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| RESEARCH ARTICLE

The Effect of Reflective Journal Writing on Moroccan EFL Master Students' Reflective Thinking: A Mixed Methods Study

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| ABSTRACT
Reflective thinking is one of the transferable skills necessary for academic and professional success. Therefore, stimulating English as a foreign language (EFL) students' reflective skills is undoubtedly important. Reflective journal writing is a pedagogical strategy proposed to help students build their reflective potential. Although previous research investigated the effect of this strategy on the development of students' reflective skills, there are inconsistent conclusions regarding its effectiveness. Also, limited research has investigated this issue in relation to EFL students in the Moroccan context, specifically in higher education. The aim of this study is to evaluate the effectiveness of reflective journal writing in improving EFL master students reflective thinking. A convergent mixed methods approach associated with a quasi-experimental design was adopted. To collect quantitative and qualitative data, Kember, Leung, et al (2000) Reflective Thinking Questionnaire and reflective journal writing were used, respectively. A purposive sample of 69 EFL master students, including two intact groups, took part in the study. They were randomly assigned to experimental (n = 39) and control groups (n = 30). Quantitative results and qualitative findings revealed that the experimental group, after using reflective journals, has significantly developed reflective thinking compared to the control group. Also, a statistically significant change over time in the experimental group level of reflective thinking was observed. As it can be inferred, reflective journal writing is an effective strategy which could be used to help EFL students engage in a reflective reasoning. Accordingly, the results of this study encourage the formalization of reflective practice as a didactic approach to stimulate EFL students' reflective thinking at the tertiary level.

| KEYWORDS

Reflective thinking, reflective journal writing, reflective teaching pedagogy, higher education

| ARTICLE INFORMATION

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1. Introduction

It is unanimously agreed that reflective thinking is a central transversal and in-demand skill for EFL university students as they are constantly required to exhibit this skill to solve problems, make well-thought-out decisions, take effective actions in their learning, and adopt a skeptical stance throughout their academic journey and even beyond the confines of the college. Cultivating students' ability for reflective thinking is therefore an objective of higher education (Leijen et al., 2012). Reflective writing (i.e., reflective journals, portfolios, or learning journals, among others) is proposed as a pedagogical strategy to stimulate students' reflective thinking and help them achieve higher order reflection. In this regard, a plethora of studies (e.g., Ayan & Seferoglu, 2011; Fakude & Bruce, 2003; Farahian et al., 2020; Greiman & Covington, 2007; Kok & Chabeli, 2002; Lew & Schmidt, 2011a; Mansvelder-Longayroux et al., 2007; Meyers, 2006; Pavlovich, 2007; Scott, 2010; Sultana et al., 2020; Tigelaar et al., 2006; Tsingos-Lucas et al., 2016) were conducted to evaluate its effectiveness on the development of students' reflective thinking. In reviewing these past studies, the following inconsistences were identified. First, the results of these studies have been inconsistent regarding the effectiveness of reflective writing in helping students to reflect in complex fashions. Second, few attempts have been made to investigate this issue in the context of EFL higher education in Morocco. This research, therefore, addressed a two-dimensional

gap. First, there is no conclusive evidence that reflective journal writing adequately facilitates the improvement of reflective thinking. Second, little research has investigated this issue in the Moroccan context, specifically in EFL higher education. The main aim of this mixed methods study was to evaluate the effectiveness of reflective journal writing in enabling Moroccan EFL master students to engage fully in profound reflection, a much-needed endeavor for them to move beyond merely acquiring knowledge, as they would be able to engage in productive and active thinking rather than reproductive and passive thinking. The outcomes of this investigation would contribute to setting up a reflective culture and formalizing reflective practice as a didactic approach through explicitly and formally inseminating a reflective pedagogy across the English language curriculum in Moroccan universities.

1.1 Reflective Thinking and EFL University Students

Building and improving EFL university students' thinking skills, specifically reflective thinking, is among the priorities of Moroccan higher education today. This is supported by two overarching reasons, notably pedagogical and socio-economic.

First, reflective thinking plays a key role in improving the quality of learning. This thinking skill has the potential to promote higher order cognitive skills (Song et al., 2005), deepen learning (Grant et al., 2017), deepen understanding (Kettler, 2017; Moon, 2004), enhance meaningful learning (Kish et al., 1997; Moon, 2004), foster autonomous and lifelong learning (Bharuthram, 2018; O'Connell & Dyment, 2013; Kathpalia & Heah, 2008; Plack & Greenberg, 2005; Rogers, 2001; Sultana et al., 2020; Tsingos-Lucas et al., 2016), improve metacognition (Kettler, 2017; Verpoorten et al., 2011), promote independence and self-regulated skills (Kettler, 2017), encourage transformative learning (Mezirow, 1991, 1997), and promote active learning (Boud, 2001; Park, 2003). Additionally, it boosts problem solving skills, helps students to mull over and analyze things, encourages communication of diverging standpoints, and develops self-awareness (Kish et al., 1997). The major tenet of reflection is this active engagement of students in the learning process which positively impacts their understanding, learning, memory, and interest (Park, 2003). For this reason, reflective learners exhibit superior academic performance (Lew & Schmidt, 2011b). The importance of reflective thinking is not limited to the enhancement of quality learning, but also research as well. At master's level, students are called upon to do research. This thinking skill is pivotal in research as the reflective researcher reports the research results and also reflects on them (Hertz, 1997, as cited in Mortari, 2015). Moreover, at this level, EFL students are expected to demonstrate their ability to solve problems, evaluate, use advanced reasoning, and develop hypotheses; all of which are evidence of reflective thinking (Ghanizadeh & Jahedizadeh, 2017).

Second, reflective thinking enables students not only to succeed academically, but also to integrate the work market, advance their careers, and succeed professionally. It is an important and strategic soft skill which makes its utility goes beyond classroom boundaries into daily life (Joseph, 2006). It is a prerequisite to lifelong learning (O'Connell & Dyment, 2013; Plack & Greenberg, 2005; Rogers, 2001), decision making and problem solving (Moon, 1999a, 1999b), professional development (Chretien et al., 2008; Osterman, 1990; Moon, 2004, 2006, 2007; Neville, 2018; Simpson & Freeman, 2004), professional competence (Mann et al., 2009; Rogers, 2001), professional practice (Plack & Greenberg, 2005), professional growth (Chretien et al., 2008; Grant et al., 2017; Osterman, 1990; Moon, 2007; Neville, 2018), and professionalism (Mofidi et al., 2003; Vernazza et al., 2011).

