Language of Instruction and Student Achievement in Moroccan High Schools: Perspectives Towards Trilingual Education

Mina Moudden, Lalla Asmae Karama

Ibnou Zohr University, Faculty of Letters and Human Sciences, Agadir, Morocco

ABSTRACT

Despite the myriad of studies on teaching foreign languages in Morocco, little research has been conducted to examine the perceptions of both teachers and students about trilingual education in Morocco. This study aims to examine how the integration of foreign languages has been perceived. It also assesses the extent to which trilingual education has been applied and received in the Moroccan context. This study mainly investigates the effects of the language of instruction on students' performance in Moroccan high schools. Using a quantitative design, questionnaires were administered to 18 EFL teachers, including science teachers and teachers of languages in the Moroccan setting, and 88 high school students. The data were collected via online questionnaires and analyzed through descriptive statistics using frequencies and percentages. The results show that Moroccan students and teachers exhibit positive attitudes towards the English language as an integrated foreign language in the Moroccan system, despite the emphasis on French as the main language of science. The results also showed a strong preference by students and teachers for English over French as a language of instruction for science. The findings indicate that students' comprehension and academic progress in science education are affected by their linguistic proficiency. The investigation highlights the need to improve teacher training, reconsider language teaching policies, and improve classroom teaching practices to support trilingual education in Morocco.

Key Words: Foreign languages, Morocco, Education, Language of instruction

INTRODUCTION

In Morocco's multilingual educational system, the language of instruction plays a crucial role in the success of students and their academic performance. Colonial and Arabization policies have historically affected Moroccan teaching guidelines and language instruction. However, Moroccan education is not only a multilingual system now, based on the strategic vision 2015-2030, but also a trilingual education system. This system integrates English as a language of science. Morocco presents a complex landscape of languages that includes Arabic, French, and English as developing foreign languages (Ennaji, 2005). Learners' attitudes toward these languages vary between seeing them as bridges or obstacles (Pennycook, 2001). Students' achievements depend not only on the context but also on the language of instruction. In the Moroccan settings, numerous students face challenges when transitioning among languages across subjects. Therefore, this study investigates the effect of the language of instruction on the achievement of Moroccan high school students by surveying students, science teachers, and teachers of languages.

LITERATURE REVIEW

English as a Foreign Language in Moroccan Education

The English language is widely recognized as the global lingua franca in the Moroccan system, and it is spoken by a number of Moroccans. It has gained serious attention due to the growing importance of English worldwide. In the Moroccan education system, students in public schools begin learning English only in the third year of middle school and at the high school level. However, it is taught at primary levels in private schools.

 "Upon receiving a directive from the Minister of Education, we fast-tracked our plans to introduce English learning in middle schools, bringing about a significant shift in our educational approach," said Director of Curricula, Mohammed Zerouali in an interview with Hespress English. The new plan aims to improve students'

foreign language (FL) proficiency and mastery by using French and English to teach scientific subjects: math, physics, and life and earth sciences at the secondary level, instead of the official language, Arabic.

The move, based on Mohammed Zerouali, director of programs at the Ministry of Education, aims to provide **"equal opportunities"** between private and public schools, where English is already taught at the primary level. In May 2023, an educational initiative was presented by Aziz Akhannouch's government that intends to introduce English to 100% of students in the first, second, and third years of secondary school by 2025-2026. That is to say, English is expected to be the main language in many subjects, just as French is today. The Ministry of Education plans to carry out this project in a **"progressive and balanced manner"**. The implementation of this new government decision will proceed as follows: English will be introduced with a coverage rate of 10% in the first year of secondary school in 2023-2024, and 50% in 2024-2025. During the 2025-2026 cycle, it will be implemented 100% and fully generalized by 2026. Each class will receive two hours of English instruction per week, and teachers will be responsible for 12 classes.

