| RESEARCH ARTICLE

A Descriptive Panorama of Metacognitive Knowledge among Students in the Moroccan University

Abdelhay Jarrar

Moulay Ismail University, School of Arts and Humanities- Meknes, Morocco
Corresponding Author: Abdelhay Jarrar, **E-mail**: a.jarrar@edu.umi.ac.ma

| ABSTRACT

One of the key concerns of second language acquisition research is language learning strategies and the extent to which these strategies lead to successful language learning and academic achievement. Indeed, there is a consensus among researchers that learners who take charge of their own learning are academically more likely to succeed than their counterparts. In this respect, a large body of research has proven that metacognitive knowledge is critical in language learning. For this reason, this study is conducted, which is exploratory in nature. It aims at describing Moroccan English department students' metacognitive knowledge across three geographically distinct schools of art and humanities. Henceforth, the study included 136 participants belonging to three universities, mainly Kenitra, Meknes, and Oujda. To answer the research questions of this study, the respondents were asked to complete a self-report metacognitive questionnaire with a focus on argumentative writing. Findings displayed that Moroccan English university students' metacognitive knowledge is strong. Furthermore, this study indicated that when age is at play, adults have higher metacognitive knowledge than young learners.

1. Introduction

Accounting for the factors affecting language acquisition, the mechanisms learners follow as they move towards achieving the target language, and why it is that some learners are much more successful than others has been a major concern for researchers across many disciplines (Rubin, 1975). In fact, there have been many theories trying to explain the mechanisms language learners undergo towards the acquisition of a second language, which has been extensively evident in studies and theories of language and language learning (e.g., Mayer, 1996; Schneider & Pressley, 1997). To illustrate, Rubin (1975) contends that successful language learning depends on at least three variables: aptitude, motivation, and opportunity. Although these three variables are, by definition, interrelated, aptitude has gained much more attention during the last few decades. According to this school of thought, language learning occurs from within, implying that successful language learners tend to make use of some cognitive and metacognitive learning strategies that self-regulate and thus facilitate the process of language learning (Wenden, 1986; Msaddek, 2020).

With this in mind, this new trend has paved the way for other researchers to investigate this area (e.g., Oxford, 1990; O'Malley & Chamot, 1990). For instance, metacognitive learning strategies are part of Chamot and O'Malley's (1990) learning strategies, wherein they divided these strategies into cognitive and metacognitive. Generally, while the cognitive includes the direct use of strategies such as predicting, guessing, and summarizing and are subject specific, metacognitive is rather indirect, self regulates one's thinking, and is manifested across all subjects. To the best of our knowledge, although many research studies have been conducted in this respect, few studies have been interested in exploring learners' metacognitive knowledge state, mainly in the

Moroccan university, in order to reconsider some of the educational practices along with paving the way towards the conduction of other research studies.

2. Review of Literature
This section attempts to contextualize the study under investigation within previous research by first defining key terms related to the theme of the paper. Second, the section reviews the main models underlying the theory of metacognition and, third, a brief summary of the main studies conducted in relation to this research under investigation.

2.1. Metacognition
Anderson (2012) sees metacognition as "the ability to make one's thinking visible" (p. 170). Flavell (2004, cited in Santrock, 2011, p. 284) defines it as "cognition about cognition" or "knowing about knowing". Metacognition thus implies self-regulating one's own thinking for the purpose of solving problems confronting language learners. Likewise, the term metacognition has had many varying labels, wherein, in some cases are used as synonyms and other times as completely different. In this study, the term metacognition will be used as a synonym for "metacognitive ability, metacognitive knowledge, metacognitive awareness, and metacognitive strategies" (Baker & Brown, 1984; Sheorey & Mokhtari, 2001; Carrell, 1989; Mokhtari & Sheorey, 2002; Berkowitz & Cicchelli, 2004; Chen et al. 2009; all cited in Yuksel & Yuksel, 2012, p. 895).

