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MOROCCAN MIDDLE-SCHOOL, SECONDARY AND TERTIARY EFL TEACHING STAFF PERCEPTIONS AND INSTRUCTION OF CRITICAL THINKING

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Abstract:
Teaching critical thinking skills is far from being an easy undertaking. Educators take it for granted that their knowledge of critical thinking makes them ready for critical thinking instruction. Within this framework, this study investigates the Moroccan educators' perceptions of critical thinking basics together with their perceptions of critical thinking instruction. To do so, 90 English as foreign language (EFL) teachers and lecturers belonging to middle- and high-school and higher education filled in a questionnaire that was adopted in previous studies (Stedman and Adams, 2012). Findings show that regardless of the level being taught, the respondents replied to the questions related to their perceptions of critical thinking concepts with moderate consistency and accuracy. Similarly, many of their reactions to critical thinking instruction show they need more confidence to teach it.

Keywords: critical thinking, knowledge, instruction, Morocco

1. Introduction

Since the turn of the 21st Century, the need for teaching for thought has been increasingly growing. The 21st century skills target this area in many of its components. With the proliferation of digital contents in its various facets, critical thinking is needed to sift through the abundant amount of information available on the net (Halpern, 2014 and Wegerif, 2015). Furthermore, Frey and Osborne (2013) predicted that the next following two decades would see a decrease in the demand for blue-collar jobs due to automation,

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and that only jobs involving manipulative tasks and higher cognitive skills would remain safe from this change. Therefore, calls for the teaching of thinking are getting louder. These calls start from the premise claiming that even though some argue that thinking is a human attribute, human beings are unlikely to develop their ability to think reasonably without being taught to do so. In this regard, Novella (2012) suggests logical flaws and cognitive biases plague human thinking, and that the best remedy is to raise people's awareness and guide them out of the trap of these flaws. Halpern (2014) contends that critical thinking does not automatically come as a result of good education. Rather, she suggests, it needs to be nurtured purposefully and explicitly.

However, these calls might go in vain if a determining factor in the teaching process is not taken into account, the teacher. It is this latter who can put these plans into action in the classroom. This being the case, investigating the teachers' perceptions of critical thinking is of a paramount importance. Research is needed to explore to what extent teachers are aware of the importance of teaching thinking, how they conceive of critical thinking, whether or not it is worthwhile investing their resources in teaching thinking skills, or it would be more fruitful to teach knowledge. Exploring this area is very likely to shed light on the extent to which classroom conditions are in favour of teaching thinking, and what interventions are needed to improve these conditions. This paper aims to investigate Moroccan middle-school, high-school and tertiary education teachers' understanding of critical thinking concepts, and their personal perceptions of critical thinking instruction. To do so, this study tries to answer these research questions:

1) What are the middle school, high school and tertiary EFL educators' perceptions of critical thinking concepts?
2) How do the middle school, high school and tertiary EFL educators perceive critical thinking instruction?

2. Review of Literature

It is obvious that teachers' knowledge of critical thinking is crucial as they might mistakenly think that they are teaching their students how to think, while they are in fact teaching them what to think. Similarly, overlooking the knowledge of how to teach higher-level thinking might end up with teachers devising tasks involving higher-level thought to the students who are short of prerequisites for such tasks. Kurfiss (1988, p. 22) points out that "*Students are often assigned tasks that require such skills, but the problem of acquiring the requisite skills is left to the ingenuity, good fortune, and native ability of the student*".

Specifically, in Morocco, previous studies focused mainly on textbooks and skills but teachers' awareness about critical thinking tends to be overlooked. Most of those that investigated textbooks adopted Bloom's taxonomy and the critical dispositions to analyse EFL textbooks and questionnaires administered to EFL teachers and students (Jebbour, 2016; Mrah, 2017; Jebbour, 2019). The findings of textbook evaluation are divergent. Bouziane (1997) overviews previous research among which a study that evaluated the

