



## RELATIONSHIP BETWEEN MOROCCAN CPGE STUDENTS MOTIVATION AND CRITICAL THINKING

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### Abstract:

Critical thinking is gaining momentum in the digital era, particularly with the propagation of social media. Improving students' cognitive abilities is not just meant to have easy access to the job market, but to be equipped in the time of misinformation and fake news. However, effective enhancement of this cognitive skill in students requires motivation as an important ingredient; without motivation for critical thinking learning, teachers will fail in their attempts to improve their students' thinking skills. This article is an empirical study on the importance of motivation for critical thinking for CPGE students and its relationship with the students' levels of critical thinking. 120 CPGE students, both male and female, were involved in this study. As the study is experimental, the students were divided into two groups: experimental and control groups. The results of the data analysis revealed that the treatment groups outscored the control group students in the motivation for critical thinking learning; the data also showed a positive correlation between the treatment group's motivation for critical thinking and their level of critical thinking.

**Keywords:** motivation, critical thinking, CPGE, treatment group, control group

### 1. Introduction

The proliferation of fake news especially with the appearance of AI and the propagation of social media has made it a necessity for schools to focus more on critical thinking (Babii, 2020). The truth has been hard to spot, notable with the social media. Thus, improving students' cognitive skills is no longer just a skill to join to job market, but a necessity for them to avoid being victims of misinformation.

However, teachers' efforts to enhance students' critical thinking are not enough. The teachers' attempts to improve their students' cognitive abilities will remain futile, especially with unmotivated students. Students who are aware of the importance and utility of motivation make a great asset for teachers with concrete consequences.

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Students' motivation to improve their thinking abilities contributes to the improvement of their critical thinking abilities.

## 2. Moroccan CPGE Classes: The English Courses and Critical Thinking

CPGE or preparatory classes is a two-year training program for high school graduates. During these two years, students benefit from intensive training in different subjects (ex: English, mathematics, economics...).

The development of CPGE students' critical thinking is one of the main objectives of the program. CPGE classes have as a mission to train students and equip them with certain thinking skills such as problem-solving, decision-making, and critical thinking. For instance, the main objective of CPGE classes is to develop students' critical thinking and train qualified engineers and managers (Belghiti et al., 2016).

As for English, it is taught at the level of all the existing streams (engineering and economics). English language teaching courses are divided into two main parts: regular classes and Colles sessions. Based on the ministerial decree that determines the teaching hours in each stream, English courses (both regular and Colles) for science students are different from the ones that economics students take. For regular classes, science students have a two-hour session per week while economics students have a three-hour session per week. Similarly, for the Colles sessions (oral exams), science students sit for two hours of Colles sessions per week, and economics students sit for three hours of Colles sessions per week.

Since their creation, CPGE classes have been trying to develop students' critical thinking; for instance, the importance of critical thinking is explicitly clear in CPGE ELT guidelines (2007), which clearly emphasize that the teaching and learning of the English language can "*reinforce students' creative and critical thinking skills*" (ELT Guidelines for CPGE, 2007, p.1).

ELT CPGE guidelines also specify the teaching approaches that teachers should use in order to help students develop and manifest critical thinking skills. The CPGE guidelines urge CPGE teachers of English to adopt Bloom's cognitive taxonomy (1956). By integrating critical thinking in CPGE English classes, students will develop a sense of logic and a new way of thinking (ELT guidelines for CPGE, 2007).

## 3. Motivation to Develop Critical Thinking

Motivation is crucial for the learning process; it is the inner energy that drives students and makes them eager to learn (Facione, 2000; Harmer, 2001). Motivation strongly affects the process of learning; that is, the more motivated a person is about a given subject, the more s/he will be eager to learn about that subject (Bixler, 2006). Motivation helps sustain the students' effort in the pursuit of their objectives as Santrock (2009) put it "unmotivated students won't expend the necessary effort to *learn*" (as cited in Concepcion & Ye, 2018, p. 253). Motivation assists students who want to improve their cognitive abilities like creative thinking, problem-solving, and critical thinking.

In addition to playing a key role in the extent to which students devote efforts to developing their linguistic skills, for instance, motivation can affect the students' willingness to develop their critical thinking. The extent to which students are motivated to learn and improve their cognitive abilities and skills pushes them to persist and invest a lot of effort and energy to attain their goals, especially when they are aware of the importance and utility of studying and improving their critical thinking skills level.

