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Self-Assessment of Critical Thinking Skills in EFL Writing Courses at the University Level: Reconsideration of the Critical Thinking Construct

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Abstract:
The Critical Thinking (CT) component has by now secured a key place within EFL curriculum aims and objectives. The integration of a CT dimension into the teaching of the writing skill in particular has received considerable attention in research. However, research has also pointed to the failure of assessment practices to evaluate CT development. It is within this context that the present work advocates a standard based approach to the assessment of CT in EFL writing that aligns assessment criteria to the critical abilities articulated in the learning outcomes (i.e., standards). This fosters a conception of CT measures that associates components of CT with higher order writing skills. Accordingly, the first objective of the study is to empirically test the relationship between CT dispositions and metacognitive strategy use in an attempt to establish a model of writing (self-)assessment that combines these two dimensions. As assessment is viewed as a formative evaluation process subservient of learning, the study also targets the students' self-assessment strategies during the writing process. To this purpose, a questionnaire has been designed, and administered to 100 students at the Faculty of Letters and Human Sciences in Rabat to tap their perceptions and use of CT skills. The data analysis revealed that critical thinking development and assessment are metacognitive in nature; it follows that metacognitive skills such as planning, self-evaluating and reflecting are to be used as an essential vehicle in the development of Critical Thinking skills. This points to the paramount role of CT-informed formative (self-)assessment practices in benefiting ELT writing learners.
***Key words**:* critical thinking skills, metacognitive skills, L2 writing, self-assessment

Introduction: Context and Purpose

Critical thinking has emerged at the forefront of higher education today (Beaumont 2010). Specifically, efforts to promote students' critical thinking skills have been fostered within the context of writing (Dixon, Cassady, Cross, and Williams 2005; Facione 1998). Dixon, et al. (2005) rightly notes that writing is a vehicle through which students can express their critical thinking. It is commonly believed that writing tasks address higher-order skills in that students' responses involve the component of interdependent competencies. Conversely, writing enables the assessment of the extent to which learners have been successful in obtaining critical skills.

However, questions regarding whether critical thinking skills in English L2 writing at the university level are being assessed have been raised. Research points out to the failure of (formative/summative) assessment practices to evaluate CT skills reliably, reflecting also a failure to use assessment as a learning tool. This gap between teaching and assessment practices of critical thinking is a focal point of new trends of assessment research (Bers, 2005; Erwin & Sebrell, 2003; Ku, 2009).

Recent approaches to CT call for adopting a set of assessment standards that are in alignment with learning outcomes for high-order thinking (Dower, 2003; Facione, 2000; Fung, 2014; GAO, 2013; Paul & Elder, 2005). That is, the standards ensure that assessment criteria meet substantively the concept of critical thinking, and provide evidence that students have successfully completed the writing assessment tasks. In this spirit, the purpose of the present work is to examine EFL university students' perceived use of writing-specific critical thinking skills. The pedagogical implication is, of course, for students to be able to critically assess their writing skills using CT criteria.The need for studying EFL students' critical thinking in writing assessment does not only emanate from the fact that these learners may lack the ability to engage in critical thinking; the concern is also with whether assessment practices focus explicitly on criteria of critical thinking skills. Another concern is the renewed interest in metacognitive strategies in L2 writing research. In fact, there have been several studies that aimed at examining the role of metacognitive strategies in critical thinking and their use by students (Ku and Ho 2010; Magno 2010). However, most of these studies stress teaching practices that develop such skills and pay little attention to assessment.

This study is significant for several reasons. First, to the knowledge of the researchers, there have been few previous studies in the field of EFL assessment that have attempted explicitly to connect the performance of Moroccan EFL learners with assessing writing for critical thinking skills. Hopefully, the implementation of the study would provide further insights into this issue. Second, the study provides test designers with a framework for creating critical thinking assessment instruments and learning outcome criteria. The suggested model combines critical-thinking skills and metacognitive strategies in writing and describes how these skills are operationalized in the development and assessment of writing tasks. This means being able to translate critical components into measurable behaviors that can be assessed reliably.

To address this aim, we first attempt to sketch out a construct of CT and show how it will be used in the study. Based on the theoretical review, the research questions, instrument, and design, which merge conceptions of CT skills and metacognitive strategies in a single model, are sketched out. Then, the study methodology and results are presented. Discussion will follow with

implications on formative assessment of writing. The paper makes suggestions for future research into CT assessment.

