Aligning Higher Education to NEP by Introducing Learning in Mother tongue

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Abstract— India's National Education Policy (NEP) is an ambitious plan to improve the country's educational infrastructure and help students grow holistically. A central tenet of this approach is the promotion of instruction in the mother tongue at all educational levels. This study emphasizes the importance of higher education in the mother tongue as advocated by the NEP. Furthermore, we focus on the necessity of incorporating regional languages into engineering education to align with this educational approach. The advantages of teaching in one's mother tongue in higher education are outlined, along with some of the difficulties that may arise. This article synthesizes the literature and provides evidence for the cognitive, sociocultural, and linguistic benefits of utilizing a student's mother tongue as the medium of teaching in higher education. Additionally, the ways in which this strategy can improve students' understanding, critical thinking, and overall academic achievement are investigated. In order to put into practice the goals of the National Education Policy, a pilot project was conducted to examine the effects of providing education in Marathi for aspiring engineers. The project's goal was to learn more about the efficacy and practicality of incorporating mother tongue-based learning in higher education by analyzing academic achievement and talking to students. The results of the pilot research provide useful insight into discussions about bringing higher education in line with the NEP through the use of mother-tongue education.By adopting this approach, India can better prepare its students for the opportunities and challenges of the 21st century.

Keywords— National Education Policy (NEP); Multilingualism; Educational reform; Mother tongue education

I. Introduction

The country's native language is typically used for technical and scientific training and instruction. China, Japan, Germany, Taiwan, and many other countries with advanced technical capabilities have shown that technical competence and perfection may be achieved best in mother - tongue, unaffected by English or any other foreign language (Cheney, Ruzzi, and Muralidharan, 2005, Dekker and Young 2005). It has been established that knowing one's mother tongue has positive benefits on social inclusion, literacy rates, and poverty alleviation, in addition to promoting a broader imagination.

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India is home to almost 1.4 billion people, and its population is its greatest asset. There are 270 distinct first languages, spoken by people of the 121 different language families. The 22 languages included in the Eighth Schedule of the Indian Constitution are spoken by about 97% of the country's total population. Data suggests that the usage of Indian languages contributes significantly to India's GDP (82.73 percent). The research recommends that such empirical data be used as the foundation for language planning in India.

The National Education Policy (NEP) 2020 emphasizes Multilingualism and Power of language. Education in regional language should facilitate learning for all students with multiple pathways involving both formal and non-formal education. Scientific studies say that grasping non trivial concepts in mother tongue is easier. Hence NEP promotes education in regional languages.

From Academic Year 2021-22, All India Council for Technical Education (AICTE) has permitted B. Tech program to be taught in 11 regional languages in 14 engineering colleges across 8 states in India. AICTE has also developed an AI tool for translating Engineering course in 11 languages. This emphasis on mother tongue as the medium of instruction is expected to instill confidence in the students from poor, rural and tribal background.

Our study aimed to explore the impact of teaching technical courses in Marathi on students' understanding of the concepts. The primary focus was to determine whether delivering lectures in Marathi, the native language for many students, would enhance their comprehension of complex technical ideas.

2. Related Work

Technical education in regional languages is an important aspect of promoting equitable and inclusive education in diverse societies.

Research conducted between 1970 and 1978 as part of the Education in Mother Tongue: The Ife Primary Education Research Project sought to create a curriculum that would encourage the use of native languages as a medium of teaching in primary schools across Nigeria (Ejieh, 2004). Researchers at the Institute of Education at what is now Obafemi Awolowo University in Ife, Nigeria, worked with the federal government of Nigeria on this project.

The study was founded on the theory that teaching a child in his or her native language would improve that child's ability to comprehend the material and perform well in school. The researchers commissioned a series of investigations to determine whether or not teaching in native languages would be beneficial in primary schools.

The study project consisted of multiple stages, including curriculum design, teacher training, and curriculum implementation in a subset of elementary schools in Nigeria, all of which made use of local languages. The researchers also evaluated the project's success, finding that teaching in students' native languages boosted their grades and encouraged them to take pride in their heritage.

