

Use of Language and Science Education

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Abstract: *The growth of any country depends upon the growth of science and technology of that country. In the world of knowledge, language plays a vital role in imparting knowledge. Language use in education has been an issue in a multilingual set up dominated by a colonial language, such as English which has become an over pervading effect because of its global stature vis-à-vis regional language/vernacular. A student who had studied up to high school in regional language finds it very difficult to cope up with the science education at intermediate/plus two stage and further on, compared to an English medium student. As a result of this many students drop out of education. Science education at the school level and at the higher education are not in contiguous relationship due to which the students switching over from the secondary level to higher secondary level faces many problems and there are many drop outs every year. They have to deviate from their chosen path and one of the impediments is language issues, particularly switching from regional language medium to English language medium. The paper aims at this issue and need to be addressed properly by administrators, planners, educationists, linguists, etc.*

Keywords: Colonial, Vernacular, Multilingual, Contiguous, Impedements

I. INTRODUCTION

There has been increasing recognition in recent years of the central role of language in both learning science and in developing science literacy, where science literacy is seen as the desirable general outcome of learning science. At the same time, the definition of science literacy has been broadened over the last decade from a traditional focus on technical conceptions and terminology to include skills in communicating science concepts and applications. The American Association for the Advancement of Science (1993) and the National Research Council (1996) emphasized the need to develop students' cognitive abilities, reasoning, habits of mind, unifying concepts, and communication skills. The National Science Education Standards (NRC, 1996) asserted that science literacy entailed the development of educated citizens who can "engage intelligently in public discourse and debate" (p. 13), can "construct explanations of natural phenomena, test these explanations in many different ways and communicate their ideas to others" (p. 20). In supporting this general orientation, Hand, Prain, Lawrence, and Yore (1999) asserted that an explicit focus on using language for communicative purposes was crucial to achieving this broadened account of science literacy. Over the last fifteen years there has also been strong interest in the role of language in learning science. This interest parallels Christie's (1981) account of how language and learning are connected generally. Christie (1981) claimed that learners can learn through a language, learn about a language, and also learn how to use a language. In the first relationship, or learning through a language, language is understood as a resource for understanding new content, where use of everyday words and concepts enables learners to explore and clarify the meaning of technical terms or new concepts. In this sense, the learner's current language competencies provide a means to develop new understandings, new vocabulary, and new language practices. In the second relationship, or learning about a language, learners study a language as a system, as in learning the history, linguistic structures.

II. ENGLISH AS A LANGUAGE OF SCIENCE AND TECHNOLOGY

English is the universal form of communication in science. Although many countries still publish journals in their native tongue, English is currently the best way to share one's research findings with scientists in other parts of the world. But how did this come about? During the middle ages, Arabic was the language used for science in all Islamic countries, while Latin was the primary form of communication among scientists in Europe. Later, German, French, Italian, and English were all used in their respective countries, and often came to be associated with a particular discipline, e.g. German with physics or chemistry. The dominance and use of these languages changed over time,

depending on the growth and decline of science, which was dependent on the economic state and culture in each country.

Thus, French declined after WWI as German became more dominant, and after WWII English replaced German. As the U.S. became a global leader in technology and research, English remained the primary form of communication among scientists. During the 1920's, the need for a universal language was proposed, and a new language, Esperanto, was created for this purpose. But it was somewhat impractical and never caught on. Instead English became a universal language of science, technology and business.

III. BENEFITS VS DRAWBACKS

There are of course many benefits to having a universal language. The most obvious advantage is that results can be more widely accessed, and scientific exchange between countries is significantly enhanced. However, we must also consider the drawbacks. Primarily English as a language of science and technology puts non-native English speakers at a clear disadvantage compared with native speakers when it comes to writing and promoting interest in their research. It also makes it more challenging to evaluate a scientific study based purely on the findings. Lack of clarity can take away from even the most interesting study. Imagine if Einstein's *Theory of Relativity*, for example, was available only in a poorly translated version for non-German speakers!