1. Review of the Literature

This section reviews the construct of CT and metacognitive strategies as components of higher order thinking skills and the implications for the teaching and assessment of L2 writing. This is meant to foreground the discussion of the proposed integrated model.

Although significant advances have been made in developing critical-thinking skills in students, not enough attention is devoted to performance assessment in post-secondary education. Writing assessment has lagged behind. The assessment of students' learning outcomes at university in terms critical thinking presents many challenges such as the issues of test validity and reliability. The argument can be made that it is only recently that we have seriously considered the relationship of assessment criteria to the other elements. The study subscribes to the trend of performance-based assessment which sets writing performance indicators in terms of measurable behavior. The assessment standards feature an increased focus on students' deeper learning, or their ability to analyze, synthesize, and explain their ideas among other higher order skills. Using outcome-based terminology, the described approach provides a set of criteria for high-order student assessments that are in alignment with learning outcomes. It follows that assessment tools should include the critical abilities articulated in the standards. Tasks should measure these abilities directly as they will be used in actual writing performance.

1.1. Critical Thinking in EFL Writing

A variety of definitions of critical thinking have been provided by theorists and educators (Facione, 1998; Kurfiss 1988; Siegel 1988) across disciplines putting a slightly different emphasis on its components. In fact, it is an umbrella term that comprises many complex processes. Four domains of critical thinking have been identified, namely elements of thought, abilities, affective dimensions, and intellectual standards (Benjamin, Klein, Steedle, Zahner, Scott & Patterson 2013). Due to the large number of definitions of critical thinking, a defensible conception of CT it is worth considering. The concern is what really counts as critical thinking in academic writing settings where undergraduate students have to produce written essays.

Despite variation in definitions of critical thinking, there is significant agreement on its core cognitive process components. Facione (1998) identifies six skills essential to CT:

1) *Interpretation*: the ability to understand and express the meaning associated with information, experiences, and beliefs.
2) *Analysis*: the ability to identify relationships, intended and inferential, among representations of information, experiences, and beliefs.
3) *Evaluation*: the ability to assess the credibility of representations of a person's perceptions or beliefs, and to assess the strength of the relationships on which those representations are based.
4) *Inference*: the ability to identify and utilize relevant portions of representations in order to draw reasonable conclusions, or form hypotheses or conjectures.
5) *Explanation*: the ability to state and justify one's reasoning.
6) *Self-regulation*: the ability to evaluate one's own process of reasoning, utilizing analysis skills, and through questioning, correcting and validating one's results.

While these skills are not specifically linked to writing, and seem to draw from conceptions about critical thinking as a generic construct that cuts across various disciplines, they are useful representations of higher thinking processes and information processing. The way the processes are sequenced supports the student skills development by gradually increasing the challenge of what language and critical thinking skills these students use. However, in this study no hierarchy is intended. Moreover, this conception of CT seems to draw on elaborated versions of Bloom's Taxonomy of levels of learning, while it implicitly alludes to other higher levels such as the ability to synthesize knowledge. Likewise, 'knowing' and 'applying' are excluded from the list assuming these learning processes lend themselves to cognitive rather than higher order thinking. However, the meaning of "knowing" has changed from being able to recall information to being able to find and use information including learning strategies needed to acquire the knowledge to think productively. Finally, while the Cognitive Process Dimension is outlined, the Knowledge Dimension of learning which identifies four types of knowledge: factual, conceptual, procedural, and metacognitive (Anderson & Krathwohl, 2001; as cited in Beaumont 2010) is not explicitly stressed in Facione's definition (1998).

1.2. Metacognitive Skills and Writing

Critical thinking, like metacognition, is considered as higher order thinking (Halpern, 1993). The present study argues for the benefits of using *metacognition* as an essential tool in the acquisition and development of higher-order thinking skills. In an earlier study, Facione (1990, p. 3) defined critical thinking as: "*purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based.*" Self-regulation, according to Zimmerman (1986), focuses on how students personally activate, alter, and sustain their learning skills in specific context. Lenski (1998) notes that self-regulation is shown in the evaluation and revision where the writer judges what he/she thought about and correcting the inadequacy in the work. A broader definition of regulatory skills has been described by Jacobs and Paris (1987) where three basic skills are considered as important: planning, monitoring, and evaluation. Therefore, in Facione's statement (1998) 'purposeful, self-regulatory judgment', metacognition stands out as an important characteristic of critical thinking.