Previous studies highlighted the interconnectedness between critical thinking and motivation. That is to say, highly motivated students are more likely to become good critical thinkers (Fransson, 1977; Garcia & Pintrich, 1992; Turner & Baskerville, 2011; Fahim & Hajimaghsoodi, 2014; Rajati et al., 2017). Highly motivated students attend English language classes because they are encouraged by their parents and/ or teachers, and they are highly interested in engaging in deep, challenging, complex cognitive learning processes and problem-based activities. So, according to these studies, students' high or low motivation affects either positively or negatively their critical thinking development. Likewise, several empirical studies on motivation and critical thinking have revealed a positive correlation between them (Rajati et al., 2017; Fahim & Hajimaghsoodi, 2014). For instance, Valenzuela et al. (2017) tried to measure the relationship between students' motivation and their critical thinking.

Based on Eccles & Wigfield's (2002) expectancy-value theory, Valenzuela et al. (2017) developed the Critical Thinking Motivation Scales model (CTMS). CTMS measures students' motivation to perform a critical thinking task based on two main constructs: **expectancy** (students' expectations about thinking critically) and **value** (the value of thinking critically) (Valenzuela et al., 2017). This latter is composed of four sub-constructs: attainment, utility, cost, and interest (intrinsic/ extrinsic value).

Valenzuela et al. (2017) explained the four sub-elements of the value construct. **Attainment** "corresponds to how important it is for the subject to perform a given task well" (p. 380-381); as far as the other sub-constructs (utility, cost, and interest) Valenzuela et al. (2017) said that **utility** corresponds to the importance and usefulness of critical thinking, and **cost** refers to the efforts the task of critical thinking demands; **interest**, however, is about the feeling of enjoyment when engaging in a task. In an academic study on critical thinking skills, Belghiti (2012) reported that there was a close correlation between Moroccan university students' motivation and critical thinking development.

## 4. Method

### 4.1 Research Design

This study adopts Quantitative research where the experimental design is used to determine the causality between the different variables: motivation for critical thinking and critical thinking. A post-test is conducted after the treatment or intervention and the objective is to compare the results of the experimental group with those of the control group.

## 4.2 Hypothesis

In this study, it is hypothesized that CPGE students' degree of motivation to enhance their critical thinking can affect either positively or negatively their level of critical thinking.

## 4.3 Research Questions

Based on the above hypothesis this study tries to answer the following questions:

- 1) To what extent does the treatment group differ from the control one in the motivation for critical thinking?
- 2) Is there a relationship between CPGE students' motivation for critical thinking learning and critical thinking level?

## 4.5 Participants

The study involved 120 CPGE freshmen. The students were divided into two main groups: experimental (60 students) and control (60 students); the main participants included both male and female students. The selection of the participants was based on non-random purposeful sampling.

The experimental group was exposed to a nine-week course on critical thinking. The treatment took place every week, and the instructional intervention was based on Lauren Starkey's book *Critical Thinking Skills Success in 20 Minutes a Day* (2004); throughout the nine weeks of the instructional intervention, the students in the experimental group received training on three major skills: problem-solving, persuasion techniques, and argumentation.

Unlike the experimental group, the control group did not receive any systematic courses on critical thinking skills. Over nine weeks, the control group students did not receive any instructional intervention on problem-solving, persuasion, or argumentation. However, the students were taught general English; they studied English through the four skills: reading, writing, listening, and speaking.

## 4.6 Instruments

After the nine-week treatment period, the students from both groups sat for a posttest on critical thinking, and they also were asked to fill out the Critical Thinking Motivational Scale (CTMS).

The test was designed by Valenzuela et al. (2011) to measure the degree of CPGE students' motivation to think critically. The following test measures students' motivation to think critically based on five factors: utility, interest, cost, attainment, and expectancy.

### 4.6.1 Critical Thinking Motivational Scale (CTMS)

The test was designed by Valenzuela et al, (2011) to measure the degree of CPGE students' motivation to think critically. It measures students' motivation to think critically based on five factors: utility, interest, cost, attainment, and expectancy. It is divided into six sections and includes a total number of 20 items.

Table 1 below gives details about the number of items in each section. To survey students' motivation for critical thinking, the test uses a five-point Likert scale. For each item participants respond by choosing values from 1) strongly disagree to 4) strongly agree.