types of comprehension questions in the Moroccan textbooks in the three languages used in the Moroccan education system (Ezzaki, 1986) and reports that the Moroccan textbooks, and exams, ask only lower-order questions. Jebbour (2016) has found that a textbook promotes critical thinking except synthesis and in another study by the same author finds analysis lacking (Jebbour, 2019) while Mrah (2017) disagrees claiming that the same textbook and its preceding level address more literal and inferencing comprehension skills than evaluation and creation. He concludes that this textbook "*series do not effectively help learners become critical thinkers*." (p. 283). Another study on a different textbook by Es-salhi and Elfatihi (2019) comes to quite the same findings and confirms that the studied textbook targets mostly the lower-thinking skills. Ait Bouzid (2016) finds that the EFL textbooks used in Morocco contain some 21st century skills, including some critical thinking skills. Jebbour (2019), who tends to praise some textbooks for catering for critical thinking, claims that "*textbook[s'] designers need to supplement textbooks of the English language with additional activities, and high school teachers of English need to implement new teaching materials and practices to help enhance students' level of CT [critical thinking]*." (p. 44). In this same vein, Elboubekri (2013) who studied critical thinking in relation with intercultural competence concludes that textbook designers should add more content conducive to teaching critical thinking within intercultural competence framework. However, he did not adequately focus on the content of textbooks.

Another series of research conducted experimental studies. Bouanani (2014) studied the university students' progress in critical skills dispositions in writing as informed by reflective writing intervention, Benjelloun and El Kirat (2019) studied the outcomes of exposing primary school learners to Bloom's taxonomy as manifested in vocabulary use, and Rouijel, Bouziane and Zohri (2019) did the same with preparatory school learners' performance in reading. All the three studies confirm that the learners in the experimental groups outperformed their peers in the control groups especially in higher-order thinking skills. In a study that analysed secondary data coming from international reports, Abdallaoui (2012) confirms the need to improve critical thinking in the Moroccan education system which lags behind other countries' systems. She claims that while national reforms encourage critical thinking, some obstacles stop this process such as the limited use of technologies, the need of better conditions for critical thinking such as academic freedom and transparency and the need for faculty professional development. Two other studies surveyed the students' and a professor's perceptions towards critical thinking. Chouari (2016) investigates students' voices (n=10) on the teaching of critical thinking as a taught course. The students report their satisfaction about both the course and the exam. However, the only study that looks into the teachers' perceptions is done by Chouari and Nachit (2016). They interviewed an experienced professor who had taught the critical thinking course for years. The findings reveal obstacles that any professor should face such as large classes, adapting materials designed for different contexts and the lack of professional development. Apart from one study which has a sample that is far from being representative (Chouari and Nachit,

2016), all the above studies took it for granted that the teaching staff are aware of the concept of critical thinking. Many of these studies call for teacher training as a recommendation for implementing critical thinking in the Moroccan education system especially in the shortage of activities in EFL textbooks. This study tries to fill this gap and thus investigates the teachers' perceptions towards critical thinking.

More importantly, what makes investigating teachers' perceptions of critical thinking more imperative is the complex nature of the concept of critical thinking itself. Pinpointing a working definition of critical thinking is a challenging task not only for educational practitioners but also for researchers. On the whole, the existing literature delineates two major approaches to the concept; a cognitive approach to critical thinking, which defines the concept in terms of sets of cognitive skills or procedures; and a dispositional approach to the concept, which argues that the attitudinal dimension should be taken into account in conceptualizing critical thinking. This being the case, even though scholars tend to agree to define critical thinking in terms of cognitive skills, there has been a debate among them about what skills should be included within the scope of the concept, and what skills should be excluded. An example to raise is the relationship between critical thinking and problem solving. Kemp (1963), in defining critical thinking tends to focus more on problem-solving, and thus claims it is a procedure that involves the ability to define a problem, to opt for requisite information to solve a problem, to identify included and excluded assumptions, to formulate hypotheses and the ability to draw valid conclusions and to evaluate conclusions for validity (p. 321). The author goes on to consider any inadequate practice of the previously described procedure as an impediment to critical thinking (p. 321). Kemp concludes that deterrents of a better performance of critical thinking are the tendency to avoid real problem solving, the implementation of a limited amount of techniques, self-complacency with partial solutions and entirely changing or evading the problem at hand. As such, the author makes problem solving inseparable from critical thinking.

However, other theorists do not subscribe to this approach. An example in this respect is Kurfiss' (1988, p. 28) contention that even though critical thinking is an instance of problem solving, a significant difference between the two concepts is that while critical thinking involves working out "*open-ended*" or "*ill-structured*" problems, problem solving has a narrower scope than critical thinking as it is mainly concerned with well-structured problems. Robert Ennis, in another respect, defines critical thinking as "*reflective and reasonable thinking that is focused on deciding what to believe or do*" (1987, p. 10). By defining it as such, Ennis excludes problem solving from critical thinking and restricts the concept into an evaluative dimension. A clearer instance in this vein is Beyer (1985), who bluntly states that "*Critical thinking is not problem solving. It is not a cover-all term for all thinking skills*" (p. 276).