More interestingly, the definition establishes a relationship between critical thinking skills and metacognitive strategy use, and distinguishes these two levels of higher order thinking. This relationship is further specified by the term 'results in', which may be interpreted as causal, sequential, or process/product in nature. Whatever the relationship is, critical thinking undoubtedly requires that higher level of metacognitive skills as in processing information. Student writers need to do specific metacognitive skills such as monitoring thinking process and checking whether progress is being made toward an appropriate goal.

Halpern (1998), reported in Sadeghi, Hassani and Rahmatkhah (2014), represented metacognition and critical thinking together in a model. She stated that metacognition is the ability to use knowledge to direct and improve thinking skills. A stronger view of the relationship between the two components is expressed by Magno (2010) who explains that critical thinking is a product of metacognition which provides a direction in the prediction of the two variables. It seems that metacognitive strategies enable control that is in charge of learners' thinking processes.

According to Ku and Ho (2010), metacognitive strategies used in critical thinking fall under three categories: planning, monitoring, and evaluating. In this sense, they are comparable to regulatory skills described earlier by Jacobs and Paris (1987). To begin with, planning involves the selection of a strategy or plan of action to achieve a goal. Planning activities include those aiming at the determination of procedures that direct thinking, the selection of appropriate strategies, and the allocation of available resources (Sadeghi et al., 2014). Monitoring activities refer to an awareness of task information and checking this to validate comprehension and to devote attention to important ideas (Schraw, 1998). They also include assessing progress and judging the likelihood of success. As for evaluating strategies, they refer to monitoring the progress made toward achieving a goal. They involve the examination and correction of one's cognitive processes (Facione, 1990) including evaluating one's reasoning and conclusions (Schraw, 1998).

It is worth stressing the role of reflection as an essential critical skill. Critical Thinking, according to Ruggiero (1989), refers to the reflective thinking. Indeed, in order for students to be able to monitor, assess, and improve their own performances and their own thinking, they need to self-reflect regularly. Metacognitive reflection allows students to manage and assess their own thinking strategies.

To conclude, for the purposes of this study, critical thinking is used to involve six skills essential to effective communication in writing, namely knowing, interpreting, applying, analyzing, synthesizing, and evaluating. Besides, there is an apparent connection between metacognition and critical thinking in that critical thinking skills are facilitated through metacognition. In other words, critical thinking in writing occurs when students use their metacognitive skills (i.e., planning, monitoring, and evaluating). Therefore, a main objective of the study is to measure the extent to which both aspects correlate in students' writing performance.

2. The study

2.1. Context and Population

The study took place at the Faculty of Letters and Human Sciences in Rabat. The choice is a matter of convenience as one of the researchers is well acquainted with the faculty and can have access to the students. Convenience was also the criterion for choosing the groups of students. Data were collected in the Spring Semester of the 2015- 2016 Academic Year. 113 semester four students majoring in English Studies and belonging to two groups participated in the study. The choice of semester 4 was motivated by the fact that students at this level have acquired enough language competence which would allow them to complete the questionnaire items without being distracted by comprehension problems. Further, since they had taken three writing courses, a reasonable amount of focused writing practice was guaranteed; this was meant to help them anchor their responses to the questionnaire statements on real-life writing experience, rather depend entirely on hypothetical assumptions about "what they would do if they wrote". This would increase the validity of the study design.

2.2. Research Questions and Hypotheses

The study set out to investigate the relationship between critical thinking predispositions and metacognitive strategy use and the extent to which university students show awareness and make use of these in self-assessment of their writing performance. Hence, in line with the brief literature review spelled out above, three main research questions were formulated:

1) To what extent does students' perceived use of critical thinking skills correlate with that of metacognitive strategies?
2) To what extent do students show evidence of higher order thinking skills in their writing process?
3) What areas of the learners' higher order thinking skills predict weaknesses and strengths in CT skills?

Based on the raised questions the following hypotheses were suggested:

1) Based on the interpretation of previous research, it is expected that critical thinking would be associated positively with metacognition (see Elaldi and Semerci 2014 for example). There is a significant positive relationship between the participants' use of critical thinking and metacognitive strategies.
2) The students are expected to exhibit low critical thinking awareness and regulation of self-assessment skills.
3) An assumption is made that EFL university students do not tend to plan and evaluate their writing performance in general. Therefore, it is expected that planning and self-evaluating skills are not candidate predictors of these students' high performance in writing.

