The Effects of Bilingualism and Language Attitudes on Algerian Students' Academic Proficiency in Medical Sciences

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Abstract: *This study examines learners' Cognitive Academic Language Proficiency and Basic Interpersonal Communicative Skills in L2 in order to determine the accuracy level of French oral language proficiency and academic achievement of students in Medical sciences (Tlemcen University). Adopting a few sociolinguistic research tools, the researcher has obtained some results confirming that students often lag behind in academic performance due to the delay in the development of Cognitive Academic Language Proficiency (CALP) and to the complexity of bilingual language acquisition despite their apparent language fluency which reflects their achievement in Basic Interpersonal Communication Skills interpreted as communicative success. Another important aim in this research was to analyze the effects of students' attitudes towards French***.***

Keywords: *Bilingualism, BICS, CALP, code switching, language attitudes.*

Résumé : *Cette étude examine les compétences linguistiques cognitives académiques et les compétences de communication interpersonnelle de base des apprenants en L2 afin de déterminer le niveau de précision de la maîtrise de la langue française orale et la réussite scolaire des étudiants en sciences médicales (Université de Tlemcen). En adoptant quelques outils de recherche sociolinguistique, la chercheuse a obtenu des résultats confirmant que les élèves sont souvent à la traîne dans leurs performances scolaires en raison du retard dans le développement de la compétence cognitive en langage académique (CALP) et de la complexité de l'acquisition du langage bilingue malgré leur apparente maîtrise de la langue. Ce qui reflète leur réussite dans les compétences de base en communication interpersonnelle interprétées comme un succès communicatif. Un autre objectif important de cette recherche était d'analyser les effets des attitudes des élèves envers le français.*

Mots-clés : *Bilinguisme, BICS, CALP, changement de code, attitudes linguistiques.*

1. Introduction

Education in Algeria is conducted in a complex multilingual environment, a kind of complexity which is more the norm than the exception around the world (Cummins, 2000). The process of language acquisition will be studied by examining the distinction between Students' language use or Basic Interpersonal Conversation Skills (BICS) and Cognitive Academic Language Proficiency (CALP). The complexity in the state derives in part from the diglossic nature of the Arabic language – where dialects are used for informal purposes alongside Modern Standard Arabic (language of literacy) – and from the widespread use of the French language which is reflecting the Algerian's colonial history and its growing dominance in the domains of science and technology.

This study examines learners' language use and its implication on Cognitive Academic Language Proficiency in order to determine the accuracy level of language proficiency and academic achievement of students. Such a context raises many questions for educational policy and practice in general and for students at the level of university in particular. Some particularly important questions include:

Q1. Do students develop their academic language proficiency in an adequate manner, to reach successful achievement?

Q2. What are the essential reasons behind students' academic incompetence?

Q3. What are the students' attitudes towards French and its implementation as a language of instruction in Medical Sciences?

On the basis of these issues, this study seeks to find answers and thus we put forward the following hypotheses:

- We hypothesize that the vast majority of students in Medical sciences show little confidence conducting oral presentation in the French language and have difficulty confronting with the academic language demands. Their verbal repertoire is simplified in shorter expressions, more commonly used vocabulary words and they switch codes for reasons of improving communication.

- It is also hypothesized that students in Medical Sciences are ill- prepared to cope with the academic demands which require Cognitive Academic Language Proficiency (CALP); as well as students' general lack of interest and confidence, lack of knowledge of French, lack of knowledge of the subject area and the absence of reading from the part of the learners which has a negative impact on their linguistic development.

- Students' linguistic behaviour results from their attitudes towards the language that determines consciously or unconsciously their adoption or rejection of a given language. The acquisition and language use of L2 is determined by the value of French in their studies and also is perceived as a socially prestigious practice.

The goal of this study is to outline an agenda for research into issues of language in education in Algeria taking language use and academic achievement as an assumed objective.