Another debatable issue in this regard is the relationship between creative thinking and critical thinking. There is a tendency to separate creative thinking from critical thinking. Fisher (2002), for instance, explains that while critical thinking is analytic, as it entails analysing pre-existing ideas, creative thinking is generative, since it

generates new ideas. As such, according to this approach, critical thinking is convergent, because it is goal directed and aims to find out closed answers to the question or problem at hand. In contrast, creative thinking is divergent, as it seeks open-ended, sometimes original, answers or solutions. The author states that creative thinking formulates hypotheses and critical thinking tests them, and that critical thinking is based on logic while creative thinking on intuition. It can be inferred from this that creative thinking and critical thinking are two phases of thought that complement each other.

On the one hand, another approach conceives of creativity and criticality as two separate constructions. Glaser (1985), in this vein, argues that even though creativity supports critical thinking, this does not necessarily mean that the former is part and parcel of the latter. This attitude overlaps with that of Koestler (1975), who distinguishes between critical thinking and creativity by pointing out that ordered-disciplined thought is a skill governed by a set of rules of the game, some of which are explicitly stated, while others are implied and hidden in the code. The creative act, in so far as it depends on unconscious resources, presupposes a relaxing of the controls and a regression to modes of ideation which are indifferent to the rules of verbal logic, unperturbed by contradiction, untouched by the dogmas and taboos of so-called common sense. (p. 178). The author assumes that a great deal of the value of critical thinking is attributed to its rigor which is a missing characteristic in creative thinking. However, despite the controversies about critical and creative thought, they both remain two forms of higher-order thinking which should be nurtured in students. Fisher (2002) and Forrester (2008) agree that teaching students to think effectively entails developing their creative and critical thinking skills.

Another approach believes that defining critical thinking in terms of cognitive skills and procedures, disregarding the dispositional dimension, is missing the point. Within this framework, Bailin et al. (1999) notice that there were three widely-held misconceptions of critical thinking; some define it as one or more skills; others as mental processes; while others conceive of it as sets of procedures. The authors criticize these approaches for overlooking dispositions in the conceptualization of critical thinking. The authors believe that conceiving of thinking as general procedures is inadequate. They argue that even though heuristics can be a useful tool in learning to think critically, they are not "*central features of good thinking"* (p. 278). The authors believe that teaching students to think critically goes beyond training them to perform reasoning tasks. For them, teaching students to think critically should develop in them positive dispositions towards critical thinking in the first place. In their words, "*The educational goal must be to teach them [the learners] to do such tasks well by increasing their capacity and inclination to make judgements by reference to criteria and standards that distinguish thoughtful evaluations from sloppy ones, fruitful classification schemes from trivial ones, and so on"* (p. 279). As such, according to this approach, effective teaching of critical thinking combines teaching students to perform the required cognitive procedures correctly, as well as to develop their motivation to do so.

This attitude echoes that of Perkins et al. (2000) who believe that passions, motivations, sensitivities and values can play a role in intelligence. As such, the authors highlight the important role of dispositions in developing thinking skills side by side with actual ability to perform the cognitive procedures involved in these thinking skills. Furthermore, in their conceptualization of the construct of behavioural disposition, Perkins, Jay, and Tishman (1993) suggest that this concept is composed of three distinct components, which are ability, inclination and sensitivity. Elaborating on this conceptualization, these authors explain that ability refers to the actual capacity to perform a given behaviour, inclination concerns the motivation or readiness to engage in the behaviour, sensitivity is related to the likelihood be aware of the situation or the context which demands the behaviour.

By and large, the issue of critical thinking is complex enough to culminate into discrepancies even in the behaviours, procedures or attitudes that are supposed to be involved in critical thinking. The existing literature provides a myriad of different conceptualizations of the construct of critical thinking rather than a consistent clearly-defined concept. Therefore, Cuban (1984) describes the field of critical thinking as "*a conceptual swamp*" (p. 676). The complexity of the issue of critical thinking can be attributed to the fact that critical thinking as a field of study is not homogeneous. Morgan (1995) and Lewis and Smith (1993) noticed that the field was developed by scholars coming from different disciplines; namely philosophers and cognitive psychologists.