2.3.The Research Instrument

To collect the data, a questionnaire of 66 items divided into five subscales, and rated on a 5-point likert scale of agreement and frequency of use was designed. Items fall into one of three dimensions of student learning: knowledge and understanding; proficiencies and practices; and attitudes and dispositions. The items were developed based on an analysis of various well-established taxonomies of metacognitive strategies and critical thinking skills while narrowing their scope to the specific domain of writing. The items were meant to tap the learners' perceptions of how they proceed during the writing process; thus, the statements reflect the different stages, brainstorming, drafting, and revising. In addition, two sets of statements target general experience of writing (person knowledge and affective dispositions). By the same token, the items were formulated using verbs that draw from Bloom's taxonomy commonly used to assess CT skills and dispositions.

2.4. Research Design and Variables

To answer the research questions, the researchers opted for an ex-post facto design based on a questionnaire. This research used a simple and multiple correlational methods.The design of the study has resulted in a model that can be used for assessing higher order thinking competence in EFL writing at the university level. The questionnaire items show how we can combine CT and Metacognition Skills together to formulate assessment criteria.

Table 1: ***A model for Formative Assessment***

			Critical Thinking Skills						
			Knowing	**Applying**	**Interpreting**	**Analyzing**	**Synthesizing**	**Evaluating**	**Affective Disposition**
Metacognitive Strategies	**Planning**	**Intrinsic goal setting**							
		Goal-orientation							
		Planning							
	Self-regulating	**Organizing**							
		Monitoring progress							
		Completing Communicative Task							
	Editing / Self-evaluating	**Reflecting**							
		Feedback/ revising							

The model consists of a (7*8) matrix of variables clustered under the two sets of variables Critical Thinking skills and dispositions (CTSD) and metacognitive strategies (METAS). Choice of the variables was based on synthesizing available literature related of the field. It is worth mentioning that the study results are not concerned with reporting a detailed analysis about each of the variables, as doing so may not yield reliable results given the limited number of items covered by each variable separately. Discerning the different CT components, it is believed, is not likely to yield further insights in practical terms (see the review of the literature). Accordingly, the model is reduced to (1*3) matrix: [(CTSD)*(planning + self-regulating + self evaluating)]

2.5. Presentation of the Results

The participants were asked to complete the questionnaire in their regular classes which took in about 40 minutes. In total, 113 questionnaires were filled out, but only 100 were used as 13 turned out to be half-filled and were disregarded. The data were processed in the SPSS program

and three main statistics were used, namely, descriptive, correlations, and regression, to answer the research questions. The following is a description of the results.

As a preliminary step in the analysis, a correlation was run between critical thinking dispositions and metacognitive skills. This was motivated by an interest in establishing statistically the link between the two as part of the validation of the proposed model, which is in turn based on the recent literature in the field as discussed above. The results of the correlation are displayed in the following table.

Table 2: ***Correlations between the General Means of Critical Thinking and Metacognitive Strategies***

Pearson two-tailed Correlations		
	Critical Thinking	Metacognitive Strategy Use
Critical Thinking	1	,958**
Metacognitive Strategy Use	,958**	1

****r < 0.01**

The correlation coefficient between critical thinking skills and dispositions (CTSD) and metacognitive strategy (METAS) use is over 0.95. It proves to be significant, and indicates a high association of the correlated variables. This lends strong support to the proposed model and the literature on the topic. Specifically, the results of this research confirm that metacognitive skills have a big influence on the critical thinking skills.

Practically, efforts to promote either components of higher order thinking may be accessed through reinforcing the other. This particularly applies to CT which may be seen as an end process to metacognition. This means that the increase in students' ability of self-assessing their critical thinking skills can be influenced by enhancing their metacognitive skills in writing.

Having established an association between CTSD and METAS use, it is worth investigating how these two variables combine to represent the bulk of learners' high order thinking skills (HOT).

Table 3: ***Descriptive Statistics of Overall Achievement on CTSD and HOT Use***

Variables	N	Min	Max	Mean	SD
CTSD	100	2,31	3,88	3,28	.34
HOT	100	2,26	3,76	3,22	.29

In terms of overall performance of the students in strategy awareness and frequency of use in L2 writing on a scale of 1 to 5, the results pinpointed a CTSD mean of 3.28 as is displayed in table 3 above; this is a relatively high mean if compared to HOT mean. The CTSD and HOT values are considered high in view of fact that critical thinking skills are not addressed directly in the L2 writing curriculum or any other language related subject, and they are usually left to their own in the acquisition process.

