

## THE EFFECT OF BILINGUAL METHOD OF INSTRUCTION ON COGNITIVE SKILLS OF HIGHER SECONDARY SCHOOL STUDENTS

AQEELA RASHID<sup>1</sup> & MUHAMMAD IQBAL<sup>2</sup>

<sup>1</sup>Assistant Professor, Education Department, Forman Christian College (A Chartered University), Lahore, Pakistan

<sup>2</sup>Assistant Professor, Division of Education, University of Education, Lahore, Pakistan

### ABSTRACT

Research on bilingual education has demonstrated that language of instruction has an important impact on cognitive skills of students. This article reports on the findings from a study that investigated the effect of bilingual instruction on students' knowledge, comprehension, and application skills in the subject of Education from a data source of achievement test. Sixty higher secondary school students (1st year college) from Humanities group of one college of Lahore were randomly selected and randomly divided into experimental and control groups with thirty in each group. Convenient sampling technique was used for the selection of the college. Firstly, pre-test was administered to both groups. The experimental group was taught by Bilingual Method of Instruction (BMI) using English and Urdu languages, whereas the control group was taught by Monolingual Method of Instruction (MMI) using English language only. After six weeks, post test was administered. 't' test was applied to compare the results of both groups on achievement test. The study found that those who were taught by Bilingual Method of Instruction (BMI) demonstrated better knowledge, comprehension, and application skills as compared to the students taught by Monolingual Method of Instruction (MMI).

**KEYWORDS:** Bilingual Method of Instruction, Monolingual Method of Instruction, Cognitive Skills

### INTRODUCTION

A close observation of role of language in the classroom towards students' learning shows that selection of language as a medium of instruction is vital and meaningful area of an education system. Over the last few decades, researchers and teachers have studied the use of language in classroom ever more closely. This may be due to the fact that on one hand, many educators and policy makers feel that the language of instruction should be English only, because English skills are essential to achievement in every academic subject and to educational and economic opportunities. On the other hand parents and some community groups feel strongly about the need to instruct children in their home language as a way to enhance their learning as well as maintain their cultural identity (Moreno,2010). As a result, the question whether English language or mother tongue or combination of both should be adopted as medium of instruction for English as a second language students has become debatable. Due to the controversial nature of this academic issue, it is difficult to come up with an unequivocal answer.

Historically, the most common method used to help students whose primary language is other than English, is bilingual instruction. Bilingual instruction is a method in which students are provided instruction in two languages to master the knowledge necessary to communicate in two cultures. A recent review of studies conducted in this area makes clear that despite all the research available there are still no clear answers to many practical questions arising from use of two languages for English as a second language learners, for example at what age and in what manner is it to introduce a second language, are purely academic (Romaine, 1999).

Unfortunately, the education profession has spread a number of myths about students' learning who are taught in

two languages. Indeed the very term bilingual is often used as a euphemism for disadvantaged. It may be noted that no universally acceptable definition of bilingualism has thus far been given.

Current literature reveals that though the term “bilingualism” seems plain and definite, it carries a variety of meaning and interpretations. Ever since the publication of Peal & Lambert’s (1962) classic work, there has been a tendency to define bilingualism in terms of linguistic proficiency. The term “bilingualism” is compounded from the prefix ‘bi’ meaning ‘two’ and a stem derived from the Latin ‘Lingua’ meaning ‘a tongue’. According to Weinreich (1953), bilingualism is the use of two languages alternately by the same person. Leopold (1949), is of the view that bilingualism is the ability to speak two languages which are spoken equally well for all the purposes of life. According to Woolfolk (2004) two terms associated with bilingualism are English as a second language (ESL), describing classes for students whose primary language is not English, and Limited English Proficiency (LEP), referring to students whose English skills are limited. There are disagreements about the meaning of bilingualism. This may be one of the reasons why the mass of research on bilingualism has led to a mass of contradictory conclusions.