The project was pioneering in its advocacy for the use of local languages in basic education in Nigeria and has since served as a template for similar efforts in other African nations. The success of the programme helped spur legislation in Nigeria and elsewhere in Africa that mandates the use of native languages in primary schools.

The work of (Mestry, Hendricks, and Bisschoff, 2009) examined the pros and cons of teaching students in their mother tongue in South Africa. The study includes both a literature review and a case study of a mother tongue education program at a South African primary school. The study's findings indicated that learning in one's mother language could boost a person's academic performance, student engagement, and sense of cultural pride.

However, the study also revealed certain challenges connected to mother tongue education, such as inadequate funding and teacher preparation. In spite of these obstacles, researchers found that mother-tongue instruction could have a major impact on students' academic performance and cultural acceptance in South Africa.

A book by (Benson, 2005) provides an in-depth look at the value of teaching students in their mother tongue. This book is grounded in in-depth study of the cultural and linguistic contexts that shape the decision to teach in the student's mother tongue at school in the region.

Lack of resources, political and societal impediments, and linguistic standardization issues are only some of the difficulties and restrictions that are

discussed in this book. Bamgbose suggests doable answers to these problems, such as educating teachers, creating new curricula, and involving the community.

Multilingual education in India is analyzed in depth by (Skutnabb-Kangas et al. 2009). While the article realizes the value of learning multiple languages, it argues that the current education system in India places too much emphasis on English and Hindi at the expense of local languages.

The author draws attention to the injustices that result from this linguistic hierarchy, namely how it prevents kids who only speak local languages from receiving a good education. The article stresses the necessity to foster multilingualism in schools to improve learning outcomes and maintain linguistic diversity, as well as the relevance of mother tongue education.

Problems with language standards, inadequate teacher training, and scarce resources are only some of the obstacles that the paper highlights as obstacles to multilingual education in India. The author suggests developing multilingual textbooks and teacher training programs as concrete ways forward.

The author of the article discusses the pros and cons of teaching courses in a student's mother tongue. Teaching subjects in a student's mother tongue is essential for optimal learning, cultural maintenance, and individual development.

Possible advantages of learning one's mother tongue in school include enhanced cognitive growth, enhanced academic performance, and enhanced socialization. However, implementing mother tongue education is difficult because of factors such as a lack of funding, the need for standardized orthographies, and a scarcity of qualified educators.

The paper emphasizes the need for context-specific and culturally-relevant mother language education programs that can be maintained throughout time.

There are many facets to the significance of one's mother tongue. It's crucial for a child's overall development because of the impact it has on their thoughts and emotions. There are many benefits for a child to master his or her mother tongue. It promotes cognitive growth, strengthens connections to one's heritage, and makes it easier to pick up new languages. From before birth and forward, a child's first and longest-lasting source of language knowledge is the language spoken by his or her mother. Many kids in third world countries aren't getting a good education because they're being taught in a language they don't understand. As a result, engagement is low, students feel alienated, and they are more likely to drop out or have to start over. Policies promoting the use of native languages in instruction have been shown to boost student achievement. Models of early childhood education that fail to account for children's native language may have a detrimental effect on their development and education. Providing students with the opportunity to learn in their mother tongue has been shown to improve both instruction and retention, especially in the early grades.

The challenges of enforcing Kenya's language-in-education policy, which encourages instruction in mother tongues, are the focus of this research. The policy has the potential to increase the availability and quality of primary education, particularly for underprivileged and minority groups, by making it more culturally relevant and accessible on a local level. However, it has not been widely adopted. This paper uses a literature review, ethnographic studies, research outcomes, and interviews with linguists and sociologists to argue for the need for increased funding, political support, and clearly defined policy goals in order to implement an effective education system that makes use of mother tongues in Kenya.

The book (Fortanet-Gómez, 2013) offers a remarkable international perspective on the use of multiple languages in higher learning. It presents a case study of a policy on multiple languages that uses the CLIL method (Content and Language Integrated Learning) in practice. This book provides an overview of various methods for teaching multiple languages, such as content-based integrated language learning (CLIL), and then makes some suggestions for a multilingual language policy at Universitat Jaume I in Castelló, Spain. This article examines the merits of bilingual education and assesses the results of current language policies.