1.2 Development of Reflective Thinking Through Reflective Journal Writing

Journal writing is mainly a vehicle for reflection (Moon, 2006) because it allows students to parse their personal experiences be they thoughts, feelings, or actions. For this reason, it is one of the diverse teaching strategies used in the educational setting to promote reflective skills (Rivera, 2017) and facilitate university students' deep reflection (Dyment & O'Connell, 2011). Reflective journal writing stimulates reflective thinking in many ways. First, it forces students to be less descriptive, makes them engage in higher order thinking and critical reflection, and allows them to be inquisitive and creative (Dyment & O'Connell, 2011). Reflective journal writing has this particularity of helping students to stand apart from their experiences and critically examine the what, how, when, and why of things (O'Connell & Dyment, 2013). These WH-questions permit considering things from different perspectives involving different levels of thinking and therefore leading to an in-depth analysis. Put differently, this neutral stand enables EFL students to look at things with an objective eye using a scientific and logical way of thinking, that is, starting with describing things (what, when); then moving to a profound form of thinking entailing analysis and evaluation (why, how); and based on the conclusions, taking an action plan (now what). Second, it permits students to examine and explore their thoughts (Sanford, 1988) by articulating and voicing them through writing (Kathpalia & Heah, 2008). Third, it makes them intentionally think and change the habitual thinking (Javis, 2001); and therefore, it prevents what Dewey (1933) names routine thinking. Additionally, journal writing is a form of reflective practice, as it offers opportunity as well as time to practice reflective thinking (Kaplan et al., 2007).

Though the above-stated arguments support the important role of reflective journal writing in stimulating students' reflective thinking, there is a lack of empirical evidence to prove this causality because the results of previous studies are inconsistent. Also, little research has investigated this issue in the Moroccan context, specifically in EFL higher education. Therefore, this study aims to investigate the effect of reflective journal writing on EFL master students' reflective thinking in the Moroccan context. To achieve this aim, five guiding research questions were formulated: three quantitative questions with their corresponding null and alternative hypotheses, one qualitative question, and one mixed methods question which is method-oriented.

QUANT RQ1: Is there a statistically significant difference between EFL master students who were exposed to reflective journal writing treatment compared to those who were not regarding their level of reflective thinking?
H_{01}: There is no statistically significant difference between EFL master students who were exposed to reflective journal writing treatment compared to those who were not regarding their levels of reflective thinking.

H_{a1}: There is a statistically significant difference between EFL master students who were exposed to reflective journal writing treatment compared to those who were not regarding their level of reflective thinking.

QUAN RQ2: Is there a statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the experimental group?

H_{02}: There is no statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the experimental group.

H_{a2}: There a statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the experimental group.

QUAN RQ3: Is there a statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the control group?

H_{03}: There is no statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the control group.

H_{a3}: There is a statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the control group.

QUAL RQ: What is the level and depth of reflective thinking that is stimulated through reflective journal writing among EFL master students?

MM RQ: To what extent do the qualitative findings confirm the quantitative results?

2. Methods

2.1 Research Design

To best address the above-stated research questions, this study adopts a concurrent mixed methods approach associated with a quasi-experimental design, specifically, a mixed design. The logical basis for adopting this type of mixed methods design was to have a holistic picture, achieve credibility and corroboration, validate conclusions, and also address the research problem from different perspectives (Creswell & Plano Clark, 2018).

2.2 Research Sites and Sample

This study was conducted at two public universities situated in Morocco, namely Ibn Tofail University of Kenitra and Moulay Ismail University of Meknes. These research sites were mainly selected for their convenience. Conducting research in other universities requires time, financial means, and collaboration. The process of the intervention and data collection necessitated the presence of the researcher in both research sites and the constant contact with the subjects during an eight-week period. Therefore, it was difficult to undertake this intervention in other sites by only one person. Additionally, due to COVID-19 pandemic situation and the recommended preventive measures, conducting research in other universities was difficult.

The selected sample included the entire accessible population given its small size (N = 86) (all EFL S 3 master students enrolled in the Master of TEFL at Ibn Tofail University of Kenitra and all EFL S 1 master students enrolled in the Master of Applied Language Studies at Moulay Ismail University of Meknes). They were enrolled in the department of English studies during the academic year 2021-2022. Table 1 displays the response and attrition rates.

Table 1

Response and Attrition Rates

Group	n	Consented to participate	Completed the study	Response rate %	Attrition rate %
Experimental	49	47	39	82.98	20.51
Control	37	37	30	81.08	18.91
Total	86	84	69	82.14	20.23

Note. The study used two intact groups.

This study used a purposive sampling method which permits investigating a specific population consisting of Moroccan EFL adults who are enrolled in master programs specialized in applied linguistics and English language teaching, are enrolled in the English department at public universities, have an advanced level in English, and master writing skill. It is worth noting that the anonymity and confidentiality of subjects, who voluntarily consented to take part in this study, were preserved by masking any aspects of their identity and using numerical codes.

2.3 Instruments

The instruments used for both quantitative and qualitative data collection were Kember, Leung, et al. (2000) Reflective Thinking Questionnaire (RTQ) and reflective journal writing, respectively. Kember, Leung, et al. (2000) RTQ was designed to assess students' ability to think reflectively and to measure their reflective thinking level (Lethbridge et al., 2013; Moon, 2004; Kember, Leung, et al. 2000). It is a four-scale instrument that measures four constructs, namely Habitual action, Understanding, Reflection, and Critical reflection. Given that this is a published instrument, its reliability has been validated by several researchers (e.g., Kember, Leung, et al., 2000; Lethbridge et al., 2013; Lim, 2011). In this study, Cronbach's alpha coefficient was used to calculate if the reliability of this instrument is internally consistent. Cronbach's alpha was run using SPSS version 26. The alpha values for each of the four scales were computed. The Habitual Action scale, consisting of four items, was found to be highly reliable (α = .963). The Understanding scale, consisting of four items, was found to be acceptable (α = .595). The Reflection scale, consisting of four items, was found to be highly reliable (α = .947). The Critical Reflection scale, consisting of four items, was found to be highly reliable (α = .897). Reliability is acceptable or moderate when the alpha score is .5 to .75, and an alpha score above .75 indicates a high reliability (Hinton et al., 2014).