Arabization and French in the Moroccan System of Education

It is well known that Morocco once had a traditional education system based on Islam. At the center of these schools' curricula were memorization of the Quran, as well as learning basic literacy (Ennaji, 2005). After colonization, the French language was used in Moroccan schools, especially since they built schools in which the language of instruction was French. From 1912 to 1956, Morocco was governed as a French protectorate, and as such, the French gained elevated status in the country (Zouhir, 2013). In 1956, with Moroccan independence, many changes happened in the Moroccan education system. The main change was the launch of the project of Arabization to unify the Arabic language, the Moroccan system, and people as well. These changes faced much criticism when Mohammed El Fassi, the first Minister of Education in independent Morocco, attempted to Arabize the 'le cours préparatoire'. Much of this criticism came from Amazigh leaders who felt threatened by Arab nationalism and saw the Arabization project as an attempt to diminish the use of their language in Morocco (Marley, 2004). Accordingly, in 1965, the Minister of National Education decided to stop the project of Arabization and to restore the French system of education instead (Ennaji, 2002). In 1970, the ministry refused to implement French in teaching exact sciences in the secondary school system and instead gave priority to Standard Arabic. In the 21st century, in 2016-2017, the former minister Rachid Belmokhtar enforced the obligation to teach scientific subjects at the common core and first bac levels in French. The 2015-2030 Strategic Vision insisted on the use of the French language in Moroccan public schools. The ministry also launched a program titled "Enhancing Quantum in Foreign Languages". In 2019, the ministry continued to insist on teaching scientific subjects in French.

METHODOLOGY

Research Objectives, Questions, and Hypotheses

This study seeks to address the following objectives:

RO1: To explore the students' and teachers' attitudes towards the English language as an integrated foreign language in the Moroccan system.

RO2: To investigate the effect of the language of instruction on the achievement of Moroccan high school students.

The study under investigation seeks to answer the following questions:

RQ1: What are students' and teachers' attitudes towards the English language as an integrated foreign language in the Moroccan system?

RQ2: Does the students' performance get affected by using Arabic, French, and English?

The research hypotheses deriving from the above research questions are:

RH1: Students and teachers exhibit positive attitudes towards the English language as an integrated foreign language in the Moroccan system.

RH2: Students' comprehension and academic progress in science education are affected by their linguistic proficiency.

Instrument

A quantitative questionnaire was used to assess the attitudes of Moroccan teachers and students toward the language of instruction in the Moroccan education system. An online questionnaire was administered using Google Forms. The three questionnaires are described in detail in the following paragraphs. The types of questions on the three instruments included yes/no questions and items that required participants to rate their level of agreement using Likert scales: 1) Strongly agree; 2) Agree; 3) Neutral; 4) Disagree; 5) Strongly disagree. Questionnaires and agreement scale tests have routinely been utilized over the past several decades in psycho-sociolinguistic studies and have yielded valid and reliable results (Bentahila & Davies, 1983; Saidi, 2001). The questionnaires were proofread, validated through peer review, and pilot-tested for clarity. Voluntary participants were informed of the study's aim. The questionnaire was shared online with science and language teachers via social media platforms in the form of a QR code or a link.

High school students' questionnaire

The high school students' questionnaire was divided into three main parts. The first part contained questions regarding biographical information such as sex, age, region, and home language. The second part examined students' attitudes towards their competence in Arabic, French, and English. The third part asked about their views on the language of instruction in science disciplines.

Science teachers' questionnaire

The science teachers' questionnaire was divided into four main parts. The first part gathered demographic data such as sex, age, region, and educational experience. The second part dealt with teachers' competence in mastering Arabic, French, and English. The third part examined teachers' attitudes towards the language of instruction and the changes connected to adopting different languages as tools of science instruction. The final component examined teachers' views on the future status of foreign languages in Moroccan education.

Teachers of languages' questionnaire

The language teachers' questionnaire was divided into four main parts. The first part gathered personal information, including sex, age, region, and educational experience. The second part dealt with teachers' competence in Arabic, French, and English. The third part examined teachers' attitudes towards the language of instruction and the changes in adopting different languages in scientific subjects rather than in language teaching. The fourth component examined teachers' views on the future status of foreign languages in Moroccan education.

Rationale

The instrument used to obtain data is relevant to the topic and nature of the research project. The questionnaire was carefully designed to collect both nominal and quantitative data. Moreover, the questions in this instrument aim to ensure validity and reliability as two major requirements of a research paper. Moreover, a questionnaire has other advantages, such as being practical, cost-effective, and having standardized answers that make it simple to compile data. More importantly, it takes a short time to complete, which can encourage participants to provide reliable responses.