The use of learners' metacognitive knowledge has been indispensable in language learning, and this has been discussed in the literature during the past few decades (Flavell, 1979; Oxford, 1990; Wenden, 1998; Schraw, 1998). Studies investigating its effect on learners' academic achievement have been in support of learners' use of their metacognitive knowledge in language learning. To exemplify, in the context of writing skills, Yanyan (2010) pointed out that metacognitive knowledge is important for successful academic writing. To support this view, he conducted a correlational study with 120 Chinese participants. Yanyan found that learners' metacognitive knowledge and its three components, person knowledge, task knowledge, and strategic knowledge, are all positively correlated with English writing performance. He concluded that successful employment of metacognitive knowledge helps in facilitating EFL learners' writing proficiency.

Similar to Yanyan (2010), Moussaid (2005) conducted an experimental study where he examined the influence of self-efficacy and its relationship to the effect of metacognitive strategy training on argumentative essay writing performance among Moroccan high school EFL students. Three groups were used in this study; two experimental groups were divided according to whether their motivation was high or low, and a control group. The two experimental groups received metacognitive strategy training in the planning of argumentative essays, while the control group received no treatment. Results showed that the two experimental groups displayed a significant improvement compared to the control group, whose performance remained the same. Similar results were found in Pour Feiz's (2016) study, which investigated the relationship between metacognitive knowledge and attitudes among pre-service English teachers. His results showed a significant relationship between the participants' perceptions of metacognitive awareness and their attitudes toward foreign language education.

2.2. Models of Metacognition
Although the elements that make up the models share some characteristics in common, every single model, however, has some specific features that distinguish it from the others. According to Schraw and Moshman (1995), theories that account for metacognition are not static but dynamic as they change over time, from person to person and with individuals' experience. As a result, new theories emerge as empirical research replicates the previous ones. It is through these models, nonetheless, that metacognition can be understood. Henceforth, the following will discuss these models in brief and try to construct a theoretical framework that will be used as a criterion for the current study and through which students' metacognitive knowledge will be measured.

Flavell (1979) was the first pioneer who created a model that includes four elements describing the nature of metacognition. These elements were modified afterward by many other researchers to include other new components. Generally, there are two major elements that make up metacognition. These are *knowledge about cognition* and *control of cognition*, and each of these consists, in turn, of subcomponents. These elements, however, have not been viewed in the same way as there are scholars who advocate the first element, knowledge about cognition, which includes task, person, and strategy knowledge, while there are others who are in support of the second component – control of cognition (Schraw & Moshman, 1995).

More than that, some researchers did not limit metacognition to the above-mentioned elements, but rather they considered other emotional types such as motivation, self-appraisal, and self-management as part and parcel of metacognition (e.g., Paris et al., 1983 & Paris & Winograd, 1990, as cited in Noushad, 2008), meaning that they do not only view metacognition as a construct that entails only things that are cognitive, but they also consider anything that is psychological or affective to be metacognitive. In another recent model, Pena-Ayala (2015) looked at metacognition from both a neurological and a biological view. This model does not only describe, as is the case with other models but also explains how metacognitive processes occur within a learner's mind.

Nevertheless, and in spite of these controversies regarding the nature of this concept, Schraw and Moshman (1995) delimited the concept into two main features and defined metacognition as *knowledge* and *regulation* of cognition. They divided the former into three kinds of knowledge—declarative, procedural, and conditional knowledge, whereas the latter consists of planning, monitoring, and evaluating, which help learners self-regulate their learning.

As will be discussed within the methodology part, this study adopts Schraw and Moshman's model, and all of its elements will be operationalized within the data collection method, along with including argumentative writing as the main content of the self-report questions.

