



Mother Tongue as Medium of Instruction for Effective Communication and Science Learning at Elementary Level

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Abstract: *In most of the developed countries, science is being taught in the native language. However, the situation is not the same in other countries. This quasi-experimental study was designed to find the effect of communication using native language on student's learning of science subject at the elementary level. The sample of the study consisted of 50 Pushto speaking female students of Swabi KPK, Pakistan. The results of the study indicated that in the post-test, scores of the experimental and control groups were significantly different. The study concluded that in fostering student's science learning, teaching science through mother tongue is found effective at the elementary level as it enables students to communicate with teachers and other fellow students and enables them to discuss ideas, experiences, and problems faced during the learning process. It is suggested that this investigation should be repeated in other districts where pupils do not perform well in other science subjects.*

Key Words: Application, Comprehension, Knowledge, The medium of instruction.

Introduction

The debate of medium of instruction always remained a point of serious discussion for curriculum developers and implementors. It is believed that to get success in education, there is a need to promote mother language as success in education is associated with language (Patrick, 2013; Patrick, et al. 2014). In this subcontinent, the English language was introduced in the 17th century; after 1857, English became the official language in the subcontinent. English is an important subject at the primary and secondary level in Pakistan. Efforts are being made to use English in daily communication with students in school. The use of native languages such as Urdu & Punjabi, Saraiki can impact the learning of the English language. A majority (91.62%) of people of Pakistan speak their mother tongue at their home but do not use the same languages in education institutions.

The mother tongue is a language that every person speaks in his/her home. It is transferred from his/her parents (Yadav 2014). A mother tongue is a language the child can speak fluently before going to school. It may or may not be the language spoken by both parents, but it is one in which the child can operate confidently in all domains relevant to the child's life. In this sense, the bilingual child has two mother tongues (Dyken, 1990 p.40, cited in Akinnaso, 1993 p. 27, cited by Bloch, 2002).

It is the language, first learned by a child either is spoken by a mother or father side. In Pakistan and many Asian countries, women adopt the lifestyle and language of their spouse, and therefore their children learn the tongue of the father, in some double language situation when both mother and father have distinct communication backgrounds, and they can communicate in a third language with their kids. In Pakistani urban areas, this situation is very common, where both mother and father speak Urdu or English with their children while they are from Punjabi and Pashto background. Thus, the situation

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also becomes complex to know the mother tongue of a child. The problem is possible to resolve by clarifying the notion of mother tongue as the home language only ([Akhtar and Shahzad, 2017](#)).

Learning in their mother tongue is very easy for children, whereas learning in a foreign language takes more time thus reducing time for their play and other activities, it eventually demolishes the personality of the children naturally ([Sathiaseelan, 2013](#)). therefore, researchers ([Hassanzadeh et al. 2011](#); Butzkamm, 2003 and Mackenzie & Walker as cited by [Khan, 2014](#)) have emphasized that instruction must be given to the students in their mother tongue because mother tongue can be eliminated from the classroom, but it cannot be eliminated from their minds. Mother's tongue is very helpful in the learning and understanding of a second language as it provides guidance and help. Therefore, training in their mother tongue is required and very essential because children imagine and fantasize in their mother tongue and it is the primary tool and requirement of people's traditions and schooling ([Sathiaseelan, 2013](#)).

For the development of every country, science education must be given preference due to scientific knowledge; many developed countries are capable of being economically stable (Kola, 2013). Therefore, science teaching must be joyful and interesting as children are naturally very curious to know about the things around them ([Greenspan, 2016](#)). Language plays a vital role in science learning, as it is a subject of practical nature. Science teaching requires experimentation, but a language is required for effective teaching and learning, either it is written in textbooks or used orally during a teaching in class ([Oyoo, 2015](#)). In practical work, the use of language is very important; teachers explain the science processes and students need to ask questions. Teachers use language for communication or explanation of science concepts; they use language which could either be the learner's mother tongue or the everyday language the learner use for communication ([Khurrana, and Sharma, 2017](#)).