**Table 1:** Critical Thinking Motivational Scale (CTMS)

Sections	Title of sections	No. of items
I	Utility	5
II	Interest	4
III	Cost	3
IV	Attainment	4
V	Expectancy	4

Students from the experimental and control groups took the test. The students' response rate was 100% since the test was conducted in the classroom under the supervision of the researcher to make sure that all students with no exception complete the tests and submit them to the researcher.

#### 4.6.2 Critical Thinking Posttest

After the intervention, the experimental group took a test on critical thinking to measure their level of critical thinking. The test questions are designed to reflect Bloom's cognitive taxonomy (1956): knowledge, comprehension, application, analysis, synthesis, and evaluation. To gauge students' critical thinking levels FAMU Critical Thinking Rubrics (2009), an analytic band score, is deployed to quantify students' answers.

#### 4.7 Data Analysis

The collected data was analyzed quantitatively through SPSS software. This software provides the ability to process the collected data in the form of descriptive and inferential statistics.

### 5. Results Analysis and Discussion

CPGE students from both groups were surveyed to explore the extent to which they are motivated to learn and improve their critical thinking level. To this end, the descriptive statistics (mean score, standard deviation, maximum, and minimum) were first conducted before any further statistical analysis.

A close analysis of the descriptive statistics in Table (2) revealed some differences between the experimental group and the control group. The total mean score obtained by the experimental group was ( $M=85.33$ ,  $SD=7.82$ ). However, the control group scored ( $M=81.01$ ,  $SD=11.03$ ). The general descriptive statistics show the fact that the experimental group exhibits a relatively higher level of motivation to improve their thinking skills in comparison to the control group.

**Table 2: Students' Level of Motivation for Critical Thinking**

Groups	Subscales	Min	Max	Mean	SD
Experimental	Expectancy	8	20	14.95	2.72
	Utility	12	25	21.61	2.89
	Interest	11	20	17.90	2.44
	Cost	8	15	12.16	2.26
	Attainment	13	20	18.70	1.57
	Total	64	100	85.33	7.82
Control	Expectancy	10	20	14.20	2.20
	Utility	6	25	21.68	3.96
	Interest	6	20	16.26	2.76
	Cost	6	15	11.25	1.87
	Attainment	4	20	17.61	3.02
	Total	36	94	81.01	11.03

Descriptive statistics revealed some differences between the two groups concerning their motivation to enhance their critical thinking level. However, an independent samples *t*-test was conducted to check whether there were any significant differences between the two groups' levels of motivation. The following Table (3) shows the two groups' general scores on motivation for critical thinking.

**Table 3: Comparison between the experimental and control groups' level of motivation for critical thinking: Independent –Samples T-test**

Groups	Df	MD	T-value	Sig
Experimental	118	4.31	2.472	.015
Control				

The Sig. (2-tailed) in Table (3) above is less than (.05) more specifically,  $p < .05$  [ $t(118) = 2.472, p = .015$ ]. This indicates that the experimental group's motivation for critical thinking is significantly higher than that of the control group.

A *t*-test was conducted to see whether there were any significant differences between the two groups' motivation for critical thinking in all the subscales, namely: utility, interest, cost, attainment, and expectancy.

The results of the analysis are shown in Table 4 below:

**Table 4: Comparison between the Experimental and Control Groups' Motivation Subscales: Independent-Samples T-Test**

Subscales	Groups	MD	t-value	Sig.
Utility	Experimental	-.66	-.10	.916
	Control			
Interest	Experimental	1.63	3.42	.001
	Control			
Cost	Experimental	.91	2.41	.017
	Control			
Attainment	Experimental	1.08	2.46	.015
	Control			
Expectancy	Experimental	.75	1.65	.10
	Control			

The *t*-test analysis conducted on the motivation subscales shows that there are significant differences between the two groups at the subscales of interest, cost, and attainment as the *p*-value indicates ( $p < .05$ ). However, the two groups show the same level of motivation at expectancy and utility subscales because the *p*-value is greater than (.05). These results show that both groups believe in the usefulness and utility of critical thinking, and they both have the same expectations about critical thinking learning. However, unlike the control group, the experimental group showed a high interest in critical thinking learning, they were ready for any cost to attain high levels of critical thinking.

Though the experimental group slightly outscored the control in most of the subscales, the control group students slightly outscored the experimental group students in the utility construct; the mean score obtained by the group in the utility construct is ( $M=21.68$ ), which is slightly higher than that of the experimental group ( $M= 21.61$ ). The results of the Descriptive statistics and the *t*-test indicate that the participants in the experimental group are more motivated to learn and improve their level of critical thinking than the control group because of the professional, social, and academic benefits of critical thinking.