The relatively high mean may rather be attributed to the desirability effect of participants producing positive responses about their skills. Besides, the value of standard deviation (SD= .34) points to a significant variability within the sample, which makes any generalizations about the participants' level of CTSD inconclusive. Therefore, advancing investigation further with more detailed analysis was compelling.

A more specific analysis focuses on the three types of metacognitive strategies, namely planning, regulating, and self-evaluating. The results are quite revealing as is clear in the table below.

Table 4: ***Descriptives of METAS Awareness and Use***

	N	Min.	Max.	Mean	SD
Planning	100	2,19	3,11	3,11	0,38
Regulating	100	2,31	3,84	3,67	0,3
Self-Evaluating	100	2,07	3,55	2,85	0,32

With a mean of 3,67, students in the study scored the highest on self-regulating skills. Accordingly, the students seem to be more aware of the regulating strategies and they use them quite often; these include organizing, monitoring, and completing the communicative task. Planning strategies (including goal setting, orientation) came at a second place with a mean of 3,11. Evaluating strategies ranked third as the least used strategies with a mean of 2,85. This suggests that students are weaker at self-assessing than monitoring their writing process. This observation hints to the relatively difficult or less frequent access of self-evaluating or planning skills by students (see Discussion below).

In attempt to investigate the differential interaction between CTSD and metacognitive strategies, a regression analysis was conducted. The specific aim is to investigate which set of higher order strategies is a good predictor of performance in tasks requiring critical thinking skills. The table below summarizes the results.

Table 5: ***Regression analysis of metacognitive Strategies and CTSD***

Variables	Regression Coeff Beta (β)	R^2	Correlation Coeff (r)	R
Planning	0,35	0,96	0,72**	.98
Regulating	0,60		0,85**	
Self-Evaluating	0,12		0,46**	

($p < 0.01$)

The multiple correlation coefficient (R= .98), which indicates the linear correlation between the observed and model-predicted values of the dependent variable (CTSD) mean, indicates a strong association of this variable with metacognitive variables (planning, regulating, and self-evaluating). In the same way, the squared value of the multiple correlation coefficient R^2 = 0.96 indicates that this model explains the 96% of variance in CT. This shows that the variation in CT is almost entirely explained by the model (the value is approximating 1). Simply

put, the regression model chosen is viewed as suitable. This lends support to the claim made earlier about integrating the two sets of variables (CTSD and METAS) in the suggested model.

The regression coefficients (β) are computed to compare the contribution of each predictor variable (planning, regulating, and self-evaluating) to CTSD, and to assess the strength of the relationship between each predictor variable to the dependent (criterion) variable. In other words, the beta value is a measure of how strongly each predictor variable influences the criterion variable.

Overall, there is a positive contribution of metacognitive skills on the Critical thinking with a significant P value at the significance level of $p < 0.01$; the regression coefficients show varying degrees of correlations between CT skills (dependant) and the independent variables of metacognitive strategies (Planning, Regulating, and self-Evaluating). According to the standardized regression coefficients (β), the relative order of importance of interpreting variables was as follows: The lowest correlation coefficient is noted with self-evaluating strategies ($\beta = 0.12$). This means that the association between the overall CT mean (performance) as affected by awareness and use of evaluation strategies is the least remarkable and consequential for the CT level. In other words, low evaluation skills affect negatively the students' thinking processes. Ultimately, evaluation strategies may be viewed as the least predictors of these students' high performance compared to the others.

The opposite may be said about Regulating strategies which show the strongest relationship with overall thinking skills with a correlation coefficient value of $\beta = .60$. About 60% of students' overall CT skills may be accounted for by frequent use of Regulating strategies. Therefore, appropriate use of these metacognitive strategies is a good indicator of high performance in higher order thinking skills in writing. To a lesser degree, the same observations can be made about Planning strategies ($\beta = .35$).

3. Discussion and Implications:

3.1. Relationship between CT and Metacognitive Writing Processes/Strategies

The starting point for this piece of research was the postulation of a new model of higher order thinking strategies adapted for the assessment of EFL writing. Previous studies of te relationship between CT and metacognition used separate questionnaires (instruments). The present study framework, however, made use of two dimensions of higher order thinking, namely, critical thinking skills and dispositions and metacognitive strategies; the two dimensions were built into a unified model forming the basis of descriptors of performance in EFL writing. The model was tested to see the extent of its validity with students who have studied L2 writing for some time through the questionnaire.