Most of the research on children’s language acquisition has been concerned with monolinguals rather than bilinguals, despite the predominance of bilingualism in the world’s population. Moreover, most of it deals with the acquisition of English. Romaine (1999) argued that the available literature on children’s bilingualism is also fraught with methodological problems and does not yet provide a solid basis for answering decisively many of the important questions one would like most to have answers to, e.g. is there a cognitive advantage to bilingualism?, is it the case that a feature or category acquired from one language acts as a booster to its acquisition in the other, to what extent are the bilingual’s two languages differentiate both at the conceptual and linguistic levels, and to what extent does bilingual acquisition parallel monolingual acquisition.

Cognitive development, when broadly construed to mean the development of all forms of mental representation including development of different cognitive skills. The term refers to the ability to go beyond the communicative use, to which language is put. Much of the current work in bilingualism and cognitive development refers to the linguistic domain, generally referred to as metalinguistic awareness whereas the cognitive domain is neglected.

Bilingualism is envied and admired as well as feared. Early theorist and researchers proposed that bilingualism produces cognitive deficits. For example, according to Jespersen (1992), the brain effort required to master the two languages instead of one certainly diminishes the child’s power of learning other things which might and ought to be learnt. According to that view, an individual’s cognitive capacity is limited; bilinguals think less efficiently because their brain stores two different linguistic systems (Lambert, 1990). The early research on bilingualism seemed to support that conclusion. However, this research was seriously flawed.

According to Fromkin, Rodman, & Hyams, (2003) many early studies (before the 1960s) showed that bilingual children did worse than monolingual children on IQ and other cognitive and educational tests. Bilingual education has not greatly improved students’ scores in English or mathematics (Heubert, 1988). In one study, three groups of high school students—German or Swedish monolinguals, German—Swedish bilinguals, and tri-linguals (German—Swedish plus any L3)—were compared in their speeds in naming objects and numbers, reading aloud words, and decoding. On all tasks, bilinguals were slower than monolinguals and tri-linguals were still slower than bilinguals. Reasons can be bilingual uses each language less frequently than a monolingual uses one language, two languages interfere with each other, a bilingual has the extracognitive tasks of determining which or two alternative linguistic systems he needs

to use and of choosing one of the two and a bilingual's vocabulary is large, as it includes words from two languages. Each one of these four conditions will become worse as the number of languages increases (Magiste 1979).

In another study English speakers who speak a variety of L2 (Spanish, German, French, Italian, Persian, and Greek) were compared to English monolinguals on four verbal tasks: list recognition, lexical decision, object naming, and free recall. Only English words were used in the session. In twenty comparisons, bilinguals were slower than monolinguals in recognizing abstract words and in lexical decisions on abstract, concrete, and non-words; there were no differences between the two groups on other tasks (Taylor and Taylor, 1990). The doubts frequently raised in connection with bilingual instruction are whether it overburdens the mind, creates unhappiness and confusion, leads to inefficiency in both languages, or adversely affects the mental development of the child. In conclusion, bilinguals may experience a slight disadvantage in cognitive processing over monolinguals, but this disadvantage is far outweighed by the advantages of being able to function in two languages.

Related literature also shows that it has positive effects on students' cognitive development. Ryburn (1957) articulates that the teaching of English side by side with the mother tongue does not create any hindrance in the process of learning. He goes on to say that there is sometimes a false antithesis set up between English and the mother tongue. It is wrongly supposed that if the latter is emphasized, the former suffers. Research shows that the students who are more proficient in their first language can easily learn a second language (Bozzone, 1995). Use of second language along with first can enhance their thinking skills, metalinguistic skills and the ability to think about language itself (Bialystok, 2001; Bowey, 1986; Diaz & Klinger, 1991). Baker (1998) emphasizes that use of English with first language supports children having temporary difficulties following a lesson in English. It is the only mechanism through which they make sense of their own world experiences (Macedo, 1991). Moreover, not providing ESL learners with a voice in the classroom can hinder their need to feel accepted, which further leads to a condition of demotivation to learn (Ryan & Deci, 2000).