Given these complexities, it is assumed that in order for critical thinking to be effectively taught, more than sensitizing educational practitioners of its importance is needed. Teachers need to be well-trained enough in distinguishing between what is critical thinking and what it is not; and to select efficient instructional practices that best suit the conditions in which they work. In this context, this study comes to investigate how teachers perceive the construct of critical thinking in different levels of schooling in Morocco.

3. Method

As stated above, this paper tries to investigate Moroccan middle-school, high-school and higher education educators' understanding of basic critical thinking concepts, and their personal perceptions of critical thinking instruction. To meet these aims, a survey is used to collect data.

The sample of this study consisted of 90 Moroccan teachers belonging to three educational levels; 12 teachers of English in the middle-school, 44 teachers of English in high school and 34 tertiary lecturers teaching English in different departments in schools and faculties throughout Morocco. There was a hope that other teachers would complete the questionnaire online to consider the taught disciplines as a variable but only five teachers teaching French (2), Arabic, Maths and computer science filled in the questionnaire. Their data was removed.

The questionnaire used for data collection consists of three main parts. The first part contains a critical thinking basic skills test (Elder et al. as cited in Stedman & Adams, 2012), perceptions of critical thinking instruction questionnaire (Choy and Cheah, 2009 as cited in Stedman & Adams, 2012), and a short demographic part containing the subject and the level taught by the respondent. Data was collected on the basis of self-administered Google form dispatched via email, WhatsApp and Facebook teacher groups. The respondents provided their responses anonymously online following ethical consent instructions. It is worth mentioning that this study duplicates a previous study by Stedman & Adams (2012). However, the second part of the questionnaire, containing open-ended questions (Choy and Cheah, 2009, p. 200) was omitted for two reasons; first, to shorten the questionnaire and second, in the piloting stage of the Arabic version of the questionnaire, the two authors already noticed variations among the respondents and thus deemed that the findings would be revealing by using the first part of the questionnaire only.

The collected data was processed in SPSS to calculate the percentages of the answers and then draw conclusions. Similarly, the same software programme was used to calculate the chi-square to check whether the differences across levels were significant to suggest which teaching staff need further training in critical thinking knowledge or in its instruction.

4. Findings

The first research question aims to investigate the Moroccan teaching staff's perceptions of critical thinking concepts. The first section of the questionnaire (Table1) tries to reach this aim. The results demonstrate that there is no consensus over all the questions in the first section by the entire participants. However, there have been noticeable patterns in the respondents' answers. There are strong agreements and accurate answers about some questions. These questions are the decline of critical thinking being an exclusive Western practice. Similarly, the respondents agreed on critical thinking being a source of deep thinking, of clarifying ambiguous statements, and of reading well. They show moderate agreement on subjectivity of standards when assessing thinking and the learning of ignoring emotions at the time of important decision making. However, they show weak to very weak agreement on the remaining questions. In fact, some questions divide respondents into even percentages of 50% on either answer such as development of critical thinking among students with growing up, critical thinking being self-disciplined, not showing sympathy while analysing disgusting and ill-founded points, and the confusion between conclusions and implications.

The answers to the first research question indicate that the Moroccan teachers in different levels of schooling partially share the same perceptions of critical thinking. However, they tend to disagree on a number of questions and thus their understanding diverges. More surprisingly is their weak agreement and inaccuracy on questions that underlie that critical thinking develops with age or is not self-disciplined. Such

divergences, among others, may affect the teachers' representations and, by extension, their practices. In short, although it seems that the majority of participants have developed a common-sense knowledge about critical thinking and its importance in education, they tend to be less knowledgeable about the concepts that govern the discipline.

The second research question is verified in the second and the third sections of the questionnaire. The respondents take a stance towards the suggested statements by choosing four degrees of agreement ranging from *strongly agree* to *strongly disagree*. A departure from the classical Likert scale is the removal of "neutral" as an option.

