

**Perceptions of Teachers
regarding English-medium Instructions at Secondary
Education in Punjab Province of Pakistan**

Amna Saeed* & Tanveer Iqbal, Rabbia Azam**

Abstract

This study is designed to determine perceptions of students and teachers regarding English as medium of instructions. The research consists of a questionnaire survey. The sample for the survey involved 200 teachers from rural and urban Secondary schools of Punjab province, Pakistan. Stratified Random Cluster sampling method was implemented to choose schools for the survey. Teachers of secondary school were chosen randomly for sampling. This survey questionnaire contains 5 point Likert scales. To analyze quantitative data, descriptive statistics, one-way ANOVA and bivariate correlations was conducted.

Key words: English-medium instruction (EMI); Perceptions of Secondary School Teachers; Attitudes toward English.

*PhD Scholar, Institute of Education and Research, University of the Punjab, Pakistan
Email: amnanadeem86@gmail.com

**PhD Scholar, Institute of Education and Research, University of the Punjab, Pakistan
Email: tanveer_242@hotmail.com

***Research Scholar, Institute of Education and Research, University of the Punjab, Pakistan

Introduction

Nearly all private and public schools use English medium of instructions for science subjects in Punjab Province, Pakistan. As English is foreign language in Punjab, It is difficult for teachers and students to understand concepts in this language. It is considered that English language is essential for progress in science and technology as well as in higher education. Therefore this research is undertaken to determine the perceptions of teachers and students about English medium instructions for teaching Science.

After World War Two, English appeared to have spread and become more evident due to sociopolitical and economic factors affecting the society. In addition to spreading in colonized parts of the world, English began to dominate in non-colonized areas and ultimately it has developed as world-wide *lingua franca*, English has become common language for communication among people whose first languages differs from each other (Holmes, 1997). One of the main characteristic of English language is that it has prevailed in international business, diplomacy, commerce, education, science and technology, popular media, in the twentieth and twenty-first century (Fishman 1992; Master, 1998). English is mainly used these days for communication, accelerating its presence and becoming international language of information and knowledge- these are acknowledged as tools of economic and political power in this modern age.

It is not surprising that English is more integrating, all over the world, into the education system. This vast spread use of English compels countries to review their policies regarding language in the education system. There are two outstanding phenomena of English language; one where English is taught as foreign or second language and secondly English as medium of instruction. The latter case was more predominant where English had semi-official or official status, in the education system, in colonies where Britain and U.S. ruled. While there is tendency in some countries to revert back to mother tongue in the education system, English as medium of instruction perpetuates due to political and social restructuring after the political independence,. (Evans, 2002; Flowerdew; 1998; Rahman; 1997; Ramanathan, 1999; Tickoo, 1996). Consequently, the role of English language has become very prominent in national education of the countries.

In Pakistan, Education conference was held in 1947, just after independence. It was decided by Government of Pakistan that Urdu will be used, as medium of instructions, in Public schools. It was thought that our children would benefit from Urdu-medium in the education system as they would learn in their mother tongue without the process of translation; the result would be a better understanding of concepts. English language was given official status in the country. It was also decided that all official correspondence would be transferred to Urdu within fifteen years. At the that time English medium schools were funded by Christian missions in urban areas. These schools were very popular among wealthy communities of the country. Subjects at intermediate and Bachelor levels were taught both in Urdu and English languages colleges but for science subjects English-medium was implemented. As a result, many students who came from Urdu- medium background, struggled to cope with instructions in English-medium. Official language of the country was English meant that students who studied in English- medium institutions had better opportunities for employment and better chances for admission to higher education. Therefore English-medium schools became more popular in the country. This inevitably put pressure on the middle class families to send there children to English-medium schools. They had to pay higher fees for this for bright and better future for their children. Nevertheless in 2009 it was announced by Government of Punjab that in all public schools English-medium would be implemented specially for mathematics and science.

“The Government of Pakistan had approved in the curriculum-2006 that mathematics, science and social studies subjects would be taught in English. The School Education Department of Punjab had issued instructions for the implementation of the decision of the federal government, however, the Government of the Punjab was implementing the decision gradually. In the first phase, some primary, middle and high schools have been selected where the above mentioned three subjects would be taught in English. (SED,2013).”

It was recognized that enough preparation was not carried out prior to this decision. According to a research conducted by British Council (2013) revealed that School Teachers were not fully equipped to teach in English-medium.