Science learning demands student's considerable attitude towards science. These attitudes towards science help for inducing scientific attitude among students, and it can only be possible when students have a clear understanding of scientific concepts ([Choudhary, 2016](#)). According to many researchers, the mother tongue has a great effect on science learning ([Oyoo, 2015](#)). Science is thought to be a tough school subject because science words are difficult or sometimes pupils are unfamiliar with science words; the students become confused when in everyday language the word is one meaning while different in science. [Khurrana and Sharma \(2017\)](#) stated that science teaching in everyday language is very helpful in learning. [Oyoo \(2015\)](#) also suggested that "students learning in their mother tongue are good learners as compares to those who are learning in a language to which they are not familiar with or foreign language". According to ([Khan, 2014](#)) those countries that have produced great scientists have one thing in similarity; they taught basic sciences (high school and college at least) are in their mother language, For instance, Japan, Germany, China, USA, and France.

[Bhurgri \(2002\)](#) explained that Punjabi, Saraiki, Sindhi, Pashto, Urdu, Balochi, Hindko and Brahui are majorly spoken languages in Pakistan, and in these languages, just Urdu, Sindhi, and Pushto are standardized, in Sindh medium of education, and the main language was Sindhi while in other three provinces Urdu is used as the medium of education although the people of these provinces spoken native language or their mother, not Urdu.

Pashto is mainly spoken by the Pashtun people in Pakistan (Khyber Pakhtunkhwa and Balochistan regions), and Afghanistan (east, south, and Southwest of the country), and Pushto is an Indo-Iranian language. According to [Mostefa, et al. \(2012\)](#) Pushto is also spoken by Pakhtoon refugees around the world with a large number of inhabitants in the United Arab Emirates, Iran, United Kingdom, Canada, India, United States, Malaysia, and Singapore. This is also investigated by ([Mostefa, et al. 2012](#)) that in Pushto two different systems existed for Pashto writing, the first one which is used in the Pakistani region is called Yousafzai and is affected by Urdu and English, the other one mostly is spoken in Afghanistan, it is affected by Dari language and called Afghani Pushto.

According to [LAD \(1990\)](#), several language activists try to make the mother tongue the language of schooling and teaching in KPK and Baluchistan institutes for this purpose they passed a bill from the Baluchistan Legislative Assembly to imposed the Baluch, Brahvi, and Pushto as a medium of instruction in rural schools. According to the [report, \(1991\)](#), the researchers visited six government school of swat

and presented a report in 1991 in which all teachers were using Pushto as an instructional language, and approximately 80% of the learners were capable of reading Pushto textbook fluently, even they can also solve mathematics in Pushto language, in Kalam valley where the Kohistani is local language of the entire population but still, they use Pashto as a medium of instruction in institutes. According to [Benson \(2005\)](#), girls stay longer in those classes where they are experiencing bilingual, home school changes are very easy in those schools where the mother tongue is used as an instructional language, mostly female students are less confident in a foreign language or second language and they are only comfortable when they make conversation and learn in their familiar language, girls speaking and learning in mother tongue enjoy school and think that the schooling is appropriate when they get success, this promotes their achievements and produce confidence in them to continue their school careers. In known language girls learn greatly and can represent smoothly what they learn, girls in familiar language become able to talk to their teacher and other pupils and easily express their experience and imaginations and can practically represent whatever they learn, by the help of mother tongue the instructor can make a sense able and practical evaluation of their abilities, and teach what they know instead of stuffing their heads with pointless memorized facts in the second language.

As compared to men, women try to start a conversation but don't try to make the conversation succeed, which affects women's rate of learning and developing a language. Further explained by [Benson \(2005\)](#) that girls enrol in large number in schools when they learn in their native language, female students and their parents may be less worried about attending the schools that use their native languages, a well-known tradition and set of principles, the parents access to get information about enrollment and schooling process become increase if the instructors talk to students and their parents in their native language, families participation increase if the institution uses the mother tongue, better conversation help parents to take part in activities of schools and make decisions, those institutes respond better to community requirements and values, and the curriculum full fill the community requirements so that institutions become more appropriate for female students.