In one of the studies lower-class French-Canadian bilingual were compared with middle-class English-Canadian monolinguals. All the achievement and IQ testing was conducting in English, which was the monolingual children's native language. Bilinguals were found to be more advanced in school, they scored better on tests of first-language skills, and they showed greater mental flexibility (Garcia, Jimenez, & Pearson, 1998). Some researchers of this area have observed some other favorable effects of bilingual schooling in some localities involving other pairs of languages: Israel (Ben-Zeev 1977), United States (e.g., Duncan & De Avila 1979; Tobias, 1994), and Canada (Genesee, 1987; Genesee, Holobow, Lambert, & Chartrand, 1989). Related researches have shown that multiple language skills do not confuse the mind. Quite the contrary: when well-developed, they seem to provide cognitive advantages, although such effects are complex and difficult to measure (Hakuta, 1984; 1986; Hakuta & Susan, 1985).

Although, much attention has been paid to the phenomena of bilingual instruction in recent years, however, despite a profusion of studies in this area understanding of the nature and effects of bilingual method of instruction on students' cognitive skills is still crude and leads to conflicting conclusions. The majority of studies describe above point to the contributing effect of bilingual education on linguistic proficiency of learners, there is scarcity of such research on the development of cognitive skills like knowledge, comprehension and application among students in subjects other than English as a result of bilingual method of instruction. Thus, the present research focuses on the impact of bilingual method of instruction on the development of cognitive skills i. e. knowledge, comprehension and application of students in subject of Education at college level.

## OBJECTIVES OF THE STUDY

- To investigate whether the cognitive skills of 11th graders develop equally by Bilingual Method of Instruction or by Monolingual Method of Instruction.
- To determine the effects of Bilingual Method of Instruction on knowledge of students.
- To examine the change in comprehension level as a result of Bilingual Method of Instruction.
- To investigate the effects of Bilingual Method of Instruction on application skill of students in comparison with Monolingual Method of Instruction.

## HYPOTHESES OF THE STUDY

The null hypotheses of the study that correspond to the objectives of the study were as follows:

**Ho1:** There is no difference in the academic achievement of groups on cognitive skills taught by Bilingual Method of Instruction and Monolingual Method of Instruction.

**Ho2:** There is no difference in knowledge between the groups taught by Bilingual Method of Instruction and Monolingual Method of Instruction.

**Ho3:** There is no difference in comprehension between the groups taught by Bilingual Method of Instruction and Monolingual Method of Instruction.

**Ho4:** There is no difference in application between the groups taught by Bilingual Method of Instruction and Monolingual Method of Instruction.

## RESEARCH METHOD

### Participants

The subjects selected for this study were eleventh grade (College 1st year) humanities students from one private college located in Lahore city. As per requirement of the nature of study students should be selected from the institute where English language was the medium of instruction. The participating college was selected by convenient sampling as it was the best possible option researcher had. Out of one hundred and twenty students of humanities group studying Education as a subject, sixty were randomly selected and randomly assigned to experimental and control groups.

### Design

Pretest-posttest control group design was employed in the study. Rationale for employing this design was the recommendation of Franekel and Wallen (2006) in the cases where we want to check that both groups are equivalent before treatment. Because if the results of pretest show that groups are not equivalent, than the researcher should seek to make them so before administering the treatment.

### Instrument for Data Collection

An achievement test was developed by the researcher to use as a pre-test and a post-test to collect data. The test was developed to assess three cognitive skills i.e. knowledge, comprehension and application. The purpose of development of achievement test was to find out the effect of bilingual instruction on the development of cognitive skills of the students in the subject area of Education. As no achievement test covering the topics for higher secondary level students was available, so it was developed by the researcher herself. The achievement test was developed from the syllabus of

Education given by Board of Intermediate and Secondary Education (BISE) Lahore. The test was an objective type test consisted of 40 items in total, 15 multiple choice questions (MCQs) to measure knowledge, 15 fill-in-the blanks items to measure comprehension and 10 items of column matching to measure the application ability of the students.