Data analysis:

The data were analyzed using Jamovi statistical software, version 1.6.23.0. Jamovi was used because of its simplicity in handling questionnaire data. The data gathered were analyzed using descriptive statistics, including frequency tables and percentages.

THEORETICAL FRAMEWORK

This study adopts a social constructivist approach that sheds light on the role of language in social interactions that shape individuals' understanding and knowledge construction (Vygotsky, 1978). According to social

science studies, social constructivism is an effective theory to adopt in this study. Constructivism deals with individuals and how they construct their understanding of reality. In this context, attitudes refer to "feelings, thoughts, or actions toward a phenomenon" (Sapsford, 1999). In this case, it refers to the use of language by both the students and teachers in Moroccan high schools. Social constructivism sheds light on learning in social contexts. The experiences of science teachers, language teachers, and Moroccan high school students are crucial to this investigation. This study is mainly about the interaction between Arabic, French, and English in the Moroccan education system. Thus, surveying teachers and students is an appropriate method for examining the effect of language of instruction on the achievement of Moroccan high school students.

Participants:

Concerning sampling, the population of this research paper is made up of teachers serving in Moroccan public high schools, including science and language teachers. The survey is also devoted to high school students.

In this study, 88 students were surveyed. Forty-eight students were randomly chosen from Life and Earth Sciences courses in the second year Baccalaureate level. Moroccan students spend three years in secondary studies at the high school level. The first year equips them with basic courses and then proceeds by completing first-and second-year baccalaureate courses. Choosing 2bac students purposefully selected based on being in touch with Arabic for 12 years, English for 6 years, and French for 11 years, and second-year baccalaureate students graduate to university the following year. Forty-one students were male, while forty-seven were female. Their ages ranged from 16 to 19 years old. The gender distribution shows a higher participation rate among female students (53.4%) compared to male students (46.6%). This might reflect the availability of female students, their interest in studies, and completing the given tasks by their instructors. It may also refer to the demographic trends in Moroccan public schools. It might indicate female students' interest in language mastery and future linguistic favorites.

Responses were also collected from 18 teachers; 8 language teachers and 10 science teachers. Among language teachers, 50% were aged 30-45, 25% were aged 21-30 (representing novice teachers), and 25% were over 46 years old with experience. However, 60% of science teachers' ages ranged from 21-30, which represents novice teachers, and the rest represent 40% of 30-45. It is vital to mention that age plays an elusive role in language learning attitudes. Thus, the variation of gender is clear from the mentioned statistics. The statistical findings suggest that younger teachers are more open to innovation and integration of languages in science education.

Concerning teachers' qualifications and teaching experience, the educational level and years of experience show an impressive profile. For the language teachers, a combined 75% of teachers held either an MA or PHD, with 37.5% holding each. A small number of participants held a Bachelor's degree (12.5%) or a professional diploma (12.5%), and the rest did not hold a post-doctoral degree. A percentage of 37.5% have 5-10 years of experience, 37.5% have more than 10 years, and 25% have 1-5 years. For scientific teachers, 40% hold a PHD diploma, another 40% have a master's degree, and the rest have a professional diploma with no selection against of post-PhD degree. The responses showed that a percentage of 70% had 1-5 years of experience, 20% had more than 10 years, and 10% had 5-10 years. This represents a clear balance of teaching, training, and expertise when it comes to teachers of languages. Reaching the mentioned diplomas indicates the well-prepared for being bilingual or trilingual and teaching using the integration of languages. For scientific teachers, it may be noticed that they are open towards integrating different languages since they are novice teachers and have gone through experiences of being trained using various languages in their educational careers.

RESULTS

Data presentation

High school students' attitudes

The results of the survey administered to high school students are presented in this section. In general, the outcomes are divided into three parts: students' self-assessment of their competence in foreign languages; their views on the language of teaching in science disciplines; and their perspectives toward the use of foreign languages in Moroccan education. The views of students towards mastering foreign languages have a significant impact on their usage in the classroom. The following part presents individual questions and responses gathered

through the questionnaire.