2. Literature Review

This study offers a brief review of the literature related to academic achievement to give a clear definition of what it means to be proficient in academic language. It also analyzes theories surrounding diaglossia, bilingualism and language learning presenting them as either subtracting or adding to student's learning capacities, depending on both the social and learning situations in which Algerian university students find themselves at a higher level. It may be helpful to look first at

the underlying theories of language acquisition and then at the language-related factors that affect and influence acquired academic register that promotes or diminishes language improvement. Then, we deal with the main learners' strategies used to help enhance their proficiency over time and to reduce the effects of language attrition; the last part sheds light on different attitudes about the target language among language learners.

This study begins by summarizing research-based principles that have been proposed as a basis for guiding education policy and practice in Algeria. These principles have been developed based on research conducted predominantly in Canada and the USA and with attention to the general academic achievement of students in bilingual settings.

This research work addresses the above questions through an analysis of two second language acquisition theories: Krashen theories (1976, 1978, 1982) and Cummins' theories (1979,1982, 2001). Clearly, the answers to these questions will be of both theoretical and practical interest. Krashens' theories are composed of four hypotheses that explore the linguistic aspects of language acquisition and provide an answer to the question of how people acquire and learn a second language. Krashen (2007:391) mentions that:

> Pedagogy in developing academic proficiency has been dominated by the assumption that academic linguistic proficiency and knowledge of academic content can be described and taught directly. My goal is to reduce this axiom to the status of hypothesis: There is strong evidence that academic language proficiency is acquired through reading, and that knowledge of content is developed through problem solving.

Cummins' theories (2001) consist of four hypotheses that discuss two forms of language developed in the acquisition process involving assessing a student's level of academic language. bilingualism and the theories of L2 acquisition and learning related to adult, presented by Krashen's 1999; 2000 & Cummins' 2000; 2004, for example, Krashen (1999, 2000) distinguishes between acquisition (involve understanding and communication) and the learning (meta-cognition) processes; Krashen (2000:132) argues that acquisition processes are more critical than the learning processes. According to Byrnes (2004:37):

> Language acquisition is essentially described as "more" and "better" incorporation of various separate attributes that make up language performance. Those attributes include, most particularly, grammatical and lexical accuracy, fluency, and also complexity, as well as sociolinguistic and pragmatic competence within a cultural context.

The work of one linguist, researcher Jim Cummins, was particularly relevant to the goals of this study. Cummins has focused on language acquisition in bilingual children. His research began with a study conducted in 1979 that was based on the earlier work of Swedish scientist Skuthabb-Kangas Toukomaa (1976). Following

Cummins' (1999) suggestion, as research-based theoretical principles, these hypotheses constitute a very good starting point for addressing questions regarding language of instruction in educational settings in Algeria. These principles suggest that: much of students' education in the early years is best conducted in MSA which extends up until the end of the elementary years. A description of Cognitive Academic language proficiency in higher educational environment clearly indicates that there are distinct linguistic abilities among learners. Cummins (1992:17) states that:

BICS was defined in terms of "the manifestation of language proficiency in everyday communicative contexts" whereas CALP was conceptualized in terms of the manipulation of language in decontextualized academic situations.

This includes abilities, motivation, attitudes and learning strategies. Research on learning strategies indicates that a student's performance could be improved by following certain strategies mainly code switching, but the results are highly dependent upon the nature of the task and differ between learners.

A number of researchers have drawn on characterizations of the specific characteristics of scientific discourse to provide an account of how students learn to think scientifically that embraces the view that thought and language are intimately intertwined. From this perspective, coming to think scientifically involves the appropriation of the ways that scientists use language. For example, scientific language differs from everyday language use in the distinctive clustering of certain linguistic features, among these features are reified and expressed via abstract nouns, verbs are reserved for expressing causal and logical relations between processes, and noun phrases become very complex (Halliday, 1993a). In addition, scientists also think and use language in distinctive ways when they are exploring new ideas. This thought and language is interpretive, involving metaphor, analogies and used in conjunction with the exploration of internal mental images and external diagrammatic representations.