In order to deliver science skills and knowledge, a language is necessary like any other subject. This study will only concentrate on students' understanding where science is studied in English- medium of instruction. This is essential because language plays very important role in thinking, communication, and also it is a tool for exchanging concepts and ideas between individuals (Aziz, 2003). Nevertheless, recently mathematics and science have been taught in English. This may cause confusion about concepts they study and may retard or slow down their mathematics and science learning. Abrupt change to the existing mathematic and science medium of instruction may produce culture shock and affect their study adversely. In general, students' conceptions of prior knowledge and experience affects students' learning in mathematics and science. Students prior experience and knowledge can be astonishingly resistance to change and tenacious. (Gilbert, 1982). It is therefore vital for this study to explore student's perceptions and viewpoints on learning and teaching mathematics in English language with a view order to collect information and obtain useful results.

Hence to comprehend the present task fully, it is significant to first understand knowledge, the perceptions, readiness and attitudes of these teachers towards adopting English- medium for teaching of science and mathematics. As Pandian (2002) asserts, what teachers know and can do, affect all the core tasks of teaching. Moreover, various studies (Gambrell, 1996; Chakravarthy, 1997; Pandian, 1999) have stressed the roles of teachers influencing the behavior of students.

This study finds out teachers' perception about English Medium Instructions and also investigated whether or not they are competent in teaching science and mathematics in English. Therefore, it provides guidance to the government and other stakeholders on how the teachers view English Medium Instructions. This helps them to improve language skills; this will also investigate whether EMI hinders the learning process due to the concepts of science and mathematics being more difficult to comprehend in the English medium. It will also point out the kind of support required by teachers and students for teaching and learning of science and mathematics in English.

If teachers are not proficient in language then how can we expect them to cope with the double demand of delivering content as well as language so they would face problem covering their subject matter in effective manner. Therefore the teachers may be teaching science and mathematics in a mixture of both Urdu and English. Studies revealed that instructions in first language do not hinder the development of second language (Bacherman, 2007; Tong et al., 2008). On the other hand limited use of mother tongue and consistence reliance on translation affect language development of learners and discourage them from using the second language (Hong, 2008).

Therefore to understand the task at hand, it is vital for us to find out the attitudes, perceptions, and readiness of the teachers towards teaching of science and mathematic in English. As Pandian (2002) states, what teachers can do and know, affect the core tasks of teaching. Moreover, several studies (Gambrell, 1996; Chakravarthy, 1997; Pandian,) have emphasized the influence of the roles of teachers on behavior of students. Therefore the purpose of this study was to investigate the following research questions:

- i. What are the perceptions of teachers regarding English medium instruction at secondary education?
- ii. Do teachers favor English-medium instruction at secondary education?
- iii. According to the perceptions of teachers, does English-medium instruction influence the instructional process at secondary education?
- iv. Does English-medium instruction influence students' learning of the subject matter/content?
- v. Does English-medium instruction influence students' linguistic skills?
- vi. Does English-medium instruction influence teachers' teaching performance?

Methodology

This study sought to obtain completion of teachers teaching mathematics and science in one of the schools of Punjab Pakistan in respect to English as medium of instruction for teaching of science and mathematics.

Instruments: A set of questionnaire were administered to the subjects to determine teachers' English language command as well as problems that they faced using English in the teaching of mathematics and science. The questionnaire also asked selected personal background information of the subjects and statements related to teacher views and teaching practices in regard to teaching mathematics and science in English. The choice of answers was given on a Likert scale ranging from 'always' to 'never'.

Subjects: The data were collected from teachers via self-designed instruments. The instruments consisted of a survey questionnaire and interview protocols. The former contained Likert scales as well as categorical and numeric items, which gave quantifiable data. Besides these, there were open-ended questions in the survey questionnaire, which yielded qualitative data. The latter gave qualitative data via semi-structured questions. The pilot study also comprised qualitative and quantitative procedures that involved validity and reliability check. Interims of data analysis, descriptive and correlational statistics were used in connection with the scales, all of which are quantitative procedures. For the analysis of interviews and open-ended questions, a qualitative procedure, content analysis.

A total of 17 schools were contacted in 4 district out of 38 districts of Punjab, these schools were using EMI in teaching of Mathematics and Science. The data source for the survey were teachers. The teachers in the selected in the secondary schools were all content area teachers who were teaching or have taught Mathematics and Science subjects in medium of English or partially in English. Therefore the total population in the selected schools has been reflected in the sample. Out of those schools 85 teachers 5 from each were selected and the majority of the teachers had at least five years teaching experience.