The results point to a significant and strong positive relationship between the attributes of critical thinking and metacognition. The two variables are both associated with higher order thinking. More than that, findings reveal a positive correlation of critical thinking skills in terms of metacognition. Elaldi and Semerci (2014) studied the connection between critical thinking and metacognitive beliefs and found similar tendencies in learners' responses. The findings also accord with Mall-Amiri, and Ahmadi's study (2014) which revealed a close connection between

metacognition and critical thinking. They concluded that critical thinking requires higher level of cognitive skills in processing information such as metacognition.

It may be advanced that critical thinking occurs when students use their metacognitive skills. The immediate implication is that metacognitive skills empower students' critical thinking skills in the self-assessment of their writing process. The question that remains is what metacognitive skills need to be stressed in developing and assessing students' CT skills in writing. One aspect of metacognition that is neglected in assessment practices is self-reflection. Halpern (1993) maintains that metacognition is related to critical thinking through its self-reflecting aspect. It is worth reminding that higher order thinking processes, including but not limited to reflection, enable the evaluation of the outcomes of the thinking (writing) process. However, as it will be shown in the next section, the study findings do not seem to show that students use self-reflecting skills.

3.2. Students Exhibited Low Levels of Critical Thinking Awareness and Evaluation

An observation has been made with regard to the relatively less frequent (automated) access of self-evaluating and planning skills by students. One explanation is that self-evaluation may be considered to be related to subject-specific skills. This interpretation draws on the question of whether critical thinking skills pertain to general domains of learning, i.e., broadly applicable skills which can be transferred to other contexts, or they are subject specific (McCormick, Dimmit, & Sullivan, 2010). It is generally accepted, however, that these abilities are dependent on a particular subject, and are not possible to be transferred from/to other subjects. For example, the ability of students to critically evaluate arguments and evidence appropriate to their writing purpose, and revise these accordingly are skills exclusive to writing (Crebert, Patrick, Cragnolini, Smith, Worsfold, & Webb, 2011). In this light, the participants may be facing a novel task; they may not be familiar with the context specific to writing in order for them to implement the strategies, and thus they have difficulty retrieving the self-evaluative and planning skills from general domains of learning experiences. Higher-Order Cognitive Skills allow students to transfer their learning to new situations and problems. (Darling-Hammond, et al. 2013).

Besides, these skills involve students in thinking reflectively, such as being able to evaluate the outcomes of the thinking process, or the ability to reflect on their own learning process. Such skills stand at the highest stratum in Bloom's taxonomy of levels of learning; thus they are delayed stages in the development of CT propensities. According to Lynch, Wolcott, and Huber (2002), the last stage of critical thinking acquisition is labeled the "strategic revisioner." In the same vein, Lipman (1991) claims that one's metacognition must be "self-correcting' in order to qualify it as critical thinking.

The study findings are concomitant with the idea that better critical thinkers use metacognitive learning strategies more frequently. Fahim and Dorrimanesh (2015) found that the level of critical thinking and the frequency of using metacognitive learning strategies are significantly related. The researcher interpreted the results by stating that the higher the level of critical thinking one possesses, the more often that person uses metacognitive learning strategies and therefore enjoys a higher level of autonomy in learning. Students' level of Critical Thinking and their use of Metacognitive Learning Strategies may be used as an indicator of students' level of autonomy in assessing writing skills, i.e. self-assessment. Then students need to be able to

assess their planning, monitoring and evaluating writing skills to be proficient critical thinkers and strategy users.

One important dimension of learner autonomy that has a bearing on self-evaluation is self-reflection. Desautel (2009) identified a number of self-reflective processes such as goal setting and tracking, planning to meet goals, and recognizing and evaluating achievement. He adds that just as self-reflection may serve the goal of metacognitive knowledge, self-assessment may facilitate the project of self-reflection. Desautel also quoted Carr (2002) who wrote: "when students self-evaluate, they step back and reflect on what and how they learn" (2002, p. 195). Linking Desautel's ideas (2009) to the present study results, it may be suggested that the students scored low in self-evaluation and planning (self-reflection) due to insufficient involvement in self-assessment of writing. Such practices would encourage students to attend to these processes within their tasks (formative assessment).

