (21) = 2.575, p = .018, two-tailed) revealed that the application of CAPR significantly enhanced the RT of EFL educators.

The evidence garnered from this study lends robust empirical support to the proposition that ELT professionals' meticulous and evaluative scrutiny of educational practices—whether in the act of teaching or during the process of learning to teach—can significantly bolster their professional competencies (Akbari, 2008; Lightbown & Spada, 2013). Furthermore, the data underscore the imperative for teacher education programs to prioritize the active engagement of trainee teachers in their learning journey; a lack of such engagement is likely to yield suboptimal results (Farrell, 2012). Essentially, this research also resonates with the idea that deliberate and conscious reflection on one's practice or subject matter can act as a bulwark against professional burnout, sustain intrinsic motivation, and foster more favorable outcomes (Dewey, 1933) (Dewey, 1933).

While the outcomes of this study are promising, it is important to acknowledge certain limitations that may affect the breadth of interpretation and the extent to which these findings can be generalized, as is common in research endeavors (Mackey & Gass, 2015). A primary consideration is the novelty of the research objectives, which precludes direct comparison with prior studies due to the absence of similar investigations. Additionally, the gender distribution within the sample was uneven, introducing the possibility of gender as a confounding variable. The method of sample selection also relied on convenience sampling, which may limit the representativeness of the sample. Lastly, the inherent diversity and impact of participants' internal factors, as well as contextual elements specific to the ELT field, could have a bearing on the study's results (Best & Kahn, 2006; Tabachnick & Fidell, 2013). Consequently, these factors necessitate a cautious approach when interpreting the results (Creswell, 2014).

5. CONCLUSION

In tandem with the burgeoning acceptance of the constructivist approach to cognitive and intellectual growth (Ashton-Hay, 2006; Zaker, 2016), the field of ELT is increasingly emphasizing the importance of educators' critical cognitive involvement in instructional scenarios (Farrell, 2012; Kumaravadivelu, 2012; Zaker et al., 2020). This has led to the recognition of deliberate and methodical reflection on teaching methodologies as a cornerstone of teacher training (Akbari, 2008). The adoption of CAPR is a manifestation of this evolving paradigm, addressing a niche yet vital aspect of teacher education: research literacy. The preference for CAPR's integration reflects a broader aspiration to enhance EFL teachers' proficiency in executing research within the context of language instruction. Research, as Farrell (2012) and Jay and Johnson (2002) assert, can substantially enrich ELT professionals' comprehension of the discipline and advance instructional strategies.

The evolving landscape of the ELT field, marked by the introduction of novel challenges and pedagogical queries (Ellis, 2010; Lightbown & Spada, 2013; Mitchell et al., 2013), has precipitated the development of innovative research methodologies within ELT settings (Mackey & Gass, 2015). This shift necessitates that both seasoned researchers and TEFL students enhance their research acumen to effectively tackle diverse educational issues (Blessinger, 2015; Zaker & Nosratinia, 2021). The findings from this quasi-experimental study, conducted within the framework of an undergraduate research course, revealed that the application of CAPR significantly improved the RT of EFL teachers. These results bolster the argument, both empirically and statistically, that teacher training programs should be designed to immerse students in an

intellectually stimulating environment that encourages the practical application of theoretical knowledge. Moreover, the data lend credence to the notion that the active participation of trainee teachers in the learning process is instrumental in fostering their skill development (Farrell, 2012).

The adoption of CAPR is posited as a significant stride in augmenting the self-directed practices of TEFL professionals, which Little (1991) articulates as the ability "for detachment, critical reflection, decision-making, and independent action" (p. 4). An ELT educator who exercises autonomy is not reliant on external guidance for their instructional choices (Nosratinia & Zaker, 2017), and CAPR emerges as a pivotal mechanism for actualizing such self-governance. In light of this study's insights, it is advocated that EFL teacher educators across both scholarly and practical realms integrate CAPR as a fundamental component of the pedagogical curriculum. This integration should transcend research-focused courses, underscoring its broader applicability. Additionally, CAPR's methodologies and exercises are proposed to be integral to the evaluative framework. Given the scope, methodology, and constraints of this investigation, it is recommended for future research to:

- Replicate this inquiry at the graduate level to determine if consistent outcomes are observed;
- Ensure gender parity in participant selection to broaden the applicability of the results;
- Utilize pure/simple random sampling in replication efforts to bolster the findings' validity;
- Incorporate qualitative tools and triangulation in replication to fortify the results' credibility and interpretive depth;
- Extend the application of CAPR to diverse teacher training courses to assess its broader educational impact; and
- Concurrently evaluate the cognitive and mental faculties of participants alongside their RT metrics.

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