High school students' attitudes: discussion

Appendix 1 includes grouped responses related to high school students' attitudes. Concerning high school students' attitudes regarding their proficiency in foreign languages, most students rated themselves as average, with a percentage of 50.6%, 27.7% as good, 15.7% as weak, and the rest with very weak proficiency in French. For English proficiency, a higher percentage of 40.9% rated their proficiency as good and 43.2% as average. It is obvious noticed a shift towards the English language as a language confidence. Different variables may act as reasons behind this clear shift and the emphasis on English in the surrounding community. High school students, whether in science or humanities streams, interact with scientific subjects with different coefficients, and both languages are obliged to tackle in learning scientific subjects in the high school guidelines. Most students had positive attitudes toward bilingual science projects (45.5%), 10.2% had negative attitudes, and 44.3% had both positive and negative attitudes. There is no doubt that learners are aware of the benefits and challenges of being presented with bilingual content. Introducing the following question related to language barriers is important. Roughly 58 out of 100 agreed that they face language barriers, and around 44% did not face language integration challenges. Subject comprehension is visibly affected by language difficulties that remain a barrier for high school students. Being aware of the importance of languages, 54.5% of the students -representing a large number- agreed that French and English are languages of literature and science, 29.5% as a language of science only, and 15.9% as a language of literature only. Future life requires mastery of various languages, which leads to the question of the preferred future language. More than half preferred English, 21.8% chose Arabic, and 18.4% opted for French. English is the preferred language for future careers, and it dominates the international growth since it is a language of prospects.

When students are asked about their motivation towards learning languages without being obliged, the majority agreed that they would not care about French and English, and less than half saw the opposite. Intrinsic interest is lacking in respondents 'answers, and motivation occurs to affect language preferences. This finding matches the previously reported question, and the last two questions support this conclusion. The majority totally agreed with an average of 50% that English is the preferred language of teaching and learning science. Many disagreed that they would learn science better if it were taught in the French language.

The findings reveal that Moroccan high school students prefer English and have positive attitudes towards having science classes in English or Arabic integrated with English instead of French. The data show that most students would adopt English as the primary language of science. It is also noted that the complexity towards integration of integrating different languages in science courses. English is seen by Moroccan high school students as a tool for a good future career and effective teaching and learning processes. In spite of bilingual education challenges, students show a positive attitude and readiness towards multilingual learning. There is a need for changes in teaching science subjects, training and equipping instructors in using effective integration of languages, and modifications in the Moroccan high school guidelines.

Science teachers' attitudes

The questionnaire for science teachers included four parts. The first part collected personal information. The second part measured the proficiency level of teachers in mastering the three languages. The third part examined teachers' attitudes toward the language of instruction in Moroccan classes and what should be done according to pedagogical guidelines. The last part assessed teachers' attitudes towards the future status of the language of instruction in the Moroccan education system.

Science teachers' attitudes: discussion

Appendix 2 includes response rates for specific questions asked of science teachers who participated in the study by completing the survey sent. The first crucial question was related to teachers' language of teaching in Moroccan classes that are required in Moroccan guidelines: Arabic, French, and English. For science teachers, 50% use French, 20% use Arabic and French, another 20% use Arabic, and 10% opt for all three languages.

Science teachers rated their students' Arabic proficiency with 40% as very good, 40% as good, 10% as average, and another 10% as weak. Concerning their students' proficiency in the French language, they rated 20% as very

good, 10% as good, 30% as average, 10% as weak, and 30% as very weak. However, their students' English proficiency differs, with 0% as very good, 20% as good, another 20% as average, 30% as weak, and another 30% as very weak. Most teachers noted their students' level and showed a weak to average level when it comes to the French language, even though it is historically the language of science in Morocco. It seems from their teaching experiences that the majority struggle with students' lack of mastery of the French language. On the same path of French, they showed an underdeveloped situation of English in Moroccan classes despite its growing importance. However, it is obvious that students have higher proficiency in Arabic in comparison with other languages.

The following question is related to trilingual science instruction. In another way, it is related to their opinion toward adapting Arabic, French, and English in their teaching of science. Most science teachers, with an average of 70% agreed with teaching science in Arabic, French, and English;10% showed agreement; thethe two 10% reacted as disagreed and were totally opposed to the idea. Science subjects require tackling an amount of scientific material and explanation of the scientific content in the curriculum, which leads to facing several challenges. Science teachers indicated 'reading and explaining' with an average of 66.7% as a major difficulty,33.3% cited writing as the greatest challenge, and no one selected the last option "No difficulty at all". It is concluded that using multiple languages leads to facing various challenges in the Moroccan system. It is clearly noticed that the need for academic language training before or in parallel with teaching practices.