If our concern is to be able to assess the extent to which Moroccan EFL learners have been successful in developing critical skills, we need to introduce adequate practices such as self-assessment that embody the components of self-reflection and goal planning among other writing regulatory skills.

3.3. Regulation Skills Positively Affects the Students' Thinking Skills

So far, the role of metacognitive strategies (self-reflection skills) in critical thinking and their use by students in assessment has been emphasized. This section is devoted to examining the predictors of critical thinking in writing assessment.

A linear regression was conducted to investigate which independent variable(s) (planning, regulating, or self-evaluating) predict(s) most and/or least the dependent variable (reflected as the CTSD mean). The results showed a highly significant correlation between all the variables. The highest positive correlation was found between CTSD and regulating strategies which came out as the strongest predictor of CT achievement. These results echo earlier studies. Ingle (2007), for example, report that metacognitive self-regulatory strategies, which were defined as the "awareness, knowledge and control of cognition" by the researchers, were significantly positive predictors of the critical thinking abilities.

The implications are at least three-fold. To begin with, the finding sheds more light on the type of metacognitive strategies that enhance critical thinking. Indeed, 'good' critical thinkers are engaged more in metacognitive regulating activities, while low achievers fail to think over their own learning behaviors in order to monitor and regulate their cognitive learning. The latter point, in particular, is further supported by some researchers who claim that 'good' critical thinkers are also engaged in high-level planning and high-level evaluating strategies (Ku & Ho, 2010; Magno, 2010).

A related point is the contribution of metacognitive strategies to critical thinking. Regression analysis coefficients suggest that the dependent variable will increase or decrease by the number of standardized beta coefficients for every one unit increase in the predictor. For the present study, if students' performance on regulation strategies increases by one unit, overall performance on CTSD will develop by 0.6 point. In practical terms, regression coefficients

represent the change in the criterion variable associated with a change of one in the predictor variable when all other predictor variables are held constant. This suggests that attempts to improve critical thinking are predicted on the basis of operating on metacognitive skills.

Accordingly, we can predict improvement in students' performance on assessment tasks following formative feedback in one of the metacognitive strategies.

Finally, specifying areas of intervention to foster critical thinking via metacognitive skills draws our attention towards student-centered approaches to assessment that calls for diagnostic feedback to the student about how they can improve their performance. Giving constructive feedback entails translating the critical components (predictors of high performance) into measurable behaviors that can be assessed reliably. Assessment criteria, in turn, need to be aligned to the critical abilities articulated in the feedback standards.

Conclusion

In the light of the incrementing evidence in favor of self-assessment as major learning practice L2 student-writers can make use of towards the development of their critical thinking, the present study came to provide further support in this direction. The major thrust is that specific strategies that promote critical thinking development and assessment are metacognitive in nature. Therefore, metacognitive skills such as planning, self-evaluating and reflecting are to be used as an essential vehicle in the development of Critical Thinking skills. While the present study results turned to be very revealing, the research area is still fertile. The results in fact point to various directions derived mainly from the limitations of the study. First, future studies might seek to evaluate the predictive power of the aforementioned components longitudinally in order to determine assessment criteria and standards appropriate for different academic levels. Second, the present study was limited in scope in that it focused on students' perspectives. In this regard, teacher-centered studies are needed to understand how CT skills are assessed, and whether such practices are informed by recent development in performance assessment.

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References

Benjamin, R., Klein, S., Steedle, J., Zahner, D., Scott, E. & Patterson, J. (2013). The Case for Critical Thinking Skills and Performance Assessment. Council for Aid to Education.

Bers, T. (2005). Assessing Critical Thinking in Community Colleges. *New Directions For Community Colleges, 130,* 15-25.

Carr, S. C. (2002). Self-evaluation: Involving Students in their own Learning. *Reading and Writing Quarterly, 18,* 195–199.

Crebert, G., Patrick, C.-J., Cragnolini, V., Smith, C., Worsfold, K., & Webb, F. (2011). *Critical Evaluation Skills Toolkit.* Retrieved from the World Wide Web on April 4th, 2011, from: http://www.griffith.edu.au/gihe/resources-support/graduate-attributes

Darling-Hammond, L., Herman, J., Pellegrino, J., et al. (2013). *Criteria for High-quality Assessment*. Stanford, CA: Stanford Center for Opportunity Policy in Education.

Desautel, D. (2009). Becoming a Thinking Thinker: Metacognition, Self-Reflection, and Classroom Practice. *Teachers College Record 111 (8):* 1997–2020.