The paper (Paul, Bhimali, and Aithal, 2017) examines the efforts of the All India Council for Technical Education (AICTE) to enhance the standard of India's technical education system. The National Institutional Ranking Framework (NIRF), the National Board of Accreditation (NBA), and the

Margadarshan Scheme are just a few of the AICTE initiatives discussed in this article.

The paper also addresses the difficulties experienced by the AICTE in carrying out these programs and offers solutions to these issues. To improve technical education in India, the author stresses the significance of industry-academia collaboration, faculty development programs, and a curriculum focused on research.

The table 1 highlights the benefits of mother tongue education, but common challenges like inadequate funding and teacher training persist. Gaps remain in large-scale, long-term studies, especially in higher education and technical fields.

3. Advantages (objectives) Of Learning In Mother Tongue:

Researchers have found that when people are exposed to new information in their mother tongue, they learn more of it. Generally speaking, students perform better on exams when the material is presented in their mother tongue in which they are fluent.

A. Student feel more confident and comfortable

This is due to the fact that language is the foundation on which all other knowledge is built. Students gain a sense of comfort and confidence in their learning when they are taught in their mother tongue because they are better able to understand the concepts and express themselves.

There is evidence that early on in their schooling, students who are taught in their mother tongue have a greater chance of academic success [Young and Igcalinos (2019)]. This is due to the fact that first-language learners are better equipped to acquire and apply literacy and language skills in subsequent languages.

Another way in which learning one's mother tongue helps to protect one's cultural heritage is through the transmission of language skills. It helps students connect with their heritage and improves their ability to communicate with those around them.

B. Critical thinking in students increases

The ability to analyze and comprehend complex

Table 1 :
Comparative Analysis of Studies on Mother Tongue and Regional Language Education

Study/Research	Country/ Region	Key Focus	Advantages	Challenges	Proposed Solutions
Ife Primary Education Project (Ejieh ,2004)	Nigeria	Native languages in primary education	Better comprehension, academic performance, cultural pride	Lack of curriculum, teacher training, limited implementation	Teacher training, local language curriculum
South African Study (Mestry, Hendricks, and Bisschoff ,2009)	South Africa	Mother tongue instruction	Improved performance, engagement, cultural pride	Inadequate funding, poor teacher prep	Teacher training, community involvement
Bamgbose's Book (Benson ,2005)	Africa (general)	Cultural and linguistic context of mother tongue	Cognitive growth, academic boost, cultural identity	Resource constraints, political barriers, standardization	Teacher training, curriculum development, community input
Multilingual Education (Skutnabb-Kangas et al. 2009)	India	Emphasis on Hindi/English over local languages	Preserves diversity, improves learning, cultural relevance	Neglect of local languages, poor teacher prep, lack of resources	Multilingual textbooks, teacher training
Kenya's Policy (Fortanet-Gómez 2013)	Kenya	Mother tongues in primary education	Culturally relevant, benefits underprivileged groups	Political support, funding, inconsistent policy	Increase funding, clear policy goals
CLIL Method (Paul, Bhimali, and Aithal ,2017)	Spain	Bilingual education via CLIL	Integrated content and language learning	Policy implementation, teacher prep	Multilingual policies, research-based curriculum
AICTE Initiatives (Young and Igcalinos ,2019)	India	Improving technical education in regional languages	Enhanced standards, focresearch-used curriculum	Collaboration gaps, faculty development	Strengthen industry-academia links, faculty programs

concepts is a key component of critical thinking, and research has shown that learning in one's mother tongue improves this ability. Students are better able to grasp abstract or complex ideas when they are taught in their mother tongue because they already have a foundational understanding of the language. The ability to analyze, evaluate, and synthesize information is just some of the benefits of learning a new language, along with an improved understanding of the subject matter.