2.3. Previous Research
In spite of the critical role of metacognition in academic achievement, previous research on students' metacognitive knowledge state has been found to be under the standards in a number of empirical studies. For instance, to test secondary school students' metacognitive knowledge in Nigeria, Okoza et al. (2013) conducted an exploratory study with 1200 students. The study found that secondary school students' use of metacognitive awareness of learning strategies is poor and that there is no discernible variation in this usage between students in junior secondary and senior secondary schools. The researchers concluded that the reason why there is no significant difference between both classes of students may be due to the paucity of metacognitive skills training in the Nigerian school system from early childhood. Likewise, using a retrospective questionnaire, Msaddek (2020) investigated Moroccan English department learners' awareness and use of cognitive and metacognitive reading strategies. Findings showed that Moroccan EFL learners' (meta) cognitive strategy awareness and usage are characterized by insufficiency.

Similar to the afore-discussed studies, the current research aims at investigating Moroccan university students' metacognitive state, as little research has been conducted in this area, mainly in the Moroccan context. Henceforth, and to address the lack of research, this paper aims to investigate the state of metacognitive knowledge among Moroccan university students, hoping for meaningful, significant, and new information in the research area. Thus, the current study addresses the following research questions:

1) What is the state of Moroccan university English department students' metacognitive knowledge?
2) To what extent does gender affect Moroccan university students' metacognitive knowledge?
3) To what extent does age predict Moroccan university students' metacognitive knowledge?

3. Method
3.1. Participants
The population of this study is third-year (Semester 6) English department students studying at three public Moroccan universities, schools of art and humanities during the academic year (2014/2015). A sample of 136 participants opted for the test. The selection of the participants was based on a quota sampling, where 40 students were from Kenitra (18 males and 22 females), 56 from Meknes (14 males and 42 females), and the 40 remaining participants were selected from Oujda (19 males and 21 females). The total sample of the universities consisted of 50 males and 86 females, whose ages ranged from 19 to 43 (Mean = 22.47, SD = 3.29). Students were non-randomly chosen from different groups to set for a self-report questionnaire.

3.2. Instruments
Given the purposes stated above, data was collected through a self-report questionnaire. The reason behind using this quantitative method is that the study of metacognitive behaviors is approached from representative designs (Dunlosky, cited in Hacker et al., 2009, p. 4).

3.2.1. The Self-Report Questionnaire
The self-report questionnaire, or the metacognitive awareness inventory, is a data collection method that is different from the other well-known questionnaires; it is a self-report used to elicit learners' beliefs. In the literature, it is called an inventory or self-report, mainly because it is through such a method that psychological and metacognitive behaviours are measured (Schraw, 1998). It is used specifically to tap students' internal thinking that is not easily accessed through other instruments, and it is the most applied in metacognitive measurements (Schommer, 1990, Schraw, Bendixen, & Dunkle, 2002, as cited in Schraw, 2010).

As has been discussed in the review of literature, this framework is divided into two broad categories and each of which consists of three. Knowledge of cognition includes declarative, procedural, and conditional knowledge, whereas regulation of cognition is composed of planning, monitoring, and evaluating. Each of the six elements is assigned five items, with a total of 30 items. Each item/statement uses a five-point Likert scale: 1 (Never), 2 (rarely), 3 (sometimes), 4 (Usually), and 5 (Always). The aim of the Likert scale was quantitative in nature, meaning that the scale was given points rather than behavioural attitudes, and these marks ranged from one mark for never to five marks for always (see appendix 1). The instrument's score reliability is (alpha=0.87).

Moreover, items of the self-report questionnaire are based on Schraw and Moshman's (1995) theoretical framework, discussed earlier in the literature, and are adapted to suit the current study. To justify, first, most of the models that explain metacognitive knowledge were used to assess children; they were specifically created to measure children's metacognitive knowledge. Schraw

and Moshman's framework, however, was mainly created to assess adults, which will be the case in this study. Second, the second part of Schraw and Moshman's model, regulation of cognition, is concerned with writing as a process, namely monitoring, planning, and evaluating. And this skill is chosen as the content of the items included within the self-report, mainly argumentative writing, which is the main mode of measurement of university students' examinations. Last but not least, this model has not been empirically and exhaustively researched in the Moroccan EFL context, a fact of which can add to the existing body of knowledge.