This perspective has been useful in conceptualizing differential achievement among students with different backgrounds. This perspective has also clarified that in addition to the challenge of acquiring a new way of thinking, appropriating scientific discourse also involves the adoption of a different identity. Recognizing that learning science can also involve a transformation in identity has helped clarify why differential student achievement can be linked to sociocultural contexts where attitudes towards language and scientific ways of speaking vary significantly (Gee, 1990, 2005).

3. Data and Result of the Research Work

This chapter presents an analysis of language proficiency and academic achievement. Our investigation was conducted on the Medical Sciences students in three faculties of Tlemcen University (Pharmacy, Dental Surgery and especially the Faculty of Medicine) to determine the level of acquisition of French academic

proficiency in the 2012/2013 academic year. This research draws on data and theoretical results of a bilingual questionnaire, interviews, classroom observation and note- taking about students' speech performance, which allowed for the testing of language dominance along with the constructs of BICS and CALP. As already mentioned, our issue concerns the students' behaviour and reactions towards French used as a medium of instruction in those scientific streams. The sample consists of 100 students observed over a three-month period (from January to March 2013). They offered us the opportunity to gather their views about language practices and their academic achievement. The samples were selected according to the following criteria:

> Good average on the Baccalaureate exam
> High number of participants from Grade 1 to medical Residency
> Grade 6 and residents in medicine from the Faculty of
> Medicine were chosen for the following reasons:
> They represent an important stage which requires more opportunity to foster language learning and to develop Cognitive Academic Language Proficiency (CALP) (Cummins 2004).

In these grades learners have had sufficient exposure to both the French language and content knowledge of the field. Ten students interviewed in an informal way, aimed at determining the learners' behavioural performance as well as their attitudes towards the language of instruction.

Although a good number of students were resident, the French language proficiency could be assessed in terms of the learners self-reported and behavioural language performance by asking them questions on whether they are able to:

- use appropriate register for the task
- Employ concepts and terminologies correctly
- demonstrate richness and logical flow of thought and argument
- Acquire ease of oral expression
- Give correct responses

We attempt to diagnose the language learning situation by paying more attention to the students' verbal repertoire and the main obstacles they complained about and strategies which they follow or simply adopt to overcome linguistic incompetence. The method attempts to explore, describe, predict and explain the results obtained in the study setting with the goal of finding some answers to the proposed hypotheses.

4. The Questionnaire

This study evaluates the following three areas: students' language experiences associated with Language acquisition, Language use and language preference and academic achievement. Research shows that students' language learning and

language use experience and proficiency play an important role in shaping students' linguistic competence and behavioural performance. The questionnaire establishes on the basis of students' proficiency assessment and behavioural measures of language performance. Both quantitative and qualitative methods will be used in this research work, but we emphasize more on the qualitative one. Our aim is to describe individual experiences and their cognitive academic language proficiency, to obtain specific information about participants, to share their opinions and to see their behaviours in educational context. Thus, the questionnaire as a qualitative method, allow us to get more flexible information and to pave the way in our field-work to analyze the data.

Students' Language mastering (Fr vs. MSA)

Here is a table and then a graph representing the students' degree of mastering the two languages.

Q.1: Which language do you master better?