The instrumentation used for qualitative data collection was reflective journal writing as it stimulates students' reflective thinking, and at the same time it permits assessing their improvement over time and measuring their reflective level. Unlike traditional essays or dairies, journal writing can be used to encourage and demonstrate evidence for reflection (Hatton & Smith, 1995) because it is both a process and a product (Dunlap, 2006). Considering that reflective thinking has psychometric properties, it is necessary to use an evaluation means to determine students' level of reflective thinking evident in qualitative writing (Kember, McKay, et al., 2008; Plack et al., 2005). To this end, in this study, the rubric used to measure students reflective thinking level was Kember, McKay, et al. (2008) revised four-category scheme. It is a well-designed and validated framework for written reflection (Moon, 2004) used to track subjects' reflective thinking development, identify its different levels, and classify their level of reflection into categories (Bell et al., 2011).

2.4 Procedure

Given that this study was undertaken in two research sites, intact classes were used. Gliner et al. (2017) note that in the robust quasi-experimental design, the researcher controls the independent variable and can randomly assign the treatment to one intact class and the standard approach to the other. These two intact classes were randomly assigned to experimental (n = 39) and control (n = 30) groups to reduce contamination effects or treatment diffusion across the subjects of both groups (Shaldish et al., 2002, as cited in Rhoads, 2011). The fishbowl draw method (Kumar, 2019) was used for this purpose. It is worth noting that both groups were not informed of which group they belonged to prevent the Hawthorne effect or expectancy effect (Fraenkel et al., 2012).

Prior to the intervention, all subjects took the same pretest measures to determine the baseline level of reflective thinking. A total of 69 questionnaires, which were administered in person to the subjects, were completed; and 69 writing tasks were submitted. After that, the reflective journal writing treatment was administered to the experimental group. A tutorial session was devoted to initiate the subjects of this group to the concept of reflective thinking and reflective journal writing. To facilitate this process and help them schematize and materialize the reflective process, Driscoll's reflective model (2007) was used. Globally, they submitted one reflective journal per week and this process extended over an eight-week period. Subjects of the control group received no treatment and as with the experimental group, they submitted one traditional essay per week during eight weeks. Subjects of both groups wrote their writing tasks at home after university courses and on a weekly basis. At the eighth week, both groups took the

same questionnaire as a posttest measure to determine changes in their level of reflective thinking. It was administered in person to the subjects. A total of 69 questionnaires were completed, and 69 writing tasks were submitted.

2.5 Data Analysis

2.5.1 Quantitative data analysis

A total of 138 questionnaires, including 69 questionnaires (39 questionnaires for the experimental group and 30 for the control group) were subjected to quantitative data analysis as a pretest measure and 69 questionnaires as a posttest measure. Quantitative data analysis was realized following a two-step process consisting of preparing the data for analysis and analyzing the data using both descriptive and inferential statistics computed with the SPSS software (version 26).

2.5.2 Qualitative Data Analysis

A total of 138 writing tasks, including 69 writing tasks (39 reflective journals and 30 traditional essays) were subjected to data analysis as a qualitative pretest measure and 69 writing tasks (39 reflective journals and 30 traditional essays) as a qualitative posttest measure. Qualitative data were analyzed using quantitative content analysis (Poldner et al., 2012). This analysis is used in qualitative studies in which the qualitative data are coded, and then codes frequency is counted (Krippendorff, 2013). The analytical technique used was deductive coding because to identify both evidence and depth of reflection in subjects' writing tasks; a pre-established coding scheme, i.e., Kember, McKay, et al. (2008) four-category scheme was used. The content of each piece of writing was analyzed and categorized as non-reflective, demonstrating understanding, reflective, and highly reflective. The process of coding was realized manually using a holistic approach, that is, at the whole paper level because "the pieces of writing normally consist of parts that go together to make a whole" (Kember, McKay, et al., 2008, p. 372). This coding process was independently realized by two coders or scorers. Patton (2015, p. 963) refers to using more than one scorer as "analyst triangulation" because it implies an independent analysis of the same qualitative data by two or more scorers and the comparison of their findings. The scores of both coders were statistically compared to assess interrater reliability using kappa statistics and interrater agreement using percentage (McHugh, 2012).

Results of kappa statistics showed a good agreement between the two raters for the four levels of reflective thinking in both groups, k = 0.878 [95% CI, 0.805 to 0.950], $p < .001$. According to Landis and Koch (1977), the strength of agreement is almost perfect when kappa statistic ranges between 0.81 and 1.00. Interrater agreement was also assessed through percent agreement. Table 2 shows a detailed account of the percentage of journals for each level of reflective thinking coded by two raters at two time points.

Table 2

Percentage of Journals for Each Level of Reflective Thinking Coded by two Raters at two Time Points

Levels of RT	Rater 1								Rater 2							
	Pretest				Posttest				Pretest				Posttest			
	Cont		Exp		Cont		Exp		Cont		Exp		Cont		Exp	
	F	%	*F*	%	*F*	%	*F*	%	*F*	%	*F*	%	*F*	%	*F*	%
NR	25	83.3	24	61.5	21	70	5	12.8	25	83.3	26	66.7	22	73.3	7	17.9
U	5	16.7	15	35.5	9	30	9	23.1	5	16.7	13	33.3	8	26.7	7	17.9
R	0	0	0	0	0	0	21	53.8	0	0	0	0	0	0	20	51.3
CR	0	0	0	0	0	0	4	10.3	0	0	0	0	0	0	5	12.8
Total	30	100	39	100	30	100	39	100	30	100	39	100	30	100	39	100

Note. F= Frequency, NR= Non-reflective, U= Understanding, R= Reflective, and CR= Critically reflective.

Globally, out of 138 writing tasks, the two raters agreed on 128. Thus, the percentage agreement between them was 92.7%. Based on the above, the results of both kappa statistics and percent agreement show a strong concordance between the two raters.

Qualitative data were quantitized by transforming codes into quantitative data (variables) for the sake of comparing and merging both sets of data (Creswell & Plano Clark, 2018) and also using statistical measures (Hesse-Biber, 2010). The purpose of merging quantitative results and qualitative findings was to answer the mixed methods research question. The representation of the integrated results was realized via a joint display approach (Creswell & Plano Clark, 2018; Schoonenboom & Johnson, 2017).