## 6. Relationship between Students' Motivation and Critical Thinking

To investigate the relationship between the students' obtained level of critical thinking and their motivation for critical thinking learning, the researcher conducted a correlation test. The results of the correlation aimed to verify whether the student's level of critical thinking skills after the treatment correlate positively or negatively with their motivation for critical thinking learning.

A Pearson Product Moment correlation analysis was conducted to measure the relationship between students' motivation to learn critical thinking (independent variable) as measured by the Critical Thinking Motivation Scales model (CTMS), and their level of critical thinking skills (dependent variable). The results of the correlation are presented in the matrix below (Table 5).

**Table 5:** Correlation between Critical Thinking Skills and Motivation for English Language Learning

	Total motivation for critical thinking
Critical thinking skills	Pearson Correlation <b>.264*</b>
	Sig. (2-tailed) <b>.042</b>

\*. Correlation is significant at the 0.05 level (2-tailed)

\*\*. Correlation is significant at the 0.01 level (2-tailed)

The correlation tests demonstrated a statistically significant positive correlation between students' motivation to learn critical thinking and their level of critical thinking since the *p*-value ( $p = .042$ ) is inferior to the threshold value of (.05). The positive correlation shows that the more CPGE students are motivated, the more they can improve their critical thinking skills, and the better their level of critical thing skills becomes.

Accordingly, the results obtained from the correlation tests revealed that there was a significant correlation between students' motivation to learn critical thinking and their level of critical thinking skills. The stronger the students' motivation to improve their thinking skills is, the higher their level of critical thinking skills gets. In other words, motivation provides a strong drive that can help improve and sustain students' level of critical thinking.

## 7. Discussion

The statistical analysis indicated that both experimental and control groups did not have the same level of motivation to learn critical thinking; This difference can be attributed to the treatment that the students in the experimental group benefitted from; however, the students who did not benefit from the treatment were not as motivated as the experimental group students. The variance test of the different subscales confirmed the difference between the two groups on all the subscales, except the utility and expectancy constructs where the two groups turned out to be similar. This indicates that students from both groups are aware of the importance of studying and improving their level of critical thinking; however, since the control group students were not exposed to critical thinking through explicit instruction, they were not able to practically see the utility of learning critical thinking nor did they show high expectations towards it. This result goes in line with Bilik et al.'s (2020) study; the researchers found out that the experimental group's scores on the Critical Thinking Motivational Scale subscales significantly differ from the control group. Thus, we can claim that critical thinking-based instruction raises CPGE students' awareness of the importance and utility of critical thinking and boosts their motivation to invest a lot of effort and energy to improve their thinking skills.

As for the correlation analysis of CPGE students' motivation to learn critical thinking and their level of critical thinking skills, the results demonstrated a significant positive correlation, which indicates a strong association between motivation for critical thinking learning and critical thinking development. On the other hand, there is a weak and positive correlation between CPGE students' overall critical thinking level and different subscales of motivation for critical thinking learning. This interconnectedness between critical thinking and motivation for critical thinking learning indicates the role of motivation in facilitating the process of learning and improving critical thinking skills. Numerous studies revealed the connectedness between the motivation to learn and develop critical thinking and the level of critical thinking (Rajati et al., 2017; Fahim, & Hajimaghsoodi, 2014; Valenzuela et al., 2011). This link highlights and stresses the role of motivation for critical thinking in improving CPGE students' level of critical thinking.

## 8. Conclusion and Implications

The quantitative findings of the experimental group on motivation for critical thinking learning indicate that being exposed to classes based on critical thinking contributes to students' motivation to improve and enhance their thinking skills. Moreover, the

correlation analysis between the experimental group's motivation for critical thinking and their critical thinking reveals that the more CPGE students have high motivation for critical thinking, the higher their level of critical thinking skills becomes. In other words, CPGE students' level of critical thinking improves when they are more motivated to learn and improve their thinking skills. CPGE students' motivation for critical thinking learning is a factor that helps sustain the students' efforts and endeavors to learn and improve their thinking abilities.

This study provides important implications for teachers who want highly motivated students and who try to improve their thinking skills. Being exposed to critical thinking makes students highly motivated to engage in critical thinking learning (Bilik et al., 2020). Thus, CPGE students' awareness of the importance and utility of critical thinking boosts their motivation to invest a lot of effort and energy to improve their thinking skills.