Dower, N. (2003). An Introduction to Global Citizenship. Edinburgh: Edinburgh University Press.

Elaldi, Ş., & Semerci, Ç. (2014). The Roles of Metacognitive Beliefs in Developing Critical Thinking Skills. *Journal of Faculty of Education, 3 (2),* 317 – 333.

Erwin, T. D., & Sebrell, K. W. (2003). Assessment of Critical Thinking: ETS's Tasks in Critical Thinking." *Journal of General Education*, *52*(1), 50–70.

Facione, P. (1998). *Critical Thinking: What It is and Why It Counts.* Retrieved September 6th, 2015, from http://www.insightassessment.com/pdf_files/what&why2006.pdf.

Facione, P. A. (2000). CCTDI Rest Manual (pp. 4-9). California: California Academic Press.

Facione, P. (2007). Critical Thinking: What It is and Why It Counts. In *Insight Assessment*. Millbrae, CA: California Academic Press.

Fahim, M. and Dorrimanesh, P. (2015). Do Better Critical Thinkers Use Metacognitive Learning Strategies More Frequently? *International Journal of English Language, Literature and Humanities 3(4),* 800-818.

Fung, D. (2014). Promoting Critical Thinking through Effective Group Work. Educational Research, 66, 45-62. GAO, Z. Y. (2013). The Current Investigation on Applied Undergraduates' Critical Thinking Deposition. Higher Education Exploration, 2, 129-133.

Halpern, D. F. (1998). Teaching Critical Thinking for Transfer Across Domains: Disposition, Skills, Structure Training, and Metacognitive Monitoring. *American Psychologist, 53*, 449–455.

Halpern, D.F. (1993). *Thought and Knowledge: An Introduction to Critical Thinking*. Hillsdale, NJ: Erlbaum Associates Publishers.

Ingle, C. O. (2007). *Predictors of Critical Thinking Ability Among College Students.* Doctoral dissertation, College of Education, University of Kentucky, the U.S.A. Available from ProQuest Dissertations and Thesis database. (Publication No. AAT 3263681).

Ku, K. Y. (2009). Assessing Students' Critical Thinking Performance: Urging for Measurements Using Multi-Response Format. *Thinking Skills and Creativity*, 4(1), 70-76.

Ku, K.Y. & Ho, I.T. (2010). Metacognitive Strategies that Enhance Critical Thinking. *Metacognition and Learning 5 (3)*, 251-267.

Kurfiss, J. G. (1988). *Critical Thinking: Theory, Research, Practice, and Possibilities.* ASHE-ERIC Higher Education Report no. 2. College Station, Tex.: Association for the Study of Higher Education.

Lenski, S. D. (1998). Strategic Knowledge When Reading in Order to Write. *Reading Psychology, 19*, 287-315.

Lipman, M. (1991). *Thinking in Education*. Cambridge: Cambridge University Press.

Lynch, C. L., Wolcott, S. K., & Huber, G. E. (2002). Steps for better thinking: A developmental problem solving process. Retrieved September 6th, 2015, from: http://www.WolcottLynch.com.

Magno, C. (2009). Self-Regulation and Approaches to Learning in English Composition. *Writing TESOL Journal 1*, 1-16.

Magno, C. (2010). The Role of Metacognitive Skills in Developing Critical Thinking. *Metacognition and Learning 5*, 137–156.

Mall-Amiri, B. and Ahmadi, Z. (2014). The Relationship between EFL Learners' Critical Thinking, and Metacognitive Strategies. *International Journal of Language Learning and Applied Linguistics World (IJLLALW), 5 (1),* 488-505.

McCormick, C. B., Dimmitt, C. & Sullivan, F.R. (2012). Metacognition, Learning, and Instruction. *In W. M. Reynolds & G. E. Miller (Eds.), Handbook of Educational Psychology (2nd Ed., pp. 69-98).* New York: Wiley.

Paul, R. & Elder, L., (2005). A Guide for Educators to Critical Thinking Competency and Standards: Standards, Principles, Performance Indicators, And Outcomes With Critical Thinking. Foundation for Critical Thinking. Retrieved 30th December from: www.criticalthinking.org.

Schraw, G. (1998). Promoting General Metacognitive Awareness. *Instructional Science, 26*, 113-125.

Zimmerman, B. J. (1986). Development of Self-Regulated Learning: Which are the Key Sub-processes? *Contemporary Educational Psychology, 16*, 307-313.