C. Minimizes students burden and saves time of learning

The burden on students and time savings can both be attributed to learning in one's mother tongue. In order to lessen the mental strain placed on students, it is best to conduct instruction in a language that is already familiar to them. As a result, they may be better able to internalize the material and use it in the future. There is some evidence that suggests that learning a language in one's mother tongue can facilitate faster and more thorough assimilation of its vocabulary and grammar. The time spent explaining new concepts can be reduced if the instructor is able to do so using everyday language rather than technical jargon. Learning in one's mother tongue can create a more efficient and effective learning environment, allowing students to learn at their own pace and with greater ease, by reducing the burden on students and saving time. As a result, students are less likely to become frustrated or disinterested in the material being taught.

D. Develops students personal, social and cultural identity

The ability to connect with one's cultural roots and heritage strengthens when students are taught in their mother tongue.

Culture, history, and values can all be passed down through the generations through a child's education in their mother tongue. It helps students grasp the subtleties and complexities of not only their own culture but also those of other communities. Increased cultural awareness, compassion, and respect can result from this [Emerick (2022), Camilleri and Camilleri (2020)].

Learning in one's mother tongue also has the added benefit of fostering the growth of one's social and relational abilities. Students who are fluent in their mother tongue are more likely to develop close relationships with their loved ones, neighbors, and classmates. A person's sense of worth, assurance, and community can all rise as a result.

Learning in one's mother tongue has additional benefits, including increased potential for academic and professional achievement. It is much easier for students to learn new languages and excel in their coursework when they have a solid grounding in their mother tongue. This can give students access to more job options and increase their involvement in the global economy.

E. Concepts learnt in mother tongue do not have to be re- taught when the student transfers to a second language

Concepts learned in a student's mother tongue facilitate profound understanding. Because of this, teachers of the student's second language won't have to spend as much time explaining basic concepts.

It has been shown through studies that learning a language in one's mother tongue facilitates later transfer to other languages. This is due to their superior conceptual understanding, which facilitates transfer of learning between languages.

Additionally, students are better able to draw parallels between the ideas they have learned and the new ideas they encounter in a second language when they have a solid foundation in their mother tongue [Kolesinski, Nelson-Weaver, and Diamond (2013)]. This can accelerate the process of learning and increase comprehension.

A caveat is that there could be terminology and usage differences between languages, and that students might need help adjusting to these. To fully participate in the new language, students may also need to develop language-specific skills, such as grammar and vocabulary.

F. Self-esteem is higher for children learning in mother tongue

This is due to the fact that students are more likely to participate actively in class and retain information when taught in a language in which they are fluent.

Children who are taught in their mother tongue are better able to comprehend the teacher's instructions

and explanations, which lessens stress and frustration [Atkinson (1987)]. A sense of success and fulfillment is associated with higher levels of self-esteem.

It's been shown that learning in one's mother tongue helps kids have better conversations with their educators and classmates. This can result in more students talking to each other and feeling like they have a place in the classroom community, both of which are associated with increased feelings of confidence. In addition, language and literacy development are facilitated when children are taught in their mother tongue. When people feel good about themselves, they are more likely to take pride in their accomplishments.

G. Multilingualism and Socioeconomic Success

This is due to the fact that being able to speak more than one language provides its speakers with numerous advantages in the modern global economy.

First, being able to communicate fluently in more than one language is an invaluable skill in today's globalized world. This can be useful in many fields, such as commerce, diplomacy, and travel [Harbord (1992), Cuartas Alvarez (2014), Paker and Karaağaç (2015)]. More employment possibilities and higher potential earnings are another benefit.

Second, the ability to shift between tasks and ways of thinking is improved by knowing more than one language. Many fields place a premium on problem-solving and creative abilities, which can be strengthened in this way.

The third benefit of learning multiple languages is that it can help you appreciate and understand the world from the viewpoints of those who think and live differently than you do. This has the potential to improve interpersonal relationships and global issues like migration, cultural diversity, and trade. Being able to communicate effectively in more than one language is a valuable asset in today's competitive global economy. This has the potential to improve one's economic standing, salary, and prospects for both personal and professional growth.

It will encourage fairness, literacy growth, poverty reduction, and global unity. The power of language holds the potential to propel forward a more equitable society. Removing existing linguistic barriers will help advance the goal of inclusive governance.

4. Challenges Of Higher Education In Regional Languages

A. Preparation of faculty

Teaching technical subjects in regional languages requires educators who are both comfortable in the vernacular and comfortable teaching in English.