	MSA	French
Males N=50	43	7
Females N=50	30	20

Table 3.1 . Language mastering (Fr vs. MSA)

The graph below introduces gender-related results among medical sciences students; it shows the differences in terms of the mastery of the two languages. French is dominated and appreciated by girls while boys showed a higher level in MSA and a lower level in French in comparison to girls. Some sources (Dendane, 2007) view that female speakers in Algeria, especially in big cities, are more performant in French as this language appears to give them more social prestige and advancement.
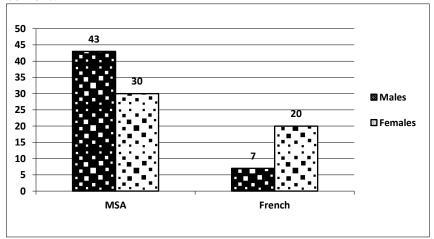
Figure 3.1. Language mastering among Medical Sciences students

As expected, MSA is the language that any educated Algerian student masters better than any other language, when we consider all of the 100 respondents, i.e. 73%. This is obviously due to the fact that Standard Arabic is the medium of instruction in Algeria at all levels while French is learned as a second language. However, 27% of the students claimed to master French better because they told us that MSA is hard to master; their linguistic behaviour is associated with the study language which enjoys high prestige due to its relation with modernity and opening to the world, and their positive attitudes towards French make them project to finish their studies abroad. However, on the whole, students' language behaviour confirms to a large extent our hypothesis that they are less proficient in French in comparison to MSA.

o **Students' Learning environments**

Students were asked about the learning environments contributing effectively to the attainment of second language proficiency. We have shed light on those activities that are considered crucial in order to understand the development of L2 learning and language proficiency.

Q.3: Please select the environments that have contributed to your French language learning ordering your choices from the most effective one?

	Family	University	Work	Reading	TV	Internet	Self-instruction
Frequency	30	84	37	55	68	78	48

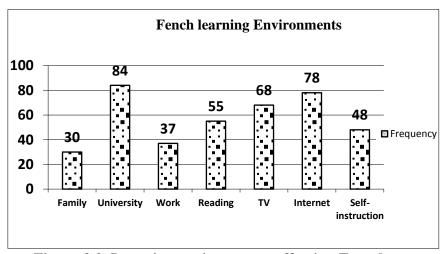**Table 3.2 . Effective Learning Environments**

Figure 3.2. Learning environments affecting French use

In fact, the data presented in the graph above show that students differ in the acquisition of French and these differences can be related to strengths and weaknesses in the development of L2 learning. The aim is to evaluate the acquired variety of language proficiency of students, particularly in oral performance.

These findings measured the way proficiency is attained and the way vocabulary is learnt and taught on the basis of language experience. There are different responses due to various factors affecting L2 attainment and linguistic knowledge which have an important role in language acquisition.

The main findings indicate that 84% of the students agree, to a great extent, that studies at the level of the university contribute to better language proficiency and offer a good insight in determining cognitive models; 78% of them consider the Internet as an important evidence that facilitates the development of second language proficiency. Other results show that 68% of the main effect of lexical knowledge for participants is obtained from TV programs while 56% of the responses reveal that reading also has a significant effect of gaining proficiency level. However, the difference between self-instruction (48%), work (37%) and family (30%) fails to reach significant effect on the acquisition of L2 learning. In the context of our results from a sociocultural view of science learning, we find discontinuity between scientific language and everyday language (respectively, CALP and BICS in Cummins' terms, 1979 and 2001).

Students' linguistic behaviour can be partly due to other factors mainly their different attitudes, motivations and educational backgrounds they have towards French which clearly affect their language use and preferences.

- o **Students' French language use**

The informants were asked to rate frequency of using French from 'always' to 'never'. The results of this question are very significant for our hypotheses, as shown in the following:

Q.4: Rate your frequency of using the French language in your daily speech and your university classes?