The participants' responses are presented in detail in appendices B and C. Like some of the other parts, despite their belonging to different educational levels, the participants have responded to the second and the third sections of the questionnaire with high consistency. The participants from the three levels consistently share the same perceptions of the importance of critical thinking in their classrooms. Also, they are consistent in their perceptions of how to instruct critical thinking in the classroom. One question which received the least consistency in these sections is question 3 in section II, which is about whether or not the teachers are aware when their students use critical thinking in the courses. 6.80% of the secondary teachers and 5.90% of the tertiary education teachers disagreed with this statement whereas the middle school teachers either strongly agreed or disagreed. Another instance is question 7 in section II, which is about whether or not the teachers could implement critical thinking into their courses if required. Up to 8.30% of the middle school disagreed with the statement, whereas only 4.50% of the secondary school teachers, and 5.90% of the tertiary education teachers disagreed with it. Other questions are 8 in which teachers require additional support to implement critical thinking, question 9 in Section III in which some teachers feel it is not their responsibility to promote critical thinking, and questions 12 and 14 in the same section in which teachers are to evaluate, respectively, whether critical thinking makes active learners and whether it enables their students to understand better their course topics. Other evidence to the teachers' consistency lies in the chi-square results (see Appendix D) which show that apart from two questions, 6 and 12, in which the participants show significant difference, their perceptions tend to be consistent across the three studied levels as they all show insignificant differences among the teachers.

The answers to the second question which checks the respondents' perceptions of critical thinking instruction show more consistency in the teachers' answers. They mostly agree on 8 questions of 14. However, the questions which show less consistency are those closely related to critical thinking practices in the classroom. The respondents disagree on six key practices of critical thinking instruction. For example, they are not aware when students use critical thinking in their courses, some of them are still reluctant to implement critical thinking and others even feel it is not their responsibility to promote critical thinking. Some of them still doubt the effect of critical thinking on making students active learners who understand better academic input. Surprisingly, the need for support persists across the three levels of schooling. While teachers in the middle

school show their need for support (100%), their colleagues in secondary and tertiary levels feel more confident as the number decreases. Almost 31% of tertiary level and 7% of high school do not think they need any support. However, the remaining figures tend to be high in all levels, including tertiary level (70%). This implies that teachers at all levels need more confidence to teach critical thinking.

5. Discussion

In the first research question, the researchers aim to evaluate knowledge about critical thinking. In this regard, there are two major points to highlight. The first point is that despite the differences in their levels of education, middle-school, secondary-school and tertiary-education teachers' responses to the question were basically consistent. This finding implies that the participants received the same input, if any, of training in critical thinking. It is noteworthy that the respondents are teachers of English. and that the Moroccan *Official Guidelines* have been calling for integrating critical thinking in classroom instruction (Ministry of Education, 2007). Furthermore, being teachers of English, some of them must have benefited from the conference organised by the Moroccan Association of Teachers of English (MATE) or its published proceedings devoted to *Critical Thinking in Language Education* (Zaki, Najbi, & Chaibi, 2013). However, great efforts are needed in preparing teachers, according to their levels' needs, to address critical thinking. This outcome reinforces the findings of many researchers before (see review of literature) about teacher training, be it pre- or in-service. The role of teachers in teaching critical thinking is crucial. It was reported in the review of literature above that many of the Moroccan EFL textbooks do not contain enough content conducive to teaching critical thinking. This limitation should not be attributed to a textbook because teachers tend to be more effective in teaching it than textbooks. However, some of the teachers need more training in doing this task properly.

The second point to highlight in the teachers' responses to the first section of the questionnaire is that the majority of them tend to correctly answer the questions about the basics of critical thinking such as whether it is universal or culture-bound or whether it is necessary for learning to read. In contrast, the majority of them tend to incorrectly respond to questions about in-depth knowledge about critical thinking like the difference between conclusions and implications and interference of emotions in reasoning. Further, a stunning misconception 58.9% of the participants hold about critical thinking is that it can develop with age. Specifically, in this point, Duron, Limbach, and Waugh (2006) claim that although thinking is a natural process that needs cultivation; otherwise, it may grow biased, distorted, partial, uniformed or potentially prejudiced. They explain that "cultivation" means addressing it purposefully and explicitly. Similarly, Halpern (2014) insists that development in thinking skills cannot be a by-product of education and thus results from incidental learning which automatically develops critical-thinking skills. An alarming implication of this finding is that a significant proportion of Moroccan teachers from different levels may hold the misconception that their own critical-thinking skills

can be developed by their own age, experience in life, education or any other factor without need for any kind of training. This misconception might lead to a lack of awareness of the need for in-service training in critical thinking, which might perpetuate the negative effect of the limited pre-service training in these skills that Moroccan teachers' training centres have offered so far.