A majority of science teachers (66.6%) indicated that using scientific terminology created difficulties in instruction either very often or often. And a percentage of 11.1% rarely faces difficulties. When teachers were asked about the acquisition of science and whether it depends on their mastery of foreign languages, the results were as expected based on previous responses. An average of 66.7% agreed with the statement, which leads us to the conclusion that mastering languages is not separate from valid performance in scientific subjects. In addition to this finding, 88.9% of science teachers think that English should supplant Standard Arabic in scientific disciplines as the language of science.

The last part of the questionnaire required teachers to make a prediction about the future of both English and French in Moroccan education. 100% of teachers opted for the future status of the English language in Moroccan education. On the same vein, 88.9% of the teachers rejected the future status of the French language in Moroccan education.

The overall findings indicate that science teachers' attitudes towards the integration of languages are decisive towards the adoption of English as a language of the future. They express clear dissatisfaction with low proficiency in French. They call for ameliorating teacher training and mastery of languages as a crucial factor in the success of the teaching and learning process. The data also reflect broad encouragement of the integration of languages, mainly Arabic, French, and English, in the Moroccan educational system.

Teachers of Languages' attitudes

The survey administered to teachers of languages was divided into four parts. The first part was devoted to collecting the demographic information. The second part was concerned with language teachers' attitudes towards the language of instruction in Morocco. The third part examined students' abilities and interests in the integration of Arabic, French, and English. The fourth section examined teachers' views on the future status of language instruction in Moroccan education.

Teachers of Languages' attitudes: discussion

Appendix 3 Includes the response rates of specific questions asked of teachers of languages who completed the questionnaire. When teachers of languages were asked about the language used in their classes, 75% used English and French as the main languages, and only a few teachers used only Arabic, or Arabic integrated with English. It is worth saying that the findings indicate limited multilingual integration in Moroccan classes.

Respondents were asked to rate their students' proficiency in Arabic, French, and English as languages that are triangulated in the Moroccan teaching curriculum. Based on the data, the majority of the students have an average to good level in the Arabic language. This suggests the long experience of learning using the Arabic language and shows a positive effect of using Arabic on the comprehension of students. For the French language, a

significant percentage of 50% have a low level in French, which might affect the learning process; half have an average level, and there is a lack of reported high proficiency. Concerning students' proficiency level in English, over 80% are at average or high levels. This indicates a positive rate for its integration as a foreign language into subject teaching. It is clear that English is the strongest foreign language among the languages to be adopted.

Recognizing that other researchers (Oxford et al. 2008) have recognized strong connections between motivation and language learning, teachers were asked to describe their opinions on Teaching Scientific Subjects in Three Languages. Having positive attitudes towards single foreign languages or even mastering them doesn't directly mean adopting the idea of trilingual education because of various challenges. The majority (62.5%) are against teaching scientific subjects in Arabic, French, and English at the same time. The absence of motivation towards trilingual education is also likely because of practical or pedagogical worries. Teaching a foreign language for communication purposes requires applying many approaches, teaching perspectives and practices, but teaching a scientific content within a trilingual education requires many criteria that may be missing in Moroccan settings.

Questioning learning foreign languages through other subjects is a follow-up question that follows the same pathway of interpretation. A majority of teachers disagree that students can acquire foreign languages through non-language subjects. Language teachers deeply know the requirements of teaching and learning foreign languages and have also gone through the experience of bilingual education in their learning journey. The future of foreign languages in Moroccan education is not clear, as responses are 50% uncertain about its development, and the other half reflect the opposite. This finding simply highlights the barriers of language policy in Morocco.