3. Results and Findings

3.1 Quantitative Research Question One

To test the null hypothesis for QUANT RQ1 (H_{01}: There is no a significant difference between EFL master students' level of reflective thinking who were exposed to reflective journal writing treatment compared to those who were not), independent *t*-test was

intended to be used. Laerd (2018a) notes that meeting a set of assumptions is necessary for this parametric test to provide valid results, among which normality and homogeneity of variances. First, the assumption of normality was tested using non-graphical tests, namely Kolmogorov-Smirnov and Shapiro-wilk tests (Verma & Abdel-Salam, 2019). Table 3 displays the results of these tests.

Table 3

Tests of Normality for the Data on Reflective Thinking

RTQ Variables	Time	Group	Kolmogorov-Smirnov			Shapiro-Wilk		
			Statistics	*df*	*p*	*W* Statistics	*df*	*p*
Habitual Action	Pretest	Cont	.451	120	< .001	.564	120	< .001
		Exp	.491	156	< .001	.488	156	< .001
	Posttest	Cont	.426	120	< .001	.595	120	< .001
		Exp	.277	156	< .001	.814	156	< .001
Understanding	Pretest	Cont	.343	120	< .001	.785	120	< .001
		Exp	.281	156	< .001	.836	156	< .001
	Posttest	Cont	.350	120	< .001	.789	120	< .001
		Exp	.306	156	< .001	.646	156	< .001
Reflection	Pretest	Cont	.436	120	< .001	.626	120	< .001
		Exp	.385	156	< .001	.704	156	< .001
	Posttest	Cont	.365	120	< .001	.704	120	< .001
		Exp	.299	156	< .001	.835	156	< .001
Critical Reflection	Pretest	Cont	.380	120	< .001	.701	120	< .001
		Exp	.419	156	< .001	.650	156	< .001
	Posttest	Cont	.365	120	< .001	.682	120	< .001
		Exp	.322	156	< .001	.811	156	< .001

Note: Significant level set at 5%, $p < .05$ indicating a violation in normality.

As shown in table 3, the *p* values of both tests are less than the critical value ($p < .05$). There is sufficient evidence to conclude that the four variables in the pretest and posttest do not follow a normal distribution.

Second, the assumption of homogeneity was tested using Levene's test (Laerd, 2018a; Verma & Abdel-Salam, 2019). Table 4 displays the results of Levene's test for the four dependent variables.

Table 4

Levene's Test for Pretest and Posttest on the Levels of Reflective Thinking

Levels of Reflective Thinking	Time	*F*	*p*
Habitual Action	Pretest	10.503	< .001*
	Posttest	199.378	< .001*
Understanding	Pretest	16.836	< .001*
	Posttest	120.892	< .001*
Reflection	Pretest	1.565	.212
	Posttest	133.192	< .001*
Critical Reflection	Pretest	2.021	.156
	Posttest	214.420	< .001*

Note. df1 = 1, *df2* = 274.

*Significant at $p < .05$ level indicating a violation in homogeneity.

As shown in table 4, data analysis demonstrated that equal variances were not assumed across groups in both the pretest and posttest since the results were not statistically significant at the $p < .05$ level (Warmer, 2021) for Habitual action and Understanding in both the pretest and posttest, and for Reflection and Critical Reflection in the posttest.

Based on these results, both normality and homogeneity assumptions required to undertake independent *t*-test analysis were violated for research question one. The alternative non-parametric test to the independent *t*-test which is Mann-Whitney U test was used (Verma & Abdel-Salam, 2019). It is worth noting that to measure the magnitude of the perceived effect, effect size *r* for Mann-Whitney U test was computed manually using Rosenthal (1991, as cited in Field, 2018) formula, and interpreted based on

Cohen's standard (0.1 = small effect, 0.3 = medium effect, and 0.5 = large effect). Table 5 presents a summative account of the results of Mann-Whitney U test.

Table 5

Results of Mann-Whitney U Test and Effect Size with Interpretation by Groups

Variables	*N*	Time	Group	Mean Rank	*U*	*p*	*r*	Interpretation
HA	120	Pretest	Cont	145	8568	.101	0.09	Small
	156		Exp	133				
	120	Posttest	Cont	96	2780	< .001*	0.64	Large
	156		Exp	193				
U	120	Pretest	Cont	159	6869	< .001*	0.23	Small
	156		Exp	122				
	120	Posttest	Cont	110	6027	< .001*	0.33	Medium
	156		Exp	159				
R	120	Pretest	Cont	138	9340	.970	0.002	Small
	156		Exp	138				
	120	Posttest	Cont	83	2784	< .001*	0.63	Large
	156		Exp	180				
CR	120	Pretest	Cont	136	9094	.621	0.029	Small
	156		Exp	140				
	120	Posttest	Cont	90	3639	< .001*	0.57	Large
	156		Exp	175				

Note. HA = Habitual action, U = Understanding, R = Reflection, CR = Critical reflection.
*Significant at $p < .05$ level, two-tailed.

Bases on these results, the null hypothesis for QUANT RQ1 can be rejected as there is sufficient evidence to conclude that the experimental group, who was exposed to reflective journal writing intervention, demonstrated significant differences in the level of reflective thinking skills compared to the control group.

3.2 Quantitative Research Questions Two and Three

To test the null hypotheses for QUANT RQ2 (H_{02}: There is no statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the experimental group) and QUANT RQ3 (H_{03}: There is no statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the control group), data were submitted to the test of assumptions for dependent *t*-test. As shown previously in table 3, the normality assumption was violated for the two repeated measures, that is, the pretest and posttest for the control and experimental groups. The Kolmogorov-Smirnov and Shapiro-Wilk tests demonstrated a significant departure from normality as the *p* values of both tests are less than the critical value ($p < .05$). Based on this outcome, the alternative non-parametric test to the dependent *t*-test, which is Wilcoxon Signed-rank test (Verma & Abdel-Salam, 2019) was used to test the null hypotheses for QUANT RQ 2 and QUANT RQ 3. However, to run this test, the distribution of the differences between the matched groups has to be symmetrical in shape (Laerd, 2018b). This assumption was checked through Box and Whisker Plots. Figures 1 to 8 below display the box and whisker plots showing the shape of distribution of matched groups for pretest and posttest for both the experimental and control groups.