Finally, to ensure that the items truly measure the intended constructs, the self-report questionnaire was given to two colleagues in the field to ensure which category each item belongs to before being piloted with a group of ten students.

3.3. Data Collection Procedure
The data was collected across three universities. Before the distribution of the data, the instruments were first tried out with a group of third-year English department university students from Meknes. Since the tests did not undergo any modifications, they have been kept and used with the other collected data. The data collection took place in May 2015. During this period, the self-report questionnaire was administered to students in different classrooms. The time allotted for completing the tests was 30 minutes, and 5 minutes were devoted to instructions.

3.4. Data Analysis Procedure
The SPSS statistical package was used as the main tool for analysing the data. The statistical tests that were used in this study include descriptive statistics and independent t-tests.

4. Results
4.1. Descriptive Analysis
Table 1 shows the mean scores and the standard deviations of students' metacognitive knowledge. The total score of university learners' metacognition is out of 150, whereas its elements, knowledge, and regulation of cognition are out of 75 each. When considered separately, each of the six metacognitive sub-elements– declarative, procedural, and conditional knowledge, and planning, monitoring, and evaluating– are in turn out of 25. The majority of respondents obtained more than an average score in the total and in each of the metacognitive sub-constructs. The standard deviation between scores also indicates that students' metacognitive knowledge is not dispersed. With respect to the knowledge of cognition mean score, students got 19.18 in conditional knowledge, whereas with regard to regulation of cognition, they scored 19.59 for evaluating. This generally implies that students' meta-thinking is high; they consciously employ their metacognitive knowledge to solve the problems related to argumentative writing.

Table 1.   Descriptive statistics of each metacognitive knowledge variable

	Mean	Std. Deviation
Knowledge of cognition	55.60	9.21
Declarative knowledge	18.42	3.45
Procedural knowledge	17.99	3.68
Conditional knowledge	19.18	3.55
Regulation of cognition	57.30	10.41
Planning	19.31	3.98
Monitoring	18.38	3.91
Evaluating	19.59	4.41
Metacognition (total)	112.90	18.21

4.2. Independent T-test Analysis
This section is devoted to independent T-test analysis. It is mainly concerned with the influence of gender and age, respectively, on metacognitive constructs both individually and generally.

4.2.1. Presentation of Metacognition by Gender
An independent T-test was carried out to see if there was any difference between the mean scores of males and females on metacognition. Results are shown in table 2. While the metacognitive mean score of males is 115.56, the mean score of females is 111.36. The difference between the mean scores of females and males is not statistically different (p = 0.17), implying that males' and females' mean scores are the same.

Table 2.   Independent t-test of metacognition by gender

	Gender	N	Mean	Std. Deviation	Sig. (2-tailed)
Metacognition	Male	50	115.56	16.05	0.17
	Female	86	111.36	19.27	

More than that, gender does not influence metacognition, even when the latter is divided into constructs. As is shown in table 3, the significance level of both knowledge of cognition (p = 0.13) and regulation of cognition (p = 0.29) is insignificant. Hence, this implies that gender affects neither students' metacognitive knowledge nor its component parts.

Table 3. Independent t-test of knowledge and regulation of cognition by gender

	Gender	N	Mean	Std. Deviation	Sig.
Knowledge of cognition	Male	50	57.06	7.71	0.13
	Female	86	54.75	9.92	
Regulation of cognition	Male	50	58.50	9.53	0.29
	Female	86	56.60	10.88	

4.3. Presentation of Age Effect on Metacognition
To testify the influence of age on metacognition, the participants' age was divided into two categories, adopting the median (Median = 22) as the cut point. Results of table 4 show that respondents whose age is above or equal to 22 years old have an average score of 113.40, whereas participants whose age is below 22 years old have a mean score of 112.21. The difference between the two groups' metacognitive knowledge reaches a high statistical significance (p = 0.006). This implies that age plays a significant role among students and that adults often have a higher metacognitive knowledge than younger students.