CONCLUSION

It is obvious that trilingual education in Morocco faces numerous difficulties in its application. Various languages, mainly Arabic, French, and English, are used in Moroccan society. Students' studying journey includes different language policy changes, starting with learning scientific subjects in Arabic. Then, integrating French as a language of science, followed by opening the sight towards integrating both French and English with Arabic as languages of teaching. Even though the findings interpret Moroccan teachers' and students' attitudes towards trilingual education, French is still the dominant language. Bullock (2014) explains that French is still the dominant language of instruction in the faculties of medicine, engineering, science, technology, business, and management. The initiatives towards the integration of English also impact the perspectives of teachers and students. Such changes are not always easy to adopt, as Pennycook (2001) stated, ''pedagogic choices about curriculum development, content, materials, classroom processes, and language use…are inherently ideological in nature with significant implications for learners' socioeconomic roles'' (p. 115).

The perspectives of both students and teachers in this study draw attention to English as a global language. The majority of students have average or good levels of English and showed readiness to switch to English and stop struggling with the French language. It is important to note that the majority of Moroccan students surveyed have a weak level in French because of previous negative experiences in learning the language, which negatively affect their comprehension of science. Coupled with the finding that 90% of teachers surveyed see the use of English as an effective alternative to improve students' levels of science. Also, teachers have a positive attitude towards English as a language of teaching science even though 50% express uncertainty about the future of foreign languages in Moroccan education.

The expectation of this study's author leans towards opting for English as an alternative or additional language of education in Morocco and anticipates high proficiency in the English language. 95% of surveyed teachers see English and Arabic as viable languages of teaching in Morocco, based on their students' language proficiency and motivation towards policy changes. It cannot be denied that Morocco still depends on the French language in society and diplomacy, even though it gained its independence in 1956. On the other hand, the majority of students struggle with the French language and exhibit negative attitudes towards adopting it as a language of teaching, even though some minority students prefer it based on their good experiences in learning and acquiring French. Moreover, Morocco is increasingly aware of the need to integrate other foreign languages, mainly English, since it prepares students for future careers. It is clear the impact of English on language policy in Morocco. Thus, no one can guarantee the future status of languages in Morocco, and many views support the integration of English as a suitable alternative in the Moroccan education policy.

Appendix 1: High School Students' responses

Question 1: What is your proficiency level in French language?

What is your proficiency level in French language?	Fréquences	% du Total	% cumulés
Good	23	27.7%	27.7%
Very good	4	4.8%	32.5%
Very weak	1	1.2%	33.7%
Weak	13	15.7%	49.4%
average	42	50.6%	100.0%

Question 2: What is your proficiency level in English language?

What is your proficiency level in English language?	Fréquences	% du Total	% cumulés
Average	38	43.2%	43.2%
Good	36	40.9%	84.1%
Very good	5	5.7%	89.8%
Very weak	1	1.1%	90.9%
Weak	8	9.1%	100.0%

Question 3: How do you find the project of studying in French and English scientific subjects?

How do you find the project of studying in French and English scientific subjects?	Fréquences	% du Total	% cumulés
Has advantages and disadvantages	39	44.3%	44.3%
Negative	9	10.2%	54.5%
Positive	40	45.5%	100.0%

Question 4: Do you prefer English and French as languages of science, literature or both?

Do you prefer English and French as languages of science, literature or both?	Fréquences	% du Total	% cumulés
Both	48	54.5%	54.5%
Language of literature	14	15.9%	70.5%
Language of science	26	29.5%	100.0%

Question 5: Do French and English pose any problem in your learning of sciences?

Do French and English pose any problem in your learning of sciences?	Fréquences	% du Total	% cumulés
No	49	56.3%	56.3%
Yes	38	43.7%	100.0%

Question 6: What language do you prefer to use in your future life and job carrier?

What language do you prefer to use in your future life and job carrier?	Fréquences	% du Total	% cumulés
Arabic	19	21.8%	21.8%
English	52	59.8%	81.6%
French	16	18.4%	100.0%

Question 7: If I weren't obliged to master French and English, I wouldn't care about them

If I weren't obliged to master French and English, I wouldn't care about them.	Fréquences	% du Total	% cumulés
I agree	28	32.6%	32.6%
I disagree	32	37.2%	69.8%
I totally agree	11	12.8%	82.6%
I totally disagree	15	17.4%	100.0%

Question 8: I would learn sciences effectively if the language of instruction were French

I would learn sciences effectively if the language of instruction were French.	Fréquences	% du Total	% cumulés
I agree	30	35.7%	35.7%
I disagree	22	26.2%	61.9%
I totally agree	16	19.0%	81.0%
I totally disagree	16	19.0%	100.0%

Question 9: I would learn sciences effectively if the language of instruction were English

I would learn sciences effectively if the language of instruction were English.	Fréquences	% du Total	% cumulés
I agree	43	50.0%	50.0%
I disagree	16	18.6%	68.6%
I totally agree	16	18.6%	87.2%
I totally disagree	11	12.8%	100.0%

Appendix 2: Science Teachers response

Question 1: Which language (s) do you use to teach your subject?