Moreover, effective teaching of critical thinking requires teachers' training in critical thinking. Teachers who have never benefited from any training in critical thinking teaching can never be aware of the importance of cognitive skills for students. Besides, their teaching attempts at enhancing their students' critical thinking will remain personal and improvised attempts that might not have any effect on students' cognitive skills.

### **Conflict of Interest Statement**

The author declares no conflicts of interest.

### **About the Author(s)**

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### **References**

- Alenzuela, J., Nieto, A. M., & Saiz, C. (2017). Critical Thinking Motivational Scale: A Contribution to the Study of Relationship between Critical Thinking and Motivation. *Electronic Journal of Research in Education Psychology*, 9(24), 833-848.
- Babii, A. N. (2020). The Use of Critical Thinking against Fake News. *NORDSCI*.
- Belghiti, K., El Kirat El Allame, Y., & Chana, M. (2016). Critical Thinking Development: The Case of the English Course in the CPGE Classes in Meknes, Fes, and Kenitra. *Arab World English Journal*, December 2016 ASELS Annual Conference Proceedings.
- Bilik, Ö., Kankaya, E. A., & Deveci, Z. (2020). Effects of Web-based Concept Mapping Education on Students' Concept Mapping and Critical Thinking Skills: A Double-Blind, Randomized, Controlled Study. *Nurse Education Today*, 86, 104-312.

- Bixler, B. (2006). Motivation and Its Relationship to the Design of Educational Games. Paper presented at the NMC. Cleveland, Ohio. Retrieved 2019 from: <http://archive.nmc.org/events/2006summerconf/materials/Bixler/m&g.pdf>.
- Bloom, B. (ed.). (1956). *A Taxonomy of Educational Objectives. Handbook I: Cognitive Domain*. New York: McKay
- Centre National de l'Innovation Pédagogique et de l'Expérimentation Ministère de l'Education Nationale et de la Formation Professionnelle. (2007). CPGE ELT Guidelines.
- Concepcion, E. A., & Ye, Y. (2018). A Comparative Study of Grades 7, 8, and 9 Students' Motivation for Learning English as A Foreign Language in The Regular Program and English Program at Tepleela School, Bangkok, Thailand. *Scholar: Human Sciences*, 9(2), 251.
- Eccles, J. S., & Wigfield, A. (2002). Motivational Beliefs, Values, and Goals. *Annual Review of Psychology*, 53 (1), 109-132.
- Facione, P., Facione, N., & Giancarlo, C. (2000). The Disposition Toward Critical Thinking: Its Character, Measurement, and Relationship to Critical Thinking Skill. *Informal Logic*, 20(1), 61-84.
- Fahim, M., & Hajimaghsoodi, A. (2014). The Relationship Between Motivation and Critical Thinking Ability of Iranian EFL learners. *International Journal of Language Learning and Applied Linguistics World*, 5(2), 605-619.
- Fransson, A. (1977). On Qualitative Differences in Learning: IV—Effects of Intrinsic Motivation and Extrinsic Test Anxiety on Process and Outcome. *British Journal of Educational Psychology*, 47(3), 244-257.
- Garcia, T., & Pintrich, P. R. (1992). Critical Thinking and Its Relationship to Motivation, Learning Strategies, and Classroom Experience. Paper Presented at the Annual Meeting of the American Psychological Association. Washington, DC. (ERIC Document Reproduction Service No. ED 024 644).
- Harmer, J. (2001). *The practice of English language teaching*. Essex: Pearson Education.
- Mendoza, N. B., Yan, Z., & King, R. B. (2023). Supporting students' intrinsic motivation for online learning tasks: The effect of need-supportive task instructions on motivation, self-assessment, and task performance. *Computers & Education*, 193, 104663
- Rajati, P., Tamjid, N. H., & Ahangari, S. (2017). The Effect of Teaching Critical Thinking Skills on Iranian Advanced EFL Learners' Motivation. *Journal of Instruction and Evaluation*, 10(38), 157-173.
- Turner, M., & Baskerville, R. F. (2011). Assessment and Intrinsic Motivation. Retrieved from: <https://ssrn.com/abstract=1912132>
- Urhahne, D., & Wijnia, L. (2023). Theories of Motivation in Education: an Integrative Framework. *Educational Psychology Review*, 35(2), 45.

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