Figure 1

Shape of Distribution of Exp Gr for Habitual Action-Pretest/Posttest

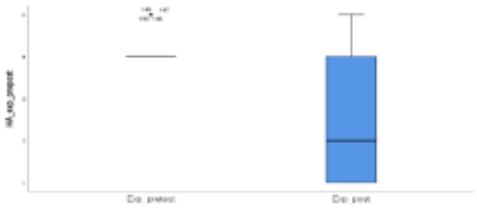


Figure 2

Shape of Distribution of Exp Gr for Understanding-Pretest/Posttest

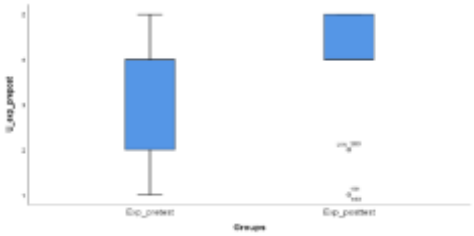


Figure 3

Shape of Distribution of Exp Gr for Reflection-Pretest/Posttest

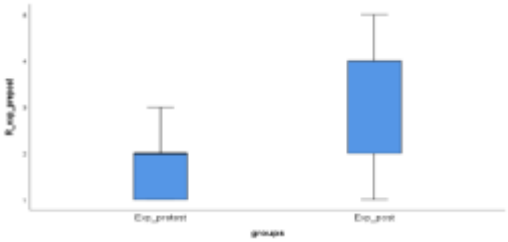


Figure 4

Shape of Distribution of Exp Gr for Critical Reflection-Pretest/Posttest

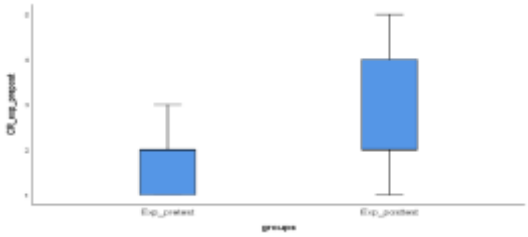


Figure 5

Shape of Distribution of Control Gr for Habitual Action-Pretest/Posttest

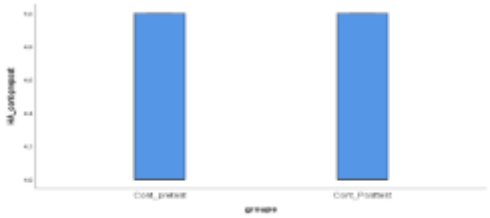


Figure 6

Shape of Distribution of Control Gr for Understanding-Pretest/Posttest

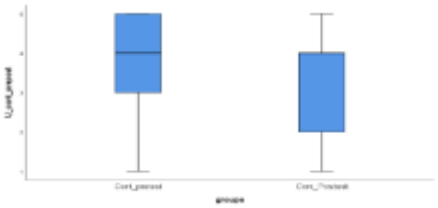


Figure 7

Shape of Distribution of Control Gr for Reflection-Pretest/Posttest

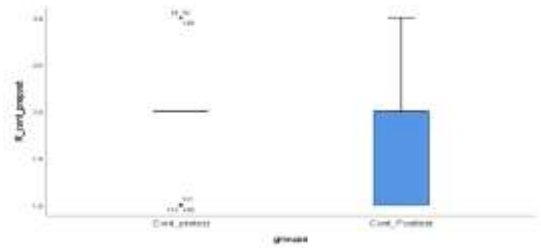
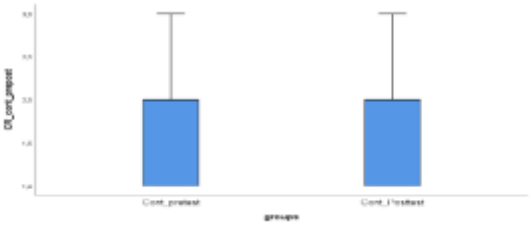


Figure 8

Shape of Distribution of Control Gr for Critical Reflection-Pretest/Posttest



As shown above, figures 5 and 8 demonstrate that the shape of distribution of the differences between the matched groups is symmetrical. Therefore, Wilcoxon Signed-rank test was used (Laerd, 2018b). However, figures 1, 2, 3, 4, 6, and 7 show that the shape of distribution of differences between the related groups is asymmetrical. Since this assumption is violated, Sign test was

used (King & Eckersley, 2019; Laerd, 2018b). Based on these results, the Sign test was computed to determine whether there is a statistically significant difference between levels of reflective thinking (habitual action, understanding, reflection, and critical reflection) both at the pretest and the posttest among subjects in the experimental group. Wilcoxon Signed-rank test was run to determine whether there is a statistically significant difference between levels of reflective thinking (habitual action and critical reflection) both at the pretest and at the posttest among subjects in the control group. The Sign test was run to determine whether there is a statistically significant difference between levels of reflective thinking (understanding and reflection) both at the pretest and at the posttest among subjects in the control group. As mentioned earlier, the results of both tests were interpreted using alpha level. A *p* value of .05 was used to indicate a significant difference between the pretest and posttest. It is worth noting that to measure the magnitude of the perceived effect, effect size *r* for Wilcoxon Signed-rank and Sign tests was computed manually using Rosenthal (1991, as cited in Field, 2018) formula, and interpreted based on Cohen's standard (0.1 = small effect, 0.3 = medium effect, and 0.5 = large effect). To interpret the results, the Wilcoxon *T* value and the sum of the ranks along with the *z*-score and *p* value were reported (Corder & Foreman, 2014). Table 6 summarizes the results of the Sign test and Wilcoxon Signed-rank test.

Table 6

Results of Wilcoxon Signed-Rank and Sign Tests for Levels of Reflective Thinking

Variables	Group	Time	*N*	Test	*mdn*	*z*	*p*	*r*	Interpretation
HA	Cont	Pre	120	Wilcoxon	4	-.866	.386	0.08	Small
		Post	120		4				
	Exp	Pre	156	Sign	4	-9.298	$p < .001$*	0.74	Large
		Post	156		2				
U	Cont	Pre	120	Sign	4	-1.354	.176	0.12	Small
		Post	120		4				
	Exp	Pre	156	Sign	4	-7.409	$p < .001$*	0.59	Large
		Post	156		4				
R	Cont	Pre	120	Sign	2	-1.562	.118	0.14	Small
		Post	120		2				
	Exp	Pre	156	Sign	2	-9.070	$p < .001$*	0.72	Large
		Post	156		4				
CR	Cont	Pre	120	Wilcoxon	2	-1.752	.080	0.16	Small
		Post	120		2				
	Exp	Pre	156	Sign	2	-7.761	$p < .001$*	0.62	Large
		Post	156		2				

Note. HA = Habitual action, U = Understanding, R = Reflection, CR = Critical reflection.