Table 4. Independent T-test of Metacognition by Age

	How old are you	N	Mean	Std. Deviation	Sig.
Metacognition	>= 22.00	79	113.40	16.12	.006
	< 22.00	57	112.21	20.89	

5. Discussion
The descriptive statistics (reported in table 1) of university students' metacognitive knowledge state was high, with a total mean score of (Mean = 112.9). Not only did they perform well in the total mean score, but also in each of the metacognitive six sub-constructs, with evaluating being the highest mark (Mean = 19.59) followed by planning (Mean = 19.31) and then conditional knowledge with an average of (Mean = 19.18).

The findings interestingly imply that, with respect to planning, Moroccan university students think about what they need to write before they begin, determine which ideas are important prior to writing the test, and use their prior knowledge to help them generate ideas. As for evaluation, the mean scores indicate that they carefully check their essays before submitting. The conditional knowledge average also signifies that students always check whether the arguments they provide are relevant to their aim. Henceforth, the findings of research question one thus do not coincide with the findings of previous studies (Okoza et al., 2013; Msaddek, 2020). In fact, the disparity in the results may be due to the advanced level of the participants in this study, as the literature indicates that metacognitive skills appear between the age of 8 and 10 and extend during the next years (Veenman and Spaans, 2005). This appears to be true as the findings of this study indicated that age is a predictor of students' metacognitive knowledge (table 4); that is to say, as learners get older, their metacognitive knowledge tends to increase with time.

6. Conclusion

The present study aimed to investigate Moroccan university students' metacognitive state, along with exploring whether the variables of gender and age are predictors of the participants' metacognitive skills. Thenceforth, using the self-report questionnaire with reference to argumentative writing, this study obtained the following results: 1) Moroccan advanced English university students' metacognitive knowledge is strong; 2) students' metacognitive knowledge is not affected by gender variable; 3) age is a predictor of students' metacognitive knowledge.

Since the current findings have shown that advanced learners of English metacognitive knowledge are high and because the literature highlights the usefulness of this knowledge in academic achievements, decision makers need to prioritize metacognitive skills in curriculum and syllabus development, mainly for beginners. This is because the acquisition of metacognitive skills at an early age will help in self-regulating learners' thoughts, a fact that will increase learners' academic achievement across all subjects. Moreover, when designing instructional activities, teachers should improvise techniques that help students reflect upon their own thinking. Such a reflection may include learning how to understand oneself. If instructors teach students how to understand their strengths and weaknesses in constructing a good argument, they will surely become self-aware about their own weaknesses in arguing and thus try to work on that autonomously, keeping what they already know and reading about the things in which they still have difficulties.

In sum, as with any other piece of research, this study has some limitations. First, the participants of this study are advanced learners of English; the participation of beginners may have helped the researcher to recognize if there was any difference between advanced and beginners' metacognitive knowledge. Therefore, future research may include both beginner and advanced learners of English so as to find out the extent to which both groups differ from each other with regard to their metacognitive knowledge. Second, the metacognitive questionnaire that was used to elicit students' thinking does not guarantee the truthfulness of their behaviours. Students could have ticked some metacognitive items that do not really reflect what they were thinking of; thus, future studies may replicate the study, perhaps with a different methodology combined, for instance, by a self-report and observation. In brief, both the inconsistency of the current findings with previous research and the limitations mentioned above cry for further studies to duplicate the current results and deepen the understanding of the phenomenon.

Conflicts of Interest: The authors declare no conflict of interest.
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Author's Bio: Abdelhay Jarrar is a doctoral student at Moulay Ismail university in Morocco. He is an MA holder in the field of Applied linguistics. His research interests, in which he has published a number of articles, include second language acquisition, interlanguage pragmatics, and intercultural communication. Abdelhay Jarrar is also an English teacher in the secondary school public sector.

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