In their responses to the second and third sections of the questionnaire, the participants belonging to different levels of education have demonstrated fairly consistent perceptions of teaching critical thinking. Statistically, the chi-square measurements indicate that the three levels have not shown any significant differences beyond from two instances: barriers that persist and that critical thinking makes active learners. The distributions of the other questions in the questionnaire are even across the three levels. Based on this finding, accepting the fact that there is a relationship between the participants' level of education and their knowledge of critical or their perceptions of the teaching of critical thinking remains far from being unattainable.

The aforementioned findings explain why both national and international reports suggest that big efforts are needed to improve the teaching of critical thinking in the Moroccan school. For example, Mullis, Martin, Foy, and Hooper (2017) reveal that Moroccan students have scored largely below PIRLS Scale Centerpoint in the international distribution or reading achievement. The report states that their scores are lower than the international benchmark in such higher-order reading skills like inferencing, interpreting and integrating ideas and information, and evaluating and critiquing content and textual elements. Similarly, the Superior Council of Education and Training and Scientific Research (2016) reports that the majority of common-core students (first year of high school), from both literary and science options, suffer from a deficit in such higher-order thinking skills as analysis, synthesis and evaluation. So far, efforts to address this deficit have not yet gone beyond calling teachers through official pedagogical guidelines to integrate critical thinking in their instructional practices. However, how to define critical thinking, and how to devise critical-thinking courses, or integrate critical thinking in their subject-matter courses is left to the teachers' genuine capacities or individual efforts. As such, in most cases, teachers might unintentionally end up teaching students what to think instead of teaching them how to think.

6. Conclusion and Recommendations

Many indicators show that the learners in Morocco need a lot of training to meet the expectations of their levels of schooling. Such students are inadequately prepared for tasks in which critical thinking is required. This implies that the input they receive may not enable them to develop their critical thinking skills. Within this framework, this study checks whether the teaching staff in secondary and tertiary levels in Morocco share the same perceptions of critical thinking. It also examines the degree of the teaching staff readiness to introduce critical thinking instruction in their classrooms. The findings

indicate that although the participants have shown a moderate degree of consistency in their conceptions, some concepts still need revisiting.

The findings of this study show that the textbooks lack content that integrates high-order thinking skills and that the teachers should fill in this gap. However, the teachers have shown some inconsistencies both in the understanding of concepts and in their readiness to teach these skills. This is the role of pre- and in-service training which should address these issues seriously. Similarly, the revision of the textbooks has become a priority as they have been in use for almost two decades. The recommendations provided in the doctorates and articles cited above, and others, should be taken into account for an effective implementation of the teaching of critical thinking skills. By doing so, the level of education will improve.

The study has limitations. The sample is not balanced as to the number of participants representing each level of schooling. The sample does not include teachers of other subjects to compare the practices within and across levels. A higher number of participants could be more revealing. Future research should adopt a questionnaire with open ended questions to collect qualitative data in order to check the findings in the questionnaire. Despite these limitations, the study joins the voices calling for teacher training, textbook revision, innovations in teaching, teaching 21st century skills, and preparing learners to become lifelong learners who think critically.

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Appendices

Appendix A: Participants' responses to (Section I)

Questions	**Middle school (12)**		**Secondary (44)**		**Tertiary (34)**	
	True	False	True	False	True	False
1. Critical thinking is useful only in Western Cultures. (False)	0%	100%	9.10%	90.90%	2.90%	97.10%
2. As people grow older, they naturally develop as critical thinkers. (False)	41.70%	58.30%	65.90%	34.10%	55.90%	44.10%
3. Critical thinking is self-disciplined. (True)	41.70%	58.30%	65.90%	34.10%	64.70%	35.30%
4. Critical thinking enables one to think more deeply. (True)	100%	0%	100%	0%	97.10%	2.90%
5. One should not analyse sympathetically points of view that are disgusting and obviously false. (False)	66.70%	33.30%	59.10%	40.90%	55.90%	44.10%
6. If a statement is unclear, we benefit by asking what our purpose is in saying it. (True)	83.30%	16.70%	86.40%	13.60%	88.20%	11.80%
7. Implications are conclusions you come to in a situation. (False)	50%	50%	61.40%	38.60%	70.60%	29.40%
8. Critical thinking is important in learning to read well. (True)	91.70%	8.30%	100%	0%	94.10%	5.90%
9. Critical thinkers use subjective standards to assess thinking. (False)	33.30%	66.70%	34.10%	65.90%	14.70%	85.30%
10. Critical thinkers learn to ignore their emotions when making important decisions. (True)	91.70%	8.30%	77.30%	22.70%	82.20%	17.80%