[a]The *z* values for Wilcoxon Signed rank test were reported for Habitual Action and Critical Reflection for the Control group as the shape of distribution of the differences between the matched groups is symmetrical.
*Significant at $p < .05$ level, two tailed.

Based on these results, the null hypothesis for QUAN RQ2 can be rejected because there is sufficient evidence to support the claim that there is a significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the experimental group. However, we fail to reject the null hypothesis for QUAN RQ3 as there is not sufficient evidence to support the claim that there is a statistically significant difference between levels of reflective thinking at the pretest and levels of reflective thinking at the posttest among subjects in the control group.

3.3 Qualitative Research Question

3.3.1 Classification According to Kember, McKay, et al. (2008) Coding Scheme

To address the qualitative research question (QUAL RQ: What is the level and depth of reflective thinking that is stimulated through reflective journal writing among EFL master students?), Kember, McKay, et al. (2008) coding scheme was used to assess students' level or depth of reflective thinking exhibited in their writing tasks, be they reflective journals or essays. As discussed earlier, the assessment was holistic. In other words, the level of analysis was at the whole paper level showing no evidence of reflective thinking, evidence of understanding, evidence of reflection, and evidence of critical reflection. The findings indicating the level of reflection exhibited by reflective journal users are displayed in table 7.

Table 7

Number of Journals Containing Evidence of Reflection Exhibited by Journal Users

Levels of Reflective Thinking	Pretest	%	Posttest	%	Total
Non-reflective	50	64.1	12	15.4	62
Understanding	28	35.9	16	20.5	44
Reflective	0	0	41	52.6	41
Highly Reflective	0	0	9	11.5	9
Total	78	100	78	100	156

Note. Levels of reflective thinking before and after reflective journal intervention.

Viewed proportionally, table 7 shows that in the pretest, no evidence of reflection and critical reflection was noticed in journal users' group. Contrariwise, in the posttest, journals were written at deeper levels of reflection since evidence of reflection and critical reflection was observed. Table 8 displays examples of students' text demonstrating levels of reflective thinking in journal users' group.

Table 8

Example Quote of Students' Text Demonstrating Levels of Reflective Thinking in Journal Users Group

Levels of Reflective Thinking	Example Quote
No Evidence of Reflection	Student 6: "During the session of teaching the four skills, the discussion was based on the erudite article of Eli Hinkel concerning the "Current Perspectives on Teaching the Four Skills". The article is about an overview of recent developments in L_2 teaching and highlights the trends that began in the 1990_s and the 2000_S and could affect instruction in the future". Student 14: "The professor sets the scene by eliciting and brainstorming our prior knowledge of learning theories. We focused on the behaviorism one as the traditional example to pave the way for the cognitivism theory that came as a reaction to behaviorism weaknesses".
Evidence of Understanding	Student 1: "In today's course, we discussed the three pillars of the teaching profession; namely, the teacher, the system, and the learners as being the main players affecting the teaching act. Deconstructing these three aspects helped us uncover that teaching does not happen in a vacuum and that each of the three major players in the teaching profession is affected by multiple factors and by other indirect stakeholders". Students 4: "From this course, I have learned that teaching is a profession that involves more than one party, namely the instructor, which plays the central role of transmitting "le savoir et le savoir-faire", the system, the family, and the student. I have also learned that the teaching profession does not revolve around teaching only, but rather its goal is to achieve a certain balance between rights and duties".
Evidence of Reflection	Student 1: "The theoretical knowledge I have gained helps me develop a more flexible approach and informed awareness to the grammar of English. I now better realize that the rules of grammar taught in EFL classrooms are necessary because of the lack of opportunities of exposure to English in a natural setting". Student 17: "In the future, I would like to improve my cognitive skills so as to help my students acquire and be aware of these skills". Student 27: "I still need to work more on my teaching so as to make it adhere to the principles of past method and the principle of communicative language teaching approach".
Evidence of Critical Reflection	Student 6: "My perspective has changed since the beginning of the course because I become more aware of how this teaching profession holds the idea of "being born as a teacher" is something inherent". Student 16: "In the future I will read more about the knowledge of language in order to enhance my metalinguistic awareness. Indeed, my perspective has changed about grammar since the beginning of the course".

Table 9 displays the level of reflection exhibited by journal non-users' group.

Table 9

Number of Essays Containing Evidence of Reflection Exhibited by Journal Non-Users

Levels of Reflective Thinking	Pretest	%	Posttest	%	Total
Non-reflective	50	83.3	43	71.7	93
Understanding	10	16.7	17	23.3	27
Total	60	100	60	100	120

Note. Levels of reflective thinking evidenced in the pretest and posttest.

Table 9 shows that in the pretest and posttest, all the essays were mainly written at the lowest levels of reflection since there was no evidence of reflection and critical reflection. Table 10 displays examples of students' text demonstrating levels of reflective thinking in journal non-users' group.

Table 10

Example Quote of Students' Text Demonstrating Levels of Reflective Thinking in Journal Non-Users Group

Levels of Reflective Thinking	Example Quote
No Evidence of Reflection	Student 41: "Today's course aimed at highlighting some of the premises of CLT and the focus was on the principal tenet which is meaningful learning. Thus, communicative competence is the desired goal which can be achieved only through fluency-oriented tasks and authentic use of language situations akin to real life ones". Student 45: "The course of today was about suggestopedia language learning method. This method was developed in 1970_S by the psychotherapist Lozanov. It is also known as the positive suggestion method, deciphering where the teacher introduces new grammar and vocabulary". Student 47: "Today was a special day in the sense that we were introduced to different topics in different subjects….We started talking about definitions of stylistics and came to the conclusion that it is a branch of linguistics which focuses on the style. After that, the professor told us that this course will be in the form of presentations; thus, every one of us was assigned a topic to work on".
Evidence of Understanding	Student 51: "I learned that an abstract should contain a brief summary of the contents of a study which allows any reader to quickly induce the essential elements of a project. In addition, I gained a deep understanding of things to avoid while writing my abstract of my research paper such as avoid lengthy background, redundant phrases, and repetitive information". Student 52: "We learned that discourse analysis is all about language use in context. It looks at how language is used, how meaning is conveyed and how successful communication is achieved". Student 48: "We have learned that this method has various merits and a lot of drawbacks. So to start by its merits one can say the following: First, it develops reading and writing skills. Second, it improves translation and the teacher doesn't need to have oral skills. However, the drawbacks of this method are: Listening and speaking skills are marginalized and it affects students' motivation".