As there was no criteria available to decide the proportion of items measuring knowledge, comprehension and application components of achievement, researcher worked for the required proportion of emphasis for various levels of cognitive domain by classifying the objectives of teaching Education subject in terms of the taxonomy of cognitive domain. So the proportion of items included in the test was based on the relative proportion of emphasis laid in the objectives introduced by BISE for the subject of Education. The duration of this test was forty five minutes. The achievement test was validated by experienced teachers of relevant subject of Education.

### Procedure

Sixty male students of eleventh grade with an average age of 17 years were randomly selected and randomly assigned to either the bilingual method of instruction treatment group or the monolingual method of instruction control group with 30 students in each group. The random assignment helped ensure the equivalence of groups and control for extraneous variables that may have confounded the results. The independent variable in this study was the instructional method and the dependent variables were the subjects' knowledge, comprehension, and application skills.

A pre-test was administered to both experimental and control groups to collect data. After conducting the pretest, experimental group was taught by Bilingual Method of Instruction (BMI) using English and Urdu languages, while the control group was taught by Monolingual Method of Instruction (MMI) using English language only. Text material of "Foundations of Education" was selected from the syllabus to teach. The reason for the selection of this particular content was the learning objectives to teach this content mentioned in BISE syllabus of Education which were development of knowledge, comprehension and application skills. Both groups were taught by the researcher. Treatment was given for six weeks. After six weeks, post-test was administered to both experimental and control groups. Post-test was exactly the same in content as pre-test was. The only difference was change in sequence and order of the items.

### Findings

Once the scores on post- test had been obtained, data was analyzed with the help of SPSS and T-Test was applied to compare the results of both groups. The stated hypotheses were then tested using different statistical techniques and the findings were as follows.

**Table 1: Summarizes the Analysis of Overall Achievement Scores of Experimental and Control Groups**

Group	N	Mean	Std. Deviation	Mean Difference	T	Sig. (2-Tailed)
Experimental	30	24.43	5.42	4.43	3.36	0.00
Control	30	20.00	4.83			

Summary of the results of independent sample t-test presents in the above table reveals that the mean achievement scores of the experimental and the control group students are significantly different. On comparing mean scores of experimental and control groups on Post-test, it is observed that the mean score of experimental group on post-test is 24.43 greater than the post test score of control group i. e 20. So the first null hypothesis Ho1, stating no difference between the overall academic achievement of experimental and control group students' is rejected. Rejection of null hypothesis leads to the conclusion that the students of experimental group who were taught through Bilingual Method of Instruction (BMI) performed better than those who were taught through Monolingual Method of Instruction (MMI).

### Achievement on Knowledge Component

**Table 2: Summarizes the Analysis of Scores on Knowledge Component of Post-Achievement Scores of Experimental and Control Groups**

Group	N	Mean	Std. Deviation	Mean Difference	T	Sig. (2-Tailed)
Experimental	30	10.40	2.11	1.47	2.61	0.01
Control	30	8.93	2.23			

It is evident from the above table that the mean scores of two randomly selected groups on knowledge component of achievement test is different at 0.05 level of significance. Hence the null hypothesis, Ho2, stating that there is no difference in knowledge between the groups taught by Bilingual Method of Instruction and Monolingual Method of Instruction was rejected. It means that the students of experimental group who received Bilingual Method of Instruction (BMI) performed better on knowledge component of achievement test than those who were taught through Monolingual Method of Instruction (MMI).

### Achievement on Comprehension Component

**Table 3: Summarizes the Analysis of Scores on Comprehension Component of Post-Achievement Scores of Experimental and Control Groups**

Group	N	Mean	Std. Deviation	Mean Difference	T	Sig. (2-Tailed)
Experimental	30	8.73	2.63	2.00	2.96	0.01
Control	30	6.73	2.50			

Summary of the independent sample t-test in the above table shows that the mean scores of the experimental and the control group students on comprehension component of achievement test reveals that mean scores of both the groups are significantly different at 0.05 level of significance. Hence the null hypothesis, Ho3, stating that there is no difference in comprehension between the groups taught by Bilingual Method of Instruction and Monolingual Method of Instruction was rejected. Rejection of null hypothesis leads to the conclusion that the students of experimental group who received Bilingual Method of Instruction (BMI) performed better on comprehension component of achievement test than those who were taught through Monolingual Method of Instruction (MMI).