Which language(s) do you use to teach your subject?	Fréquences	% du Total	% cumulés
All languages	1	10.0%	10.0%
Arabic	2	20.0%	30.0%
Arabic and French	2	20.0%	50.0%
French	5	50.0%	100.0%

Question 2: What is the level of your students in Arabic?

What is the level of your students in Arabic?	Fréquences	% du Total	% cumulés
Average	1	10.0%	10.0%
Good	4	40.0%	50.0%
Very good	4	40.0%	90.0%
Very weak	1	10.0%	100.0%

Question 3: What is the level of your students in French?

What is the level of your students in French?	Fréquences	% du Total	% cumulés
Average	3	30.0%	30.0%
Good	1	10.0%	40.0%
Very good	2	20.0%	60.0%
Very weak	3	30.0%	90.0%
Weak	1	10.0%	100.0%

Question 4: What is the level of your students in English?

What is the level of your students in English?	Fréquences	% du Total	% cumulés
Average	2	20.0%	20.0%
Good	2	20.0%	40.0%
Very weak	3	30.0%	70.0%
Weak	3	30.0%	100.0%

Question 5: Do you think students should study scientific subjects in three languages (Arabic, French, and English)?

Do you think students should study scientific subjects in three languages (Arabic, French, and English)?	Fréquences	% du Total	% cumulés
I agree	7	70.0%	70.0%
I disagree	1	10.0%	80.0%
I totally agree	1	10.0%	90.0%
I totally disagree	1	10.0%	100.0%

Question 6: To what extent do you agree with the statement: "Students' acquisition of sciences depends on their mastery of foreign languages"?

To what extent do you agree with the statement: "Students' acquisition of sciences depends on their mastery of foreign languages"?	Fréquences	% du Total	% cumulés
I agree	6	66.7%	66.7%
I disagree	1	11.1%	77.8%
I totally agree	1	11.1%	88.9%
I totally disagree	1	11.1%	100.0%

Question 7: Which language do you think should supplant Standard Arabic in scientific disciplines?

Which language do you think should supplant Standard Arabic in scientific disciplines?	Fréquences	% du Total	% cumulés
English	8	88.9%	88.9%
French	1	11.1%	100.0%

Question 8: What are your predictions about the future status of French language in Moroccan education?

What are your predictions about the future status of French language in Moroccan education?	Fréquences	% du Total	% cumulés
Declining	8	88.9%	88.9%
Developing	1	11.1%	100.0%

Question 9: What are your predictions about the future status of English language in Moroccan education?

What are your predictions about the future status of English language in Moroccan education?	Fréquences	% du Total	% cumulés
Developing	9	100.0%	100.0%

Appendix 3: Arabic Teachers responses

Question 1: Which language(s) do you use to teach your subject?

Which language(s) do you use to teach your subject?	Fréquences	% du Total	% cumulés
Arabic	1	12.5%	12.5%
Arabic and English	1	12.5%	25.0%
English	3	37.5%	62.5%
French	3	37.5%	100.0%

Question 2: What is the level of your students in Arabic?

What is the level of your students in Arabic?	Fréquences	% du Total	% cumulés
Average	3	42.9%	42.9%
Good	2	28.6%	71.4%
Very good	1	14.3%	85.7%
Weak	1	14.3%	100.0%

Question 3 : What is the level of your students in French?

What is the level of your students in French?	Fréquences	% du Total	% cumulés
Average	3	50.0%	50.0%
Very weak	2	33.3%	83.3%
Weak	1	16.7%	100.0%

Question 4: What is the level of your students in English?

What is the level of your students in English?	Fréquences	% du Total	% cumulés
Average	4	66.7%	66.7%
Good	1	16.7%	83.3%
Very weak	1	16.7%	100.0%

Question 5: Do you think students should study scientific subjects in three languages (Arabic, French, and English)?