Teachers should be able to communicate effectively in both the vernacular and English because the latter is the language of instruction in many universities and the international business community.

Several methods can be used to train instructors to provide technical instruction in the local language. As a first step, programs for educating educators can be established to better equip them to instruct in both the local language and English. Training in pedagogy, subject-specific training, and language skills are all examples.

Second, educators can work with experts in the field to create lessons that are accessible to students who speak multiple languages. This can help students more easily learn technical concepts by bridging the gap between regional languages and English.

Third, technology can be used to assist teachers in providing technical training in the local languages. This can include both regionally and internationally accessible online materials, educational software, and multimedia content.

Finally, it's crucial to foster a setting that encourages teachers to incorporate regional languages into their lessons and values

multilingualism. Encourage the use of regional languages in school policies, reward educators for teaching in those languages, and cultivate an environment where linguistic diversity is valued.

B. Learning Material Development

Several factors must be taken into account during the development of learning materials for technical education in a regional language if they are to be both effective and accessible to students. Some instances of these aspects are:

Language proficiency: To guarantee that the technical concepts are accurately translated and conveyed, the learning materials must be created by experts who are fluent in both the regional language and English (Met, 1994).

Cultural relevance:The materials must be tailored to the specific cultural context and local practices of the intended audience to be effective.

Pedagogical approach: The materials must be developed with a pedagogical strategy fitting for technical education, including the use of relevant examples, exercises, and activities that give students a chance to put their knowledge into practice.

Learning is facilitated by the incorporation of visual aids such as diagrams, charts, and illustrations to better explain complex technical concepts (Okal, 2014).

Visual aids: Learning materials for technical education in regional language can also benefit from the use of technology, such as the creation of online resources, educational software, and multimedia content.

Accessibility: Materials must be created so that everyone can understand them, regardless of their native language or preferred method of study. Offering multimedia content like videos and audio recordings, as well as games and quizzes, can help with this.

Feedback and evaluation: Constant evaluation and improvement based on feedback from instructors and students is necessary to make sure the materials are useful and accessible to the intended audience.

Language proficiency, cultural relevance, pedagogical approach, visual aids, technology, accessibility, feedback and evaluation are just some of the factors that must be carefully considered when creating learning materials for technical education in regional language. By keeping these things in mind, we can give students an education that is both tailored to their specific area and thoroughly global in scope.

C. Industry readiness to accept students from vernacular batch

The preparedness of the industry to receive students from regional language programs is a crucial factor in technical education delivered in regional languages. Engaging with industry stakeholders and comprehending their expectations and requirements is crucial to adequately prepare students for the workforce.

Establishing partnerships between technical education institutions and industry partners is a viable approach to promoting industry readiness. The opportunities available to students may comprise internships, co-op programs, and collaborative research projects. These avenues enable students to acquire practical skills and hands-on experience that are pertinent to the industry (Okal, 2014, Riasati, Allahyar, and Tan 2012).

It is crucial to ensure that the technical education programs offered in regional languages have a curriculum and learning outcomes that are in line with the industry's needs and requirements. Regular consultations with industry stakeholders and the inclusion of industry-relevant projects and case studies in the curriculum are effective means of achieving this goal [Genesee (2004), Battiste (2000), Moenikia (2010)].

It is crucial to highlight and exhibit the proficiencies and abilities of students belonging to regional language batches to industry stakeholders. The institution can organize industry- specific events, exhibit student projects and accomplishments, and enable networking prospects between students and professionals in the industry.

It is crucial to offer language and communication instruction to students who come from regional language groups to enable them to proficiently communicate and engage with industry experts who may speak diverse languages or have distinct cultural backgrounds (Jha and Parvati, 2020).

5. Government Initiatives to Support the Development of Regional Languages

A. National Education Policy (NEP) 2020

In the recently released NEP 2020 (Jha and Parvati, 2020), instruction in regional languages is prioritized. University-level books in regional languages are being made possible by a grant program funded by the Commission for Scientific and Technical Terminology (CSTT). It was founded in 1961 with the goal of standardizing the technical terms used in India's many languages.