Consequences of the Use of English as the International Language of Science

While having a "universal language of science" has allowed scientists to communicate ideas freely and gain access to global scientific literature, the primary use of a single language has created barriers for those who are non-native English speakers. For example, writing manuscripts and grants, preparing and presenting oral presentations, and general communication in English is much more challenging for scientists with English as a Foreign Language (EFL) (Ramirez-Castaneda, 2020). EFL speakers report that the quality of English in their manuscripts under review, not the scientific content, is the primary target for criticism, limiting access to a fair chance at publication (Drubin and Kellogg, 2012). This English-only phenomenon creates challenges and gaps in the transfer of knowledge between communities (Amano et al., 2016).

Scientific discourse carried out in the native language of a target audience yields greater participation, motivation and optimism, and leads to stronger connections to concepts in the native culture (Manzini, 2000). Yet, most scientists today feel pressure to publish their papers in influential or globally-recognized English journals that are regarded as yielding more citations (Di Bitetti and Ferreras, 2017) and having a higher impact than any in their mother tongue (Bortolus, 2012). On the SCImago Journal Rank, which ranks scientific journals on the citations their articles receive, the top 50 journals are published in English. Due to the hegemony of English-language science, the desire to publish in respected English journals has prompted journals that previously published in local languages (e.g., *Animal Biodiversity and Conservation* in Spain, *Natureza & Conservação* in Brazil) to severely decrease or even cease publishing in their local language(s) to increase reach within the global scientific community.

There are ingrained systemic biases within larger institutional bodies (e.g., tenure requirements at universities or publication expectations at granting agencies) pushing scientists to publish work primarily in English (Bortolus, 2012). Similar biases and financial pressures in newsrooms worldwide contribute to the dominance of English in scientific journalism. However, as a consequence, scientific knowledge originating from non-English speaking countries (or pertaining to these regions) is not available in the local language(s). This means that for an individual, or entity, not knowing English limits their access to scientific information (Amano et al., 2016). Learning a new language is not always feasible; many communities do not have access to the educational tools and financial resources needed to learn a new language. In Colombia, high English-proficiency among scientists positively correlates with high-socioeconomic status (Ramirez-Castaneda, 2020). In addition, the time spent learning that language could be used instead for other purposes (e.g., conducting scientific research). Thus, the predominant use of English in science contributes to the widening of social and scientific inequities worldwide.

Problems with regional language influence on English speaking persons

It was observed in the classroom that majority of students did have Regional language influence in their spoken English. The students were not confident while speaking English and they were having problems of pronunciation, intonation

and stress on words while speaking English. Students were not having much hold on the language. The overall decorum of the classroom was not very enthused with a spirit of studying English. The students were hard working but owing to socio cultural background, they required more support in learning to speak English accurately and with minimum flaws. The problems that students face in acquiring proficiency were that they do not understand the meaning of the words, and the way to pronounce the words correctly. Moreover they have low speed while reading. English speaking skills are not emphasized during the primary stage by the teachers. Students do not possess much knowledge of what ought to be accurate proficiency, putting stress on words and having different intonation and fluency while speaking English. e. English speaking sessions are not conducted by teachers in the school. . Whenever require extra/remedial classes of spoken English are not taken.. Aspect of Regional language influence in spoken English is often ignored by teachers. No specific efforts are conducted to rectify the regional language influence on spoken English of students. Less emphasis is on English speaking skills; instead other skills of reading and writing are emphasized. Audio- visual aids like lingua phone, CDs and so on are not used by the school to enhance student's spoken English. The socio cultural background of students does influence their way of speaking English and as they do have their regional influence while speaking English.

IV. CONCLUSION

The use of a universal language to communicate in science is unavoidable. Although English has gained its status without going through a true democratic process, having a universal form of communication does allow for a wider scope and better understanding which ultimately leads to scientific progress. English as a language of science and technology will continue while the U.S. dominates research in those fields, but as we know from past experience, this situation could very well change again. The overall conclusion of this study is that the majority of students do have regional language influence on their spoken English. There are various socio cultural considerations, lack of awareness of correct pronunciation style, lack of practice and many more which become the cause of regional language influence on spoken English. efforts should be put forth to enhance English speaking skill, this in turn would enable the students to understand correct pronunciation, avoid regional accent and speak in correct and beautiful way. More emphasis could be given on strategies to enhance English speaking skills. Usage of Audio-Visual aids by the researcher to acquaint students with them, like linguaphone, language laboratory etc.. The study mainly focused on Regional Language influence on speaking English ability of students. The study deals with only with improving the skill of speaking English.

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