3.4 Mixed Methods Research Question

To address the mixed methods research question (MM RQ: To what extent do the qualitative findings confirm the quantitative results?), integration was done by comparing the conclusions generated from both quantitative results and qualitative findings (Creswell & Tashakkori, 2007). To this end, the integration approach employed was joint display, specifically, side-by-side comparison because it is suitable for the convergent design (Creswell & Plano Clark, 2018). Table 11 displays the integrated results matrix for the role of reflective journal writing in reflective thinking development.

Table 11

Joint Display of Quantitative, Qualitative, and mixed Methods Inferences

Constructs	QUAN Results	qual Findings	Inferences Drawn
Non-reflective	**Between groups** Pretest Cont: Mean rank= 145 Exp: Mean rank= 133 p = .101 Posttest Cont: Mean rank= 96 Exp: Mean rank= 193 p < .001 **Within groups** Cont-pre/posttest: p = .386 Exp-pre/posttest: p < .001	**Journal non-users** Pretest: 83.9% Posttest: 71.7% **Reflective journal users** Pretest: 64.1% Posttest: 15.4%	Convergent
Understanding	**Between groups** Pretest Cont: Mean rank= 159 Exp: Mean rank= 122 p < .001 Posttest Cont: Mean rank= 110 Exp: Mean rank= 159 p < .001 **Within groups** Cont-pre/posttest: p = .176 Exp-pre/posttest: p < .001	**Journal non-users** Pretest: 16.7% Posttest: 28.3% **Reflective journal users** Pretest: 35.9% Posttest: 20.5%	Divergent
Reflective	**Between groups** Pretest Cont: Mean rank= 138 Exp: Mean rank= 138 p = .970 Posttest Cont: Mean rank= 83 Exp: Mean rank= 180 p < .001 **Within groups** Cont-pre/posttest: p = .118 Exp-pre/posttest: p < .001	**Journal non-users** Pretest: 0% Posttest: 0% **Reflective journal users** Pretest: 0% Posttest: 52.6%	Convergent
Highly Reflective	**Between groups** Pretest Cont: Mean rank= 136 Exp: Mean rank= 140 p = .621 Posttest Cont: Mean rank= 90 Exp: Mean rank= 175 p < .001 **Within groups** Cont-pre/posttest: p = .080 Exp-pre/posttest: p < .001	**Journal non-users** Pretest: 0% Posttest: 0% **Reflective journal users** Pretest: 0% Posttest: 11.5%	Convergent

Note. QUANT = Quantitative, qual = qualitative. Quantitative and qualitative data were integrated to address the research problem from different perspectives, thus providing mutual confirmation of the effectiveness of reflective journal writing in improving EFL master students' reflective thinking.

Table 11 shows that both quantitative results and qualitative findings converge in non-reflection, reflection, and critical reflection; and diverge in understanding.

4. Discussion

This mixed methods study investigated the effect of reflective journal writing on the development of Moroccan EFL master students' reflective thinking. Similar to the results of previous quantitative studies (e.g., Fakude & Bruce, 2003; Farahian et al., 2020; Tsingos-Lucas et al., 2016), the quantitative results suggest that engaging students in reflective journal writing enables them to develop reflective thinking. As discussed in the literature review, reflective journal writing stimulates reflective thinking in a host of ways. First, it makes thinking explicit (Sayers, 2005) and visible. Ritchhart and Perkins (2008) assert that stimulating thinking necessitates making it visible because thinking is abstract and invisible. Second, reflective journal writing encourages students to think deeply (Beveridge, 1997; O'Connell & Dyment, 2013; Surbeck et al., 1991), enables them to engage in higher order thinking skills, and helps them to improve their metacognitive awareness (Rolheiser et al., 2000). Journaling does not only provide opportunities for learners to reflect (Joseph, 2006), but also it allows them to practice the art of reflection essential for learning new things and achieving transformative learning (Hubbs & Brand, 2005).

As to the qualitative findings, similar evidence of reflection found in subjects' journals was reported in prior qualitative studies (e.g., Ho and Richards, 1993; Plack et al., 2005; Thorpe, 2004; Wong et al., 1995) as the majority of the written reflective accounts demonstrated evidence of reflection and few achieved critical reflection. The following inhibiting factors to reflection appear to interpret the findings of this study and could explain why only few subjects achieved critical reflection. These factors can be internal and external. The intrinsic factors include lack of motivation (Otienoh, 2009), individual differences, (Varner & Peck, 2003), and students' perception of journaling (O'Connell & Dyment, 2003). First, students lack of motivation and willingness to engage in deeper levels of reflection and also the lack of interest in writing journals can hinder this developmental process. Bain et al. (1999) posit that the willingness and desire to deploy efforts to write reflective journals is important for students to engage in deeper levels of reflection. Mastering the techniques of reflection is not enough, having dispositions such as the will and desire to apply them is required too (Dewey, 1933). They are the driving force that fuel students' perseverance and tenacity to face the challenges and difficulty of the reflective act. Second, individual differences can be a limiting factor to students' engagement in critical reflection. Reflective journal writing may not align with all students' learning style, hence not fulfilling the needs of all of them. Therefore, it can constitute a limiting factor to the ones who go for other forms of reflection (Greiman & Covington, 2007). Last, the way students perceive both journaling activity and the reflective process can be a barrier to achieve higher order reflection. For example, reflective journal writing in itself can be viewed as a daunting task (Kok & Chabeli, 2002), a time and effort consuming activity, and a burden instead of a means by which students can improve their critical reflection and boost their reflective reasoning. Additionally, some students may underestimate the value of journaling activity. It can be considered as a simple dairy, hence impacting the depth and quality of reflection (O'Connell & Dyment, 2013). The personal nature of journaling is another parameter explaining this difficulty to write reflectively. The majority of students find writing reflective journals challenging as they are not used to write in the first person since it is more personal unlike academic writing which is impersonal (Pavlovich, 2007). Kember, Leung, et al. (2006) note that formal education necessitates academic writing which is the antithesis of reflective writing as it is impersonal, and that is why many students find difficulties to engage in personal reflections. Therefore, this may hinder their engagement in higher order reflection.