Data analysis: Both qualitative and quantitative data analyses were used in the study. The subjects' responses were analyzed using descriptive statistics. Percentages and frequencies of their responses to the items related to their reaction to the medium of instruction, the problems encountered in terms of the use of English in the classroom, their awareness of scientific and mathematical discourse and the support available to them were calculated. Interview data were qualitatively analyzed with initial descriptive codes being assigned to teachers' responses. Related codes were then grouped according to categories and common themes (Bogdan and Biklen, 2003). Illustrative quotations representing each theme are used to support findings of the survey.

The data analysis showed that teachers think that there are benefits of EMI.

Table 1
Benefits for EMI

Statements	Math (n=42)	Science (n=43)	Male (n=40)	Female (n=45)	Total (n=85)
	M(SD) (%)	M (SD) (%)	M(SD) (%)	M (SD) (%)	M(SD) (%)
7 Attending a EMI institution, improves individual social prestige	68(23)	74(22)	75(21)	68(23)	71(22)
13 EMI contributes to students' cognitive development.	78(20)	77(22)	81(19)	75(22)	78(21)
16 I find English-medium instruction (EMI) useful.	75(18)	68 (23)	77(27)*	67(23)	72(21)
34 EMI increase the employability chances of students.	74(23)	73 (24)	78(23)	69(23)	74(23)

Mostly teachers 76 % considered that there are benefits of EMI, therefore they had the reasons to favor the EMI instructions. Both groups' male and female teachers appreciate the benefits of EMI. While male found EMI more useful than female. More males 77% are found English medium instruction useful than female 67%. Teachers have reasons to support EMI in Mathematics and Science subjects (Table 1)

Table 2
Teacher's Competency in EMI

Statements	Math	Science	Male	Female	Total
	(n=42)	(n=43)	(n=40)	(n=45)	(n=85)
	M(SD)	M (SD)	M(SD)	M (SD)	M(SD)
	(%)	(%)	(%)	(%)	(%)
31 Teachers have appropriate skills of English to Teach in EMI.	70(23)	70 (25)	73(22)	68(25)	70(24)
32 Teachers have problems teaching in EMI.*	71(19)	76 (21)	73(19)	74(22)	74(20)
35 I explain in Urdu when I have problem explaining concepts in English.	72(20)	77(20)	72 (19)	75(21)	75(20)
36 My Students do not understand when I explain in English.	73(20)	76(19)	71(22)	68(20)	76(20)

Mostly teachers (70%) felt that teachers do not have appropriate skills to teach Mathematics and Science subjects in EMI. Most of them (74%) thought that teachers had problem teaching Mathematics and Science subjects in EMI. 75% teachers use Urdu to explain the content. 76% think that students don't understand in English.

Table 3*Students' competency in Learning Mathematics and Science in EMI*

Statements	Math	Science	Male	Female	Total
	(n=42)	(n=43)	(n=40)	(n=45)	(n=85)
	M(SD)	M (SD)	M(SD)	M (SD)	M(SD)
	(%)	(%)	(%)	(%)	(%)
23 To study science and math subjects in English does not negatively affect students' success in the university entrance exam.	65(21)	71 (25)	74(22)*	62(23)	68(23)
27 Students have problem understanding concepts of mathematics in EMI.	64(20)	70 (26)	68(23)	66(23)	67(23)
28 Students have problem understanding concepts of Science in EMI.*	64(20)*	73 (20)	69(21)	68(20)	69(20)
29 Students will have better understanding of mathematics in Urdu.*	69(23)	68 (23)	66(25)	70(20)	69(23)
30 Students will have better understanding of Science in Urdu.*	67(24)	70 (25)	66(28)	70(21)	68(24)

Mostly teachers (67% and 69%) felt that students have difficulty in understanding Mathematics and Science instructions English. While (69%) viewed Urdu medium instruction can help students to understand Mathematics better; while 68% considered that teaching Science in Urdu will provide better understanding of concepts. On the other hand 68% feel that EMI will not affect University entrance examination.

Table 4
EMI Effect on Students

Statements	Math	Science	Male	Female	Total
	(n=42)	(n=43)	(n=40)	(n=45)	(n=85)
	M(SD)	M (SD)	M(SD)	M (SD)	M(SD)
	(%)	(%)	(%)	(%)	(%)
4 If science and Math subjects are studied in English, the students can learn the language of science and technology.	78(20)	73(20)	77(22)	74(19)	76(20)
22 EMI has a negative effect on the efficiency of science and math instruction.*	62(23)	71 (22)	65(26)	69(22)	67(23)
24 EMI will have an adverse effect on student achievement in science and math subjects.*	66(20)	74 (19)	67(22)	73(18)	70(20)

Many teachers 76% felt that EMI facilitate to learn the language of science and technology. 67% thought that EMI affect negatively the instruction of teachers. While 70% viewed that EMI have adverse effect on students' achievements.