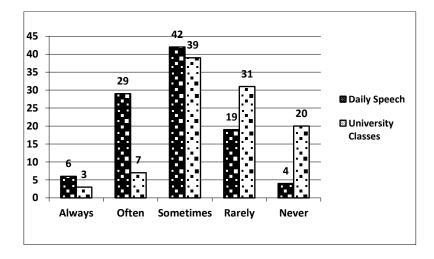|	Always	Often	Sometimes	Rarely	Never
Daily Speech	6	29	42	19	4
University Classes	3	7	39	31	20

Table 3.3 . Frequency of students' French use

Figure 3.3. Frequency of students' French language use

The results of this question can be significant for our study of types of language proficiency that we were trying to obtain, BICS vs. CALP. Since we have tried to determine students' attitudes and conversational fluency on everyday use, they were asked to rate the use of daily speech from 100% to 0%, i.e. from 'always' to 'never'. As expected, the results show that in daily speech, students often use French expressions which confirm their competence in conversational fluency and their positive attitudes towards the target language.

As we were expecting, the results show that the students' verbal repertoire is full of French, which can be explained by the fact the BICS is acquired, and students sometimes switch to French when communicating in a normal conversation inside and outside university classes. But what is noticed on the other hand, is that students often use French, especially in relaxed situations or in daily speech much more consistently than in university classes where French is rarely or almost never used. This confirms the effect of their attitudes towards the language and the resulting use in relaxed situations (BICS) as opposed to incomplete competence in the constrained setting of the classroom (CALP).

The graph shows that the use of French reflects negative behaviour in university classes whereas only 3% said they always use French and 7% said often use French within classes. This is certainly due to the different degrees of proficiency they have in French and their different attitudes.

Mixing languages (AA/ Fr)
Q.5: Do you use Arabic expressions in your French when speaking in classroom?

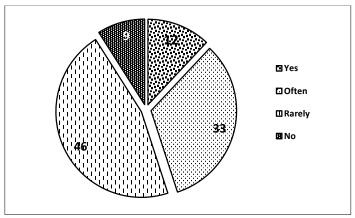|	Yes	Often	Rarely	No
Medical Sciences	12	33	46	9

Table 3.4 . Degree of mixing languages

Figure 3.4. Degrees of mixing languages

Here, the results we obtained show that only 9% of the students (boys and girls) use French when speaking which indicates certainly their high level of proficiency in French. However, the split between students from rural and urban area was significant in terms of French use, that is, the use of French is very restricted among students living in rural area, and 45% students told us that their L2 level is far from the average. Consequently, these students have difficulties in confronting with ALP once at university, because they were not so familiar with this language. Certainly learners' lack of the linguistic resources led them to rely on L1.

On the other hand, in urban families, French is more frequently used and children easily acquired French as second language. To know how much French is used in the life of students, we have asked them which language they use when speaking with relatives and friends. These students communicate only in that code and they are pragmatically constrained to switch to AA even if their competence level in French is high. AA is the language used in the daily speech of Algerians, but let us see the degree of French use in students' educational life.

The results show that 46% of the respondents said they rarely use Arabic expressions in their French when speaking in the classroom, while 33% say the opposite and confirm the natural order in L2 acquisition of language items (krashen,1978) for using free speech or ill-formed structures which emerge in L2 due to the mixture of the two languages and lack of French language mastery. The structure of language is extremely complex and we can be sure that our students are

exposed only to a small part of the total grammar of the language, and we know that even the best students do not learn every rule they are exposed to.

Focus on form. To use the Monitor effectively, time is not enough. The performer must also be focused on form, or thinking about correctness. Even when we have time, we may be so involved in what we are saying that we do not attend to how we are saying it.

Proficiency in the four skills

To evaluate students' language degree of proficiency in the French language, the following question was asked to self-evaluate competence in French from very good to weak in order to determine how they assess their different skills in French.

Q.7: Please evaluate your competence in the French language?

Speaking			
Very good	Good	Average	Weak
11	27	57	5

Table 3.5.1. Students competence in French (Speaking)

From this graph, we can encounter students with good and very good competency in understanding and reading skills, while the rest have an average level in these skills.

The results show that students, of different proficiency levels, will encounter difficulties to formulate oral or written production. The smooth process of production is disrupted with more information leading to performance that is more complex, students try to find the alternative methods of expressing their meanings, or using AA as a resource where normal communication can proceed.