Statement of the Problem

The significant role of a teacher's communication and medium of instruction in the classroom cannot be avoided undoubtedly as it plays a great role in learning. Most of the students are not comfortable with the communication language of teachers. That is why the students cannot communicate effectively with teachers and can face great difficulty in comprehending science subjects. Science learning is essential for students at the elementary level. One thing which is very important and has a great effect on the learning of students is the medium of instruction and the teacher's communication language. This study aimed to find the effect of the native tongue (Pushto) on students learning and to explore how can language background affect the learner's performance in science learning?

Objectives of the Study

1. To compare the impact of teaching by Mother tongue and Urdu on the learning of science students.

Research Hypothesis

Ho: There are no significant differences in the science knowledge acquisition of students who were learning in the instruction of their native language (Pushto) and those who were exposed to the national language (Urdu).

Literature Review

There is a great significance of mother tongue for early education; it is due to mother tongue only that children can be able to communicate and participate in skills of the social work ([Patrick, et al. 2013](#)). However, the mother tongue is very confined and finite and does not have many words to express feelings and thoughts; that's why many people want to talk and communicate in their second language.

Mother tongue is the personal cultural and social identity of an individual. By speaking the mother tongue, people attain successful social standards and speaking skills. Different social backgrounds of people make them different and distinct from others. The native language shapes the conduct, manners, qualities, morality, tradition, and opinions of individuals [Yadav \(2014\)](#).

[Piper et al. \(2018\)](#) argued that in sub-Saharan Africa, there are fewer shreds of evidence that the children who learn and read in their native language have greater learning result in other subjects. In an unsystematic controlled trial of native language learning instruction, in Kenya from 2013 to 2014, the Reading and Primary Math (PRIMR) was started. Outcomes indicated that exercise to the native language had no extra advantage for English or Kiswahili studying results over those groups which were not a speaker of native language, while the speaker of native language group showed the poor development in mathematics subject. The assignments, classroom observation, and examination showed that usage of mother tongue had only less effective in other subjects. The study recommended considering such results in native language programs besides the local usage hindrance in program design.

Communication mode can hinder student's learning when they are not habitual with the instructional language of the school and affects negatively on their development. The mother tongue is a link with language to assist the abilities of learning. UNESCO and other international organizations have usually support native language education which is a strong method to encounter bigotry.

[Khan. \(2014\)](#) stated that human abilities fully strengthen by education, for example, cognitive power and cognitive skill in any program. A language is an important tool of thoughts, in human learning situations language has the main position, but in many developing countries a great number of children enrolled in those institutes where they cannot communicate in the instructional language of the classroom. Around the world, almost 221 million students communicate in different languages from the instructional language, which is being spoken in the schools. For effective teaching, it is necessary to teach them first in their mother tongue and after that, introduce the national, official, or foreign tongues. It is very difficult for the learner to learn and perceive in an unknown language or any other tongue which is not used for communication at their houses or in their environment, which is the reason for lack of their success in courses or quitting from the school. That causes a great loss to the country and the individuals. UNESCO, the World Bank, the world declaration on education for all, the UN General Assembly's Convention on the Children's Rights all the international forums have emphasized to teach students at the minimum class 5th using native language as the communication language in the classrooms. Tariq (2014) suggested that native language base schooling greatly increases students' abilities.

[Omoniyi & Olabode \(2013\)](#) conducted a study on Nigerian primary school pupils for the usage of native language and mathematical language in mathematics subject. The study suggested that the native language should be used in mathematics teaching at the primary level. [Espada \(2012\)](#) quoted Mimaropa, (2009) that teaching in the native language is being considered to be the most convenient and rapid method of producing a powerful base in mathematics. The researchers explored the effectiveness of the native language while teaching kindergarten mathematics. It was suggested that the preschool students, taught in their native language performed better in mathematics than taught in English.

[Mahlasela. \(2012\)](#) investigated the role of mother tongue for the enhancement of the learning ability of learners in science comprehension. The result of the study showed that the group who watched videos subtitle in the mother tongue showed improvement in recalling as well as in science comprehensions.

