STREAM Learning Approach for Multilingual India

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Abstract

Teaching in a multilingual classroom has always been challenging for teachers, particularly in delivering instructions effectively. The challenges are pronounced in early education. Managing the multilingual environment of a classroom has never been easy for the teachers and students. Mother tongue-based education has been the most recommended approach in the multilingual world. Therefore, policymakers in a welfare state cannot deny this, especially in a democratic set-up like India. The New Education Policy (NEP) 2020 (Government of India, 2020) in India has reaffirmed that mother tongue education will be provided at least at the primary level. The STREAM educational approach has aroused global interest and may benefit multilingual classrooms with its collaborative approach. Combining STEAM with R (reading and writing) aims to provide students with the excellent communication skills needed to address critical problems.

Keywords: Multilingualism, STEM, STEAM, STREAM

Introduction

The fundamental component of unequal social and economic stratification is undoubtedly education. Understanding the mutually reinforcing relationships between language use, uneven opportunities, and increased social and economic inequality requires an understanding of the language and culture of diverse societies. Multiple languages must be taught in the school curriculum due to India's multilingual, multiethnic, and multicultural nature. A competing ideological framework for linguistic diversity in education has evolved, emphasising the value of instruction

in the children's native tongue for academic performance, which has been advocated by UNESCO (2022). This idea received special attention from UNESCO's (1953) report, stating, "It is axiomatic that the best medium for teaching a child is his mother tongue" (p. 11). The Indian Constitution has always been supportive of mother tongue education, and NEP-2020 has affirmed the same. The foundational idea of Indian educational policy is the three-language formula, which was developed in 1957 and states that every child should receive instruction in a regional language or tongue before adding English and Hindi to their curriculum. The National Curriculum Framework also emphasises the significance of mother tongues for children's education. It defines these languages as "the languages of the house, larger social group, street, and neighborhood, i.e. languages(s) that a baby acquires naturally from her/his home and societal environment" (National Council of Educational Research & Training, 2005, p. 36). This argument in favour of Multilingual education was founded on an ideological view of education that emphasised the development of human capital as the primary goal of education. According to studies (Axelsson, 2005; Biagioli, 2021; Thomas & Collier, 2002), adding multiple languages to the school curriculum is not seen as a burden by those involved in child education. However, students face several challenges in achieving their goals in the pedagogical, academic, and environmental domains. The most significant among them, in descending order of difficulty, are: pedagogic—it is confusing to learn the grammar of different languages; environmental—no opportunity to practise the language and no extra instruction at home; and curricular—many other subjects to learn. As beneficial as multilingualism might be in life, it poses a significant challenge to teaching. Policymakers face challenges in dealing with multilingual classrooms in mother-tongue education. The objective of the currently announced NEP-2020 is to provide a multilingual, multidisciplinary, and interdisciplinary liberal education to every aspirant. Because the approach integrates Languages, Arts and Sciences, students do not have to choose courses to get degrees.

Challenges of Multilingual Classroom

Multilingualism is a fact of society, and globalisation has made cross-lingual and cultural dialogue essential. However, when numerous languages are a part of life and a condition of existence, limiting language use is inconvenient, and relying on just one language is inefficient and

ridiculous. People who attend our contemporary school system are often monolingual in the language of the majority. Pattanayak (1981) asserts that using only one dominant language as the medium of teaching results in low success levels in the dominant language itself and renders thousands of youngsters illiterate due to speaking mother tongues that are different from the dominant language. Language is a significant reason for school dropouts, academic stagnation and illiteracy. The disparity between the language used at home and school is one of the features that makes minority children unique. When a child's language is ridiculed and condemned in school, they tend to feel inferior. No educational strategy is used to assist them in being fluent in the school's language to study and achieve on par with the pupils speaking the majority language. This affects their personality. The language then becomes the cause of a failing educational system. Discrimination is a result of reduced opportunity and social standing, which is indirectly caused by language (Pattanayak, 1981).

Multilingual classrooms are not the same as multilingual individuals. The most challenging task for educators and learners globally is managing multilingual classrooms. Both teachers and pupils deal with a range of challenges because of the many local languages that students speak in the classroom. Learners from various linguistic origins sit together in a multilingual classroom setting, but they may or may not be able to converse with one another. The teacher finds this difficult since she is unable to instruct pupils who do not comprehend the language she uses. It might be tough for teachers to deal with the issues in multilingual classrooms. Even after repeated exposure, many school-age children struggle to understand basic English sentences and are reluctant to use English in conversations. The fear and anxiety students experience in a multilingual classroom is another issue. Students feel uneasy in speaking, listening, and studying in second languages. They worry that their peers or the teacher will make fun of them if they say something improper. These hysterical symptoms show that pupils are uncomfortable in a multilingual classroom because they cannot express their feelings. Low proficiency in the English language increases the likelihood that students may listen in class without actively participating in discussions or activities. Another problem with teaching in a multilingual classroom is that assessments are often completed in English, an international language that many children are not fluent in. Another problem is that

schoolteachers are not given enough chances to engage in inclusive, multilingual instruction. Professionally trained and groomed teachers are more equipped to manage multilingual classes than unprepared teachers who must work extra hard because of the range of languages spoken. Teachers who work in multilingual classrooms should be adequately trained to handle these difficulties.