As far as the receptive skills, understanding and reading, we have obtained the following results:

We can observe that students' answers are more positive as far as receptive skills are concerned, and we can encounter most students with good and very good competency in listening and reading skills while some have an average level in these modalities.

What is attractive in the results is that the students have on the whole an average level of proficiency in productive skills while they seem to perform better in the perceptive skills. According to Krashen (1983: 27), the child is building up competence in the second language via listening, by understanding the language around him. In accordance with the input hypothesis, speaking ability emerges on its own after enough competence has been developed by listening and understanding.

As a matter of fact, research in SLA has shown that productive skills are usually harder to develop than listening and reading. The results confirm our hypothesis that the vast majority of students in Medical sciences show little confidence conducting

oral presentation in the French language though they are quite proficient in productive skills particularly speaking that is why they have difficulty confronting with the academic language demands in lectures

- **Students' language difficulty**

We have attempted to look at the extent to which the informants find difficulties in pursuing their studies in French.

Q.8: Do you find difficulties in pursuing your studies in French?

	Yes	A bit	No
Medical Sciences	17	60	23

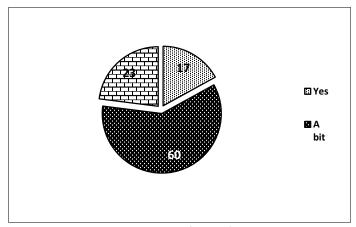*Table 3.8: Students' language perception in terms of difficulty*

*Figure 3.8: Students' language perception
in terms of difficulty*

The table and the graph show that there are a considerable number of students in medical sciences who face language problems in their studies, which confirms their low skills in French and lack of academic language proficiency. This is due to their pre-university schooling in MSA with French studied just as a foreign language; obviously, this mismatch affects students' linguistic abilities in scientific fields which are undertaken in French. All students' past language experience has shaped the way they behave linguistically today. They generally find difficulties in eliciting the information which has an impact on performance; in other words, the type of information has a strong influence, with concrete information being easier to handle with greater familiarity than abstract information which is associated with higher levels of accuracy and fluency and greater organization and structure in the task of performance. For instance, we have identified difficulties in the learners' spoken communication by examining their CALP when defining *l'hypertension artérielle*

(HtA) (arterial hypertension); how students use the scientific concepts to explore the meanings given to this word. Student says: *La tension est une maladie chronique et ses complications sont mortelles (tension is a chronic illness and its complications are fatal);* this analysis provides an important instance of limited knowledge in the subject matter and language difficulties while defining , interpreting or analysing the concept. So, it is not easy for students to sustain a conversation in French and difficulties may be expected at all stages. When doing role-playing, learners most frequently recite what they have heard previously; even if they know the answer, they may not provide their own explanation in an academic style, as in: *l'hypertension est définie comme étant une pression artérielle augmentée de manière chronique (Hypertension is defined as an arterial pressure increased in a chronic manner).*

As a matter of fact, students need to know how to analyse, synthesize, and other features such as evaluation, critical thinking and interpretation, which was not easy for them as our investigation has revealed. Students have developed a surface-level conversational fluency but not the deeper level of cognitive academic language proficiency. The demands in academic and scientific knowledge, with all the complexity and diversity, require a combination of deeper knowledge and thorough understanding of a fundamental and demanding discipline, such as medicine.

A variety of factors have been thought to be related to second language acquisition success or failure of students in their studies, including socio-political factors, the degree to which students are motivated or open to the amount of comprehensible input they receive and understand, and the strength of the affective filter, different measures of exposure to the second language, and the age of the learner.

4. Results

It is obvious that the language of instruction deeply influences the students' verbal repertoire. Students' proficiency in French ranged between intermediate and low. In bilingual conversation, discourse participants often mix or alternate codes mainly because medical themes and medical scientific terminologies are available only in French.