Appendix B: Participants' responses to Section II

Questions	**Middle school (12)**				**Secondary (44)**				**Tertiary (34)**			
	Strongly Agree	Agree	Disagree	Strongly disagree	Strongly agree	Agree	Disagree	Strongly disagree	Strongly agree	Agree	Disagree	Strongly disagree
1. Critical thinking is a method of thinking which would help students enjoy the learning process.	50%	50%	0%	0%	50%	45.50%	4.50%	0%	55.90%	44.10%	0%	0%
2. Critical thinking should always include a reflective component.	50%	41.70%	8.30%	0%	52.30%	47.70%	0%	0%	50%	47.10%	2.90%	0%
3. I am aware when students use critical thinking in my courses.	33.30%	66.70%	0%	0%	25%	68.20%	6.80%	0%	29.40%	64.70%	5.90%	0%
4. I look for specific evidence of critical thinking by students in my courses.	8.30%	75%	16.70%	0%	11.40%	68.20%	20.50%	0%	23.50%	67.60%	8.80%	0%
5. I have the skills necessary to promote critical thinking by students in my courses.	25%	50%	25%	0%	6.80%	61.40%	29.50%	2.30%	23.50%	67.60%	8.80%	0%
6. I think that students have barriers to critical thinking, regardless of the strategies I use.	0%	58.30%	25%	16.70%	20.50%	63.60%	15.90%	0%	14.70%	44.10%	38.20%	2.90%
7. If required, I could implement critical thinking into my courses.	41.7	50%	8.30%	0%	43.20%	52.30%	4.50%	0%	38.20%	55.90%	5.90%	0%
8. In order for me to fully implement critical thinking into my courses I would need additional support.	33.30%	66.70%	0%	0%	43.20%	50%	4.50%	2.30%	26.50%	44.10%	26.50%	2.90%

Appendix C: Participants' responses to Section III

Questions	**Middle school (12)**				**Secondary**				**Tertiary (44)**			
	Strongly agree	Agree	Disagree	Strongly disagree	Strongly agree	Agree	Disagree	Strongly disagree	Strongly agree	Agree	Disagree	Strongly disagree
1. I believe that it is my responsibility to promote critical thinking in my courses.	25%	66.70%	0%	8.30%	52.30%	38.60%	9.10%	0%	47.10%	47.10%	2.90%	2.90%
2. Critical thinking engages students' higher order thinking (analysis, synthesis, and evaluation).	66.70%	33.30%	0%	0%	72.70%	25%	2.30%	0%	82.40%	17.60%	0%	0%
3. Critical thinking encourages students to become independent thinkers.	75%	25%	0%	0%	88.60%	11.40%	0%	0%	76.50%	23.50%	0%	0%
4. Critical thinking encourages students to become active learners.	33.30%	58.30%	8.30%	0%	77.30%	22.70%	0%	0%	67.60%	29.40%	2.90%	0%
5. Critical thinking can be used to achieve better learning outcomes.	50%	50%	0%	0%	65.90%	34.10%	0%	0%	52.90%	44.10%	2.90%	0%
6. Critical thinking will allow students a better understanding of course topics.	58.30%	33.30%	8.30%	0%	68.20%	31.80%	0%	0%	52.90%	44.10%	2.90%	0%

Appendix D: Chi-square of the three levels of schooling across the questions

	Df	**Chi-square**
Enjoy learning	4	2.299
Reflective component	4	3.172
Awareness of CT use	4	1.122
Specific evidence	4	4.044
Possess skills for CT	6	9.737
Barriers persist	6	15.521*
Implement CT if required	4	0.445
Additional support needed	6	12.010
CT triggers higher thinking	6	8.306
CT makes independent thinkers	4	2.463
CT makes active learners	4	9.750*
CT leads to better outcomes	4	3.209
Better understanding of topics	4	4.653

* $\alpha < .05$

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