From STEM to STREAM

The USA began to focus on enhancing students' performance in PISA assessments. In this regard, they attempted to improve their science and maths skills and further incorporated engineering and technology. STEM (Science, Technology, Engineering, and Mathematics) was previously known as SMET (Science, Mathematics, Engineering, and Technology), a term coined by the National Science Foundation (NSF) during the 1990s (Sanders, 2009). Its introduction into the classroom aims to provide students with current information in related areas so they may satisfy societal needs and push the boundaries of human thinking and problem-solving skills, perhaps leading to meaningful growth and better living (Vilorio, 2014, p. 3). According to employers and educators, STEM misses a vital component, the creative pieces (Liao, 2016, p. 45) that are essential for students to develop their careers. This led to the introduction of STEAM, which integrates the Arts into STEM (Liao, 2016, p. 44). Sousa and Pilecki (2013) argue that science and art are complementary. Science offers the instruments required for scientific research to produce art, whereas art gives creativity and the ability to the scientific process. When artistic disciplines were included to deliberately use innovative thinking to produce beautiful items as well as problem-solving designs, a paradigm shift occurred. Countries like the USA, Korea, and China, have begun creating the STEAM curriculum (White, 2014). Root-Bernstein and Root-Bernstein (2011) contend that reading and writing are essential cognitive skills and that simply adding art to STEM subjects is insufficient. Writing is seen as another kind of art in STEM education because it is a tool for thinking. Reading, writing, and analytical thinking are the basis of the development of learners. Including reading and writing in any educational programme, including STEM and STEAM, is crucial. Therefore, STREAM came into play. Foti (2021) tries to lay out a strategy for applying the ST(R)E(A)M method to education. Writing helps students understand concepts better, particularly when

writing in groups (Sun & Zhong, 2023), fostering critical thinking and creativity, making learning deeper. Research has indicated that pupil's cognitive building is greatly aided by reading and writing (Simpson et al., 2015). This indicates that greater learning outcomes can result from reading and writing integration in the educational process (Kaya et al., 2023). It allows instructors to supplement their lessons with activities from science, technology, reading and (w)riting, engineering, and mathematics, fostering active involvement, critical thinking, teamwork, creativity, and the growth of abilities crucial for the development of tomorrow's citizens. Therefore, it is crucial to learn more about this approach.

How Can STREAM Be Helpful?

The STEM, STEAM, and STREAM programmes place a strong emphasis on integration. With this approach, students will be given an innovative and all-encompassing learning experience while attempting to dissolve barriers across other courses. Instead of teaching courses in discrete subjects, lessons are well-rounded, project- and inquiry-based, making learning interdisciplinary. Critical thinking, problem-solving, and experiential learning are emphasised in the newly emerging STEAM/STREAM programmes. These are excellent teaching and learning methods because they match with how people function and solve issues in daily life. Students' cooperation, inventiveness, and originality are also encouraged. A flexible, integrated, and well-structured learning environment is essential for teaching these approaches to facilitate learners' comprehension, engagement, collaboration, and successful completion of the course. Modern educators must change from making learning closed and passive to creating environments that are open and participatory. They are expected to act not just as guides but also as a facilitator, mentor, helper, leader, inspirers, and role models for learners. Since the STEAM/STREAM learning approach fosters equal opportunity and offers meaningful learning experiences, it has proven advantageous for everyone in the classroom, including those with impairments. Researchers have explored the relationship between students' writing attitudes and rhetorical writing patterns to promote academic literacy. Education in science and STEM fields, as well as engineering, benefits from language use. In this approach, learners collaborate and work in groups, in project-based learning (PjBL), problem-based learning (PBL),

or inquiry-based learning. During the collaboration, learners deal with language and cultural gaps within societies and linguistic communities.

Conclusion

Language is fundamental and crucial to the holistic development of learners. Knowing many languages helps learners to communicate well and face global challenges. Multilingualism, literacy, and multiculturalism offer numerous benefits in today's global society. Being multilingual can help learners in a number of ways, including postponing the onset of cognitive ageing, obtaining college credits, and receiving a better job offer. Three essential components of learning are the arts, writing, and reading. STREAM is the combination of STEAM and skills such as writing and reading, which guarantees that pupils have acquired the ability to communicate effectively. Reading and writing are increasingly fundamental components of acquiring new knowledge, and STREAM integrates these abilities into the contemporary STEAM education system to create a well-rounded learning experience. This approach to learning breaks the boundaries shaped in the name of language and culture through pedagogical intervention in a very routine manner since childhood.

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