We have observed that their speech is full of code switching. However, this does not happen in all situations, as, sometimes, certain advanced residents use only the French language in lectures and medical examination. Other students communicate only in French even if their competence level in that code is low. The students' major reason for code switching observed in classroom environment and in relevance to teachers and students' interactions can be listed as follows:

Express a concept in French that has no equivalent in the Arabic language
Reinforce or to clarify a point by code switching.
Fill in the stop gap with words in AA in order to ease tension and maintain the fluency of the conversation.
Overcome the deficiency in language competence in French.

It is observed that many students do not communicate effectively in medical practice though they show positive attitudes towards the target language. This has been consistently supported through all the data.

Ten professors in Medicine were interviewed so as to know their opinion on students' language proficiency and academic achievement. All teachers agree that the students' language level was extremely low due to the Arabized Education (the sample students have gained their primary education in MSA). Consequently, they find obstacles to cope with academic demands in French. Several teachers said that in scientific disciplines, students have not an excellent command of the target language and they are unable to communicate in an effective manner during the lectures. They said that girls are more fluent than boys and few of them are able to introduce new vocabulary but they are accustomed to repeat the same words. One professor said that many students "swallow and recite perfectly. They do not "build" their courses."[1]

Students face difficulties acquiring the language of science and a minority may answer questions and give clear responses in French. They also said that they sometimes clarify and explain things in dialectal Arabic and not in MSA. When students notice their errors they do not correct them in French but they mix languages or switch to Arabic in order to be understood, as one professor says "charabia". The advanced residents are able to use the appropriate register for the situation but the new students in the field have a difficulty to communicate in French.

The teachers assess their progress in the target language through their oral performance and through the written form. The majority of students avoid participating to scientific debate because they master neither the language nor the content of knowledge.

Interesting data were gathered about the oral competency of the interviewees. Students say that when they abandon the oral performance, they use other communicative strategies, mainly code switching between the two languages (AA and French). Others say that they could speak best in darija (dialectal form) as opposed to French, or they stop talking; when they made mistakes, they correct themselves or they indirectly appeal for help from their teachers or peers. It is interesting to note that while most interviewees speak better *darija* than French, but speak better French when compared to MSA in conversational settings. They generally avoid participating in the orally in front of their teachers and classmates because they lack confidence and knowledge of French; so they are unable to carry out academic discussions and to make oral presentations outside class unless they prepare themselves beforehand. The majority does not talk in French outside the university classes and they consider those who use French as showing off.

Some students showed negative attitudes towards French as a language of instruction and they responded negatively, but after careful probing, they clarified

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[1]My translation of the French original text: *"avalent et récitent parfaitement. ils ne construisent pas leurs cours"*."swallow and recite perfectly. They do not "build" their courses."

that their negative answers were associated with their insecurity in speaking the language. Other respondents thought that students who use French in places beyond the university classes only want to impress other people with their competence in the language. But at the same time, they perceived that these French users have difficulty in communicating using appropriate registers in lecture contexts.

Results indicate that because medical sciences students interviewed had received an Arabized education, they lag behind French academic achievement, a lag often attributed to delay in the development of Cognitive Academic Language Proficiency (CALP). Research on students who are learning science through the medium of a second language (Cummins 2001) has produced a more specific understanding of this achievement gap.

Many factors affect learning languages, which might be the outcome of socio-political factors, language exposure, social enclosure, parental involvement and age, besides other factors, motivation and attitudes play a significant role in using or rejecting the language. Most of the students have specific motivations towards the language of instruction and might encounter problems in learning, particularly in medicine, when they do not have positive attitudes toward the study language. This work analyses the diversity in styles of communicative interactions between everyday speech and scientific style. In this work, it is suggested that students who are learning science in French learn at the same time to use the language of science which is quite different from everyday language.