[Hassanzadeh, et al.\(2011\)](#) emphasized the importance of native language by stating that language is a productive portion in the instruction and if it is retained and back up in the teaching background. [Sabri, üstünlüoğlu, & Aysel, \(2005\)](#) found that when the concept of "Energy" was taught to the students in the Turkish language their misconceptions were less as compared with when they were taught in a foreign language, English. [Ndamba \(2008\)](#) suggested that change in attitude is required to realize the fact that mother tongue has its significance in learning and all stakeholders should start a serious campaign to promote and appreciate the role of mother tongue in the starting periods of learning.

Materials and Method

Methodology

The research design of this study was Quasi-experimental. This study was carried for 4 weeks. The class instructor was briefed about the mode of instruction for each group (experimental or control group). The language of instruction, communication, and learning for the experimental group was the native language or first language of students (Pashto language). While the language of teaching, communication, and learning for the control group was the national language, i.e. Urdu, the language spoken by the class teacher. The time spent with both the experimental group and the control group was 35 minutes for each class six days a week. At the end of the experiment of the research study, a post-test was taken from both the groups.

Initially, a pre-test was taken from all the participants; then students were taught using the Urdu language in the control group. After that, a post-test was taken. On the other side, the experimental group was taught in the Pashto language (their mother tongue) and post-test (with a small change) was taken to find whether science learning could be improved using mother tongue as a medium of communication at the elementary level at Swabi KPK.

Population and Sample

The population of the study consisted of all female students of grade 8th studying in government schools in Khyber Pakhtunkhwa. The researcher selects respondents by the convenient sampling method. The research was conducted on the section of students already formulated section of grade 8th. The sections served as the control group and the experimental group. There were 25 students in each section. The age range of students was 11-14 years. The sample consisted of only female students. The socioeconomic status of the parents of sampled students ranged between 15,000-58,000 Rs, per month.

Instrumentation

For the collection of data from the selected schools, a test was developed by the investigator for pre and post-test. To find the previous knowledge of the participants, a pre-test was taken from the group in both groups, before treatments. After the intervention in each group, a post-test was taken with little modification, just to find the progress of both groups. General Science textbook was used for instruction. The researcher constructed the tests from the General Science Grade 8th. The researcher chose two chapters for this experiment. The tests consisted of knowledge, understanding, and application levels of Bloom's taxonomy. There were 18 questions, six from each domain of Bollm's taxonomy. The duration of the tests was 40 minutes. Students had to write the answers to the given questions on the answer sheet. After developing tests, the validity was assured by science teachers teaching in the same school. After their feedback and recommendation, the modified and final version of the tests was approved. The reliability of the test was assured by the test and retest method to get an accurate score and to check the reliability of the test.

Data Analysis

To test the hypothesis, the participant's scores in both the tests were collected and analyzed using the paired sample t-test to find the differences in learning capabilities before the treatment and subsequently after the treatment to the experimental and control group. The results are given in the following tables with a brief explanation.

Table 1. Comparison of Pretests of Control Group and Experimental Group

Group	N	Mean	Std.Dev	df	t value	Sig.
Control Group	25	8.84	1.21	24	.116	9.08
Experimental Group	25	8.80	1.19			

From table 1, the pretest score for the control group was (\bar{X})= 8.84, SD = 1.21, while the mean for the

experimental group was $(X) = 8.80$, $SD = 1.19$. The calculated t-value is $t = .116$, $Sig = 9.08$, $p < 0.05$ (2tailed). It showed that while there was no significant difference in the students' scores of experimental and control groups in the pre-test scores.

Table 2. Comparison of Posttests of Control Group and Experimental Group

Group	N	Mean	St.Dev	df	t value	Sig.
Control Group	25	18.08	1.63			
Experimental Group	25	22.08	2.90	24	-6.030	0.00

From table 2, the mean for the control group had a score of 18.08 in the post-test, while the mean for the experimental group was 22.08. The standard deviation for the two groups was 1.63 and 2.90, respectively. The calculated t-value was -6.030, and the significance value was 0.00, which is less than the p-value of 0.05. Comparison of t-test values showed that while there was a significant variance in the students' scores between the experimental and control groups in the posttest, $(X) = 18.08$, $SD = 1.63$, and $(X) = 22.08$, $SD = 2.90$, $t = -6.030$, $Sig\ value = 0.00$, $p > 0.05$ (2tailed). From this result, it could be deduced that guiding and acquiring knowledge in the mother tongue is effective in improving the science learning capabilities of students at the elementary level.