The extrinsic factors that may impede students' engagement in an advanced reflective reasoning, include the learning situation (Lethbridge et al., 2013) and not grading journals. First, students' learning situation can be a barrier to their involvement in different levels of reflective thinking (Lethbridge et al., 2013). The learning situation can be either thought-provoking triggering students' intellect, encouraging productive and active thinking, and making them use higher order cognitive processes or the opposite make their thinking passive and reproductive. In this case, their reflections are mainly superficial centered on recalling and restating information instead of questioning and delving deeper into things using advanced cognitive reasoning. Second, not grading journals can impact the quality of students' reflection, specifically grade driven ones. In this study, students' participation in the research was voluntary and, thus, journal assignments were optional and not obligatory. They were neither graded nor attributed a percentage of an overall grade. This could be a potential limiting factor to assessment driven students' engagement in critical reflection, as journaling activity can be perceived as a waste of time and effort. Wong (2016) notes that students who are assessment driven are unlikely to develop reflective skills. Grades are a stimulus for this type of students which may trigger them to deploy efforts and time to engage in an in-depth reflection.

However, the qualitative findings of this study differ from previous research findings (e.g., Avarzamani & Farahian, 2019; Ayan & Seferoglu, 2011; Bain et al.,1999; Bell et al., 2011; Ho & Richards, 1993; and Williams et al., 2000) which reported that the students were unable to reflect at advanced levels and most of them were non-reflective. There is one possible way of interpreting this inconsistency in the findings. In this study, to help journal users delve deeper into higher levels of reflection, reflective journaling activity was scaffolded. Russell (2005) notes that engaging students in reflective practice does not guarantee the development of reflective skills. The ability to reflect has to be developed in a conscious way through coaching, modeling, and explicit instruction (Kathpalia & Heah, 2008). The researcher provided explicit instruction clarifying the concept of reflective thinking, its levels, typologies, and also the specificities of reflective writing. Moreover, reflective prompts designed based on Driscoll's reflective

model (2007) were used. Opting for the use of prompts was justified by the fact that they serve as "explicit procedural supports" (Collins et al., 1991, p. 41) or reflective strategy (Song, Grabowski, et al., 2006). These prompts decompose and break down reflective thinking into a set of steps or processes that facilitate and guide students' engagement in higher order reflection, and make this reflective thinking process explicit and visible. Furthermore, self-monitoring prompts have the potential to reduce the cognitive load on learners since they serve as a reminder of how to complete the task, allow them to make their thinking explicit and visible, model the reflecting act, and make them learn to reflect independently (Davis & Linn, 2000). However, Davis and Linn (2000) note that despite the fact that self-monitoring prompts make learners thinking explicit and visible, not all them benefit from this. As a result, students may write their journals without taking into consideration these prompts which might explain why in this study only few achieved critical reflection.

As to the divergent results of the mixed methods question concerning the understanding construct, a possible explanation for this is the approach of assessment adopted in both instruments. The coding of subjects' journals was realized using a holistic assessment approach (Jonsson et al., 2021). It is recommended to assess or code the levels of reflective thinking at the whole-paper level (Driessen et al., 2006; Kember, McKay, et al., 2008) to determine the highest level of reflective thinking exhibited. This explains the decrease of the number of journals categorized as non-reflective in the posttest, be it habitual action or understanding, because there was a significant improvement in journal users' levels of reflection and critical reflection. Whereas in journal non-users, no significant change over time was observed since there was no evidence of reflection. On the other hand, the questionnaire adopts an analytic approach of assessment (Jonsson et al., 2021) as the level of reflective thinking is measured by four scales, namely Habitual Action, Understanding, Reflection, and Critical Reflection. And, the subjects' have to indicate their level of agreement with statements about these four scales (Kember, Leung, et al., 2000). Overall, the qualitative findings confirm the quantitative results in that journal users' level of reflective thinking significantly improved through reflective journal writing compared to non-users who used traditional essays, hence providing additional empirical evidence for the effectiveness of this pedagogical means in improving EFL students reflective reasoning.

4.1 Practical implications

The results of this study hold noteworthy implications for infusing reflective writing in higher education curriculum to stimulate EFL students reflective reasoning, stoke their independent thinking, and help them move beyond simply reproducing knowledge. The flexible nature of reflective journal writing permits students to reflect during, after, and before learning activities. In other words, it provides opportunities to practice reflection-in-action, reflection-on-action (Schon, 1983, 1987), and reflection-for-action (Killion & Todnem, 1991; Wilson, 2008). For this reason, adopting a reflective learning approach enables students to make connections; engage in conscious and active learning; make meaning of their learning experiences; take their time to deeply consider things and reflect on their learning; establish learning plans; solve problems; make thoughtful, reasoned decisions regarding their learning; and become active and productive thinkers.

4.2 Limitations and recommendations

This study has the following limitations: first, the selection of the accessible population was done using a non-probabilistic sampling technique which reduces the generalizability of the results to the larger population (Fraenkel et al., 2012). Also, the research sites were selected for their convenience. Due to COVID-19 pandemic restrictions, conducting the study in other faculties was difficult. Second, the nature of this study requires the subjects to engage consistently in the writing activity. Given that all of the subjects were adult EFL learners, most of them were working and studying at the same time, which affected their participation. Despite the fact that 84 students consented to take part in the study, some were not able to stay engaged, hence reducing the sample size to 69 (N = 69). This limitation could not be controlled by the researcher. Finally, another limitation that might have affected the results of this study was the psychological state of the subjects during the intervention, including their seriousness in writing their weekly reflections. Despite the fact that the researcher constantly expressed gratitude and appreciation to the subjects, she had no control over this issue. Based on the results of this study, future research is required to explore subjects' perspectives regarding both the utility and challenges of reflective journal writing in stimulating their reflective thinking.

The current study has provided additional evidence supporting the incorporation of reflective activities into EFL curriculum to enable university learners develop reflective thinking, adopt a reflective learning approach, and ultimately become independent reflective thinkers who can effectively and creatively solve problems, make well-thought decisions, adapt to challenges and changes, and contribute to the advancement of society, which is the central goal of higher education.

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