Do you think students should study scientific subjects in three languages (Arabic, French, and English)?	Fréquences	% du Total	% cumulés
I agree	1	12.5%	12.5%
I disagree	4	50.0%	62.5%
I totally agree	2	25.0%	87.5%
I totally disagree	1	12.5%	100.0%

Question 6: Can students master foreign languages in other subjects rather than language subjects?

Can students master foreign languages in other subjects rather than language subjects?	Fréquences	% du Total	% cumulés
I agree	3	37.5%	37.5%
I disagree	5	62.5%	100.0%

Question 7: What is your prediction about the future status of foreign languages in Moroccan education?

What is your prediction about the future status of foreign languages in Moroccan education?	Fréquences	% du Total	% cumulés
Declining	4	50.0%	50.0%
Developing	4	50.0%	100.0%

REFERENCES

1. Azikiwe, A. (2014, May 19). Neo-colonialism and the changing nature of imperialism in Africa. Global Research. https://www.globalresearch.ca/neo-colonialism-and-the-changing-nature-imperialism-in-africa/5385713
2. Bentahila, A. (1983). Language attitudes among Arabic–French bilinguals. Multilingual Matters.
3. Bullock, S. (2014). Language ideologies in Morocco (Undergraduate honors thesis, Connecticut College). Anthropology Department Honors Papers, Paper 11. http://digitalcommons.conncoll.edu/anthrohp/11
4. Cobb, P. (1994). Where is the mind? Constructivist and sociocultural perspectives on mathematical development. Educational Researcher, 23(7), 13–20. https://doi.org/10.3102/0013189X023007013
5. Ennaji, M. (2002). Language contact, Arabization policy and education in Morocco. In A. Rouchdy (Ed.), Language contact and language conflict in Arabic (pp. 1–27). Routledge.
6. Ennaji, M. (2005). Multilingualism, cultural identity, and education in Morocco. Springer.
7. Khamees, K. (2016). An evaluative study of memorization as a strategy for learning English. International Journal of English Linguistics, 6(4), 248–259. https://doi.org/10.5539/ijel.v6n4p248

8. Kingdom of Morocco. (2015). Vision stratégique de la réforme 2015–2030: Pour une école de l'équité, de la qualité et de la promotion. Higher Council for Education, Training and Scientific Research. https://www.csefrs.ma/wp-content/uploads/2015/05/Vision_Strategique_Fr.pdf

9. Kövecses, Z. (2002). Metaphor: A practical introduction. Oxford University Press.

10. Lee, K. R., & Oxford, R. L. (2008). Understanding EFL learners' strategy use and strategy awareness. Asian EFL Journal, 10(1), 7–32. Pennycook, A. (2001). Critical applied linguistics: A critical introduction. Lawrence Erlbaum Associates.

11. Marley, D. (2004). Language attitudes in Morocco, following recent changes in language policy. Language Policy, 1(1), 25–46.

12. Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.), Handbook of research on teacher education (2nd ed., pp. 102–119). Macmillan.

13. Richards, J. C., & Schmidt, R. (2013). Longman dictionary of language teaching and applied linguistics (4th ed.). Routledge.

14. Saidi, R. (2001). The teaching of modern standard Arabic to Moroccan pupils in elementary schools in the Netherlands: A study on proficiency, status and input (Unpublished doctoral dissertation). Tilburg University.

15. Safdar, M. (2013). Meaningful learning and rote learning in physics: A comparative study. Middle Eastern & African Journal of Educational Research, 6, 60–77.

16. Sapsford, R. (1999). Survey research. Sage Publications.

17. Tashakkori, A., & Teddlie, C. (2003). Handbook of mixed methods in social and behavioral research. Sage Publications.

18. Vaidya, N. (1996). Science teaching for the 21st century. Deep & Deep Publications.

19. Vygotsky, L. S. (1978). Mind in society. The development of higher psychological processes. Cambridge: Harvard University Press.

20. Zouhir, A. (2013). Language situation and conflict in Morocco. In O. Orie & K. Sanders (Eds.), Selected proceedings of the 43rd Annual Conference on African Linguistics (pp. 209–218). Cascadilla Proceedings Project.