Discussion

Our results are in line with the study of [Awopetu, \(2016\)](#) who used the native language for communication and classroom instruction language showed really good performance as compared to other groups in which classroom and spoken language is English. However, our research showed dissimilarities with [Awopetu, \(2016\)](#) investigated that in the experimental group in the learning capabilities of boys and girls there was no significant variance in the experimental group the result was analyzed by using t-test which showed that both male and females students revealed significant attainment in their getting knowledge abilities after being taught in the native language.

The findings agree with [Israel, and Thomas \(2013\)](#) as researchers found that participants performed outstandingly in mathematics while they learn in their known language or mother tongue, language help them to remember what they learned and also help to develop vocabularies in mathematics.

The findings of this study are also in line with [Cortez, \(2016\)](#) that if students use their mother tongue as a language of instruction in their classrooms, they comprehend well and their reading skills become better, and questionnaire showed a positive tendency of the students regarding mother language-based instruction in the new curriculum.

This study also showed similarity with [Behrmann \(2018\)](#) that mathematics and science learning of elementary students improves when teaching is being done in the native language. The results of this study are also in line with [Nomlomo \(2007\)](#) that when students were taught in the native language of South Africa, their learning was improved. [Shrazi & Shah \(2016\)](#) were also of the opinion that “mother tongue is the only way out to help students learn scientific courses. Mother tongue helps them understand the concepts, and at the next step, it helps the learner to learn and internalize the vocabulary and scientific concepts”.

The finding of the present study also has similarities with [Kelleher, \(2013\)](#) that the majority of the pupils practice their native tongue regardless of the negative perception which is found in their native language in their surroundings. However, many institutes try to stop the usage of their mother tongue from institutes or ban it, but in vain, 64% of participants believe that a native language can help to learn a second language or foreign language easily but still, 90% of the teachers did not agree that using mother tongue can improve their foreign language skills and do not allow the learners to speak mother tongue in the classrooms, this is not a strange argument because many institutes prohibited the usage of mother tongue in classrooms.

Conclusion

Now a day's, most teachers are confused about either to use a national language or a native language, whether to prioritize the selected language or the native language in the particular situation of the process of teaching. Within this study, we decided to concentrate on this issue in the province of KPK, Pakistan to identify the circumstances in which instructors tend to operate the native language in science teaching classes at the elementary school level. In the theoretical part of this study, we have summarized various arguments and opinions both on the use of the national language (Urdu) and the mother tongue (Pushto) in science classes. Furthermore, we presented the outline of findings from numerous studies focusing on the amount, purposes, and instructors' reliance concerning the application of the native language. It has been discovered that foreign language teachers employ the native language in their classes for various motives and to varying extents. Moreover, there is a difference in the school of thought on the usefulness of the native language. Though, most of the sources commonly claim that operating the native language in science classes and other language classes is useful and significant. In our research, which is the core of the practical part of this study, we dealt with the science teaching teachers at Swabi elementary schools make between the use of mother tongue and national language Urdu. The main aim was to identify the situations in which teachers generally employ the native language in their classes; therefore we observed the same class in two groups to explain some striking features that occurred in both groups and thus to provide a more in-depth look into the overall results. Thus, according to our research, the native language serves better the national language (Urdu) in Elementary Schools.

Recommendations

Teachers must use the mother tongue in translation to make effective two-way communication with students so that misconceptions can be reduced, and science learning can be improved.

Further study can be conducted to find the effect of Pushto on English and other subjects.

This research can be replicated in other districts in Khyber Pakhtunkhwa, to find out mother tongue influence in other areas. Especially in rural areas of Khyber Pakhtunkhwa where the people are not modern and are not able to use the other languages accent properly the native language should be encouraged there as a meaning of instructional and learning basic science and other concepts at least primary and elementary level.

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