The goal of this study was to investigate differences in students' attitudes towards French by focusing on gender, level, and language experience, language users. The findings show that gender has a significant effect on students' attitudes towards the study of French; indeed, we have found that female students have more positive attitudes towards French use. Further it was revealed that students' proficiency level has a significant effect on their linguistic achievement. Likewise, language experience has a significant effect on students' attitude to the study of French. Francophone students indicate a much more positive attitude to the study of French than their Arabophone counterparts. As a matter of fact, the respondents suggest their positive attitudes towards the French language users. Most students may have high regard for them and they believe that those who speak this language may belong to the elite of the society.

Within the world of language use, students have negative attitudes towards those who switch codes; they perceive code-switching in terms of lower status, a strategy used by weak students to compensate for language deficiency, though there are many students who find difficulties in their studies because of their weaknesses in French.

A small body of research has considered this issue of code- in relation to the learning and teaching science. Code-switching was the most notable strategy that students used to achieve a number of communicative and metalinguistic ends, mainly in the classroom context. Students have recourse to switching between languages (AA/ Fr) to convey their ideas, a strategy which allows them to draw on useful sense-

making resources. As an illustration, we may consider a discussion held between a teacher of internal medicine with residents producing examples of code-switching.

Code-Switching has a number of functions which vary according to the topic and the context. It is found that in medical sciences both teachers' and students' major reason for code-switching is that there is no direct translation of words between French and Arabic; they also use code-switching to ease tension in conversations. Code-switching is a strategy that students use to find the equivalents in Arabic to overcome the deficiency in language competence and to maintain the fluency of the conversation in order to eliminate any misunderstanding in the communication. No matter how this might be disruptive during a conversation to the listener, it suggests that these deep rooted attitudes towards language use may not be easy to change.

5. Conclusion

Despite a complex multilinguistic environment, education is carried out in Algeria in the absence of research-based policies and recommended practices. This research has made an initial attempt to motivate empirical investigations that, if carried out, would begin to inform policy and guide teaching practice. The goal is to motivate these investigations by discussing relevant empirical studies in light of research-based theoretical principles emerging from research conducted elsewhere and the nature of the multilinguistic contexts of the state. In light of the research-based principles that have emerged from the bilingual education literature, the linguistic specificities of learning and the multilinguistic nature of the language situation in Algeria and to understand the current cultural and linguistic problems in Algeria, it is necessary to have a short glance at the different periods of language evolution. We need to focus on the status and the effects of Arabic, French and the English language in the educational setting. The outcome of the present linguistic situation is difficult to predict due to the contrast between policy and reality concerning the level of learner's linguistic incompetence in both their L1 and foreign languages. In this current climate, the sociolinguistic future of Algeria is ambiguous; we are heading for a linguistic catastrophe.

Following Cummins (1999), it is important to point out that the results of empirical investigations will only be useful to inform practice beyond the particular contexts in which the studies are carried out if they are first guided by theoretical concerns and theory is central to the interpretation of the body of empirical findings that emerge. Given the diglossic nature of Arabic and the increasing use of the French language in science education in Algeria, the absence of an organized knowledge base to inform decisions regarding language in education, this will mean that quality of education will remain elusive. With this at stake, a sustained effort at producing a coherent, theoretical and empirically-based understanding of the relevant learning principles is urgently needed.

In sum, in considering issues of language allocation for education in Algeria we need to develop our understanding in a number of areas. We need to develop an understanding of the time it takes students to develop CALP in languages, in this

particular linguistic context. It is important to understand how the fact that the foreign language is not the language of the community and that students' native language is a local dialect impact the development of CALP in the languages of instruction. Moreover, the multilinguistic context of education in Algeria, including diglossia, suggests the need to clarify the conditions for achievement of the threshold of dual language competence beyond which there are no negative cognitive consequences. More ambitiously, conditions of positive effects of bilingualism need to be understood for the design of more enriched science teaching and learning environments.

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