Results and Discussion

The purpose of the study was to determine and describe the perceptions of teachers regarding English-medium (EMI) at secondary education in Punjab Pakistan and to find out whether instructional process was influenced by EMI from the viewpoint of teachers.

Benefits for EMI: The results provided a clear answer to the position of teachers about English-medium instruction (EMI). The data obtained from the EMI scale indicated that *teachers did not favor English as a medium of instruction* at secondary education. But they appreciate that there are certain benefits of English medium instructions. Both Science and Mathematics teachers understand the benefits of EMI.

Mostly teachers 76 % considered that there are benefits of EMI, therefore they had the reasons to favor the EMI instructions. Both groups' male and female teachers appreciate the benefits of EMI. While male found EMI more useful than female. More males 77% are found English medium instruction useful than female 67%. Teachers have reasons to support EMI in Mathematics and Science subjects (Table 1). Although, teachers considered the EMI are useful to compete in the world but there are issues in English Medium Instructions

Teacher's Competency in EMI: The results revealed that mostly teachers (70%) felt that teachers do not have appropriate skills to teach Mathematics and Science subjects in EMI. Most of them (74%) thought that teachers had problem teaching Mathematics and Science subjects in EMI. 75% teachers use Urdu to explain the content (Table2). 75% teachers use Urdu to explain the content. 76% think that students do not understand in English.

It was found that the main problem encountered by teachers was in explaining concepts in English. Students also have problems understanding concepts of mathematics and Science in English. Teachers responded that students cannot understand when EMI are used to explain the concepts. Then teachers have to use Urdu for instructions for explaining the contents.

The main purpose of introducing Medium of instruction English in the learning and teaching of science and mathematics is mainly to support students to learn the language and developments in science and technology. It is possible for students to access the information which is normally available in English language. Teachers generally understand this requirement and therefore are trying to assist this move. Moreover, some of the teachers feel that they lack the required language skills to teach these subjects in English. However, there is certainly a need for these teachers to develop their language skills. It then becomes critical for them to gain mastery of the language of the content of the subject in English. Although Government of Punjab is providing professional development courses/ workshops for these teachers, but these are not enough to address the issue and providing the capacity to teachers to feel confident in teaching English medium.

Students' competency in Learning Mathematics and Science in EMI: The results indicated that the percentages of teachers who do not support EMI range Mostly teachers (67% and 69%) felt that students have difficulty in understanding Mathematics and Science instructions English. While (69%) viewed Urdu medium instruction can help students to understand Mathematics better; while 68% considered that teaching Science in Urdu will provide better understanding of concepts (Table 3). Therefore, teachers felt that English Medium Instructions have negative effect upon students. Teachers perceived that in Urdu Medium of Instructions students can understand the concepts of science and Mathematics better. It is easier for students to learn the concepts in their first language as they do not have to go through the laborious process of translation.

EMI Effect on Students

Many teachers 76% felt that EMI facilitate to learn the language of science and technology. 67% thought that EMI affect negatively the instruction of teachers. While 70% viewed that EMI have adverse effect on students' achievements (Table 4). Hence teachers understand the importance of EMI, but they lack the competency teaching in English.

Conclusion and Recommendation

The findings suggest that teachers of science and mathematics recognize that there is need for change in medium of instruction. They are appreciating it and reacting to this change positively. Though, teachers are experiencing problems in EMI not only in their own language insufficiencies, but also their students lacking the required language skills to comprehend their subject contents. The predominant language support mechanisms provided by the Government do not meet their needs. Thus, it is necessary that measures should be taken to support the teachers in the teaching of mathematics and science in English. Language inadequacies of teachers and students should not affect the teachers' ability to deliver the content and students skills to understand the subject matter.

For successful teaching of mathematics and science in EMI, teacher educators and policy makers must make deliberate efforts to meet the needs of the students and teachers concerned. Failing that, the Government has to look into the possibility of returning back the teaching of science and mathematics in the Urdu.

However, to generalize findings in the entire country the sample size was too small. Diverse geographical location and bigger sample size possibly will provide different results. A further study can be conducted with bigger sample size is recommended. Moreover, in this study only teachers' views were sought, while students and parents perceptions can also be sought.

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