### Achievement on Application Component

Table 4 summarizes the results of independent sample t-test employed to find out the significant difference between mean scores of the experimental and the control groups on application component of achievement test.

**Table 4: Summarizes the Analysis of Scores on Application Component of Post-Achievement Scores of Experimental and Control Groups**

Group	N	Mean	Std. Deviation	Mean Difference	T	Sig. (2-Tailed)
Experimental	30	5.40	2.55	1.27	2.03	0.051
Control	30	4.13	2.10			

Summary of the results of independent sample t-test presented in the table above reveals that mean achievement scores of two randomly selected groups are significantly different beyond 0.05. Hence the null hypothesis, Ho4, stating that there is no difference in application between the groups taught by Bilingual Method of Instruction and Monolingual Method of Instruction was rejected. Hence it is concluded that Bilingual Method of Instruction (BMI) has more positive effects on application component of students' learning than the Monolingual Method of Instruction (MMI).

## Implications

The results of the present study lead to the conclusion that Bilingual Method of Instruction (BMI) is more effective as compared to Monolingual Method of Instruction (MMI) for English as second language students to enhance their knowledge, comprehension, and application skills at higher secondary level. Thus, if language appears to influence students' cognitive development, identifying the most appropriate method of instruction in English as second language (ESL) context that contribute to the development of cognitive skills deserve consideration. This, in turn, necessitates developing bilingual programs and preparation programs for ESL teachers focusing on skills associated with BMI to help their students in developing their cognitive skills. These programs should be specifically targeted at less experienced teachers teaching in ESL settings. It is also recommended that different bilingual approaches of teaching be part of every teacher's professional development, given the fact that some of the problems that arise in students' learning are rooted in the language used by teachers in classroom.

English is highly desirable, indispensable language of the present time. The trend of English medium schools is growing rapidly in Pakistan. Punjab Provincial Government has converted all Urdu medium schools into English medium schools in Punjab. Expansion in education especially change of medium of instruction warrant the utilization of Bilingual method of Instruction (BMI). Language is a tool used by the teachers to get student's attention, to present information, to emphasize particular points, to provoke discussion, to praise, to push for better answers and to explain. To promote learning activities teachers should incorporate the students' first language into teaching.

## DISCUSSIONS

The present study sought to investigate the impact of Bilingual Method of Instruction on college students' knowledge, comprehension, and application skills. Results indicate that students taught the subject of Education by Bilingual Method of Instruction (BMI) outperformed the students who were taught by Monolingual Method of Instruction (MMI) on the achievement test. The results of present study are in consonance with the results of many other studies demonstrating effectiveness of bilingual education. Berk (2006), Ricciardelli (1992) and Bialystok (2001) found that higher degrees of bilingualism are correlated with increased cognitive abilities in such areas of concept formation, creativity, and cognitive flexibility. Students improve in the subjects they were taught in their native language, in their mastering of English (Woolfolk, 2004). Fromkin, Rodman, & Hyams, (2003) declare that bilingual children outperform monolinguals in certain kinds of problem solving. According to Matlin (2005), bilinguals show superior performance on measures of ability to follow instructions, creativity, concept formation, and problem solving.

## Suggestions for Further Research

- This study explored the impact of BMI on students' knowledge, comprehension, and application skills using an achievement test. In subsequent studies, researchers could check the impact of BMI on synthesis, valuation, and analysis skills.
- In the current study, participants were male students only at higher secondary school level. The research could be carried out with female students.
- This study was conducted only in a college; further research is needed particularly in public schools where English only has been declared the medium of instruction.

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