The commission has funded the publication of technical books in regional languages in an effort to address the growing demand for technical education in these areas. Technical book publishers, authors, and academic institutions can apply for grants to help fund the creation of books in regional languages. The commission helps pay for the books to be translated, edited, and printed, and it also promotes and distributes the books to libraries and schools across the country (Aithal and Aithal , 2020).

The CSTT's mission is to equalize opportunities between students who must learn technical subjects in English and those who would benefit more from learning them in their regional language. This program is designed to encourage the use of regional languages in the technical fields and to increase the number of students from rural and remote areas who choose to pursue technical education.

B. National Translation Mission (NTM)

The Central Institute of Indian Languages (CIIL), Mysore is leading the NTM, which is translating textbooks for various disciplines needed in higher education institutions into all languages on the Eighth Schedule. CIIL has been a department of the Ministry of Education since its inception in 1969 Singh, Nair, and Das, 2012).

Policy, programs, and materials for teaching Indian languages are all the responsibility of the Council for Indian International Languages (CIIL). The institute is responsible for translating NTM textbooks across disciplines into regional

languages. The goals of this effort are twofold: to increase the use of regional languages in higher education and to improve educational opportunities for students whose first language is not English.

A group of professionals with excellent English and regional language skills is working on the translation. Experts in the field review the translated textbooks before they are released for use in higher education.

The NTM is part of the government's effort to ensure that all students have access to a high-quality education and to expand the use of regional languages in academic settings. The government is helping to close the language barrier and increase access to higher education by translating textbooks across

disciplines into regional languages.

C. Namath Basai

Schools in rural tribal areas in Kerala have benefited greatly from the "Namath Basai" program, an initiative of the state government that uses vernacular languages as the primary medium of instruction (Ameya).

As part of this initiative, educators are given the tools they need to educate their students using the vernacular language, and textbooks are written in that language as well. The program also encourages parental and community participation in order to provide a more positive learning environment for the students.

In order to combat the marginalization of tribal youth in society, the program prioritizes providing them with an excellent education that takes into account their unique cultural background. The program's overarching goal is to equip these youth with the tools they need to become contributors to their communities' socioeconomic growth.

Students in these outlying tribal communities have shown marked academic improvement thanks to the "Namath Basai" program. The program has increased the number of female students and contributed to a decrease in the student dropout rate.

D. UGC Initiatives

The UGC also supports the "Establishment of Centre for Endangered Languages in Central Universities," which works with nine universities to mainstream regional languages in higher education (Takhellambam, 2022, Devy ,2012).

These institutions serve as meeting places for scholars, linguists, and language experts who are committed to saving threatened tongues. The centers also work to increase regional language awareness and support their use in higher learning.

Courses and programs are available at the centers to meet the linguistic needs of students from a wide range of linguistic backgrounds. In addition, they facilitate the study and recording of regional tongues. To further advance the study and use of regional languages in academic settings, the centers also host workshops, seminars, and conferences.

With this program, the UGC hopes to increase the use of regional languages in higher education and give students the option of receiving their education in their mother tongue. The program is intended to reduce the language barrier and increase diversity in universities.

6. International Initiatives to Support the Development of Regional Languages

A key document in directing the efforts of nations and regions to preserve the world's linguistic richness and diversity is the Yuelu Proclamation, issued by UNESCO at its 2018 conference in Changsha, China (Fang and Ge , 2021).

This proclamation recognizes the value of language diversity and the urgency of protecting dying tongues for the sake of posterity. It acknowledges that the loss of languages is a significant threat to the diversity of human knowledge and to the biological diversity of the planet.

The Yuelu Proclamation urges all levels of government, as well as civil society and local communities, to actively support and safeguard linguistic diversity. It calls on governments around the world to create policies and programs that will help endangered languages survive and encourages the documentation, conservation, and revitalization of languages.

Sustainable development and social cohesion are both emphasized in the proclamation, as is the value of linguistic diversity. It encourages the development of multilingual education programs that allow students to learn in their mother tongue as well as the inclusion of linguistic diversity in educational curricula.

The United Nations General Assembly has declared 2019 the "International Year of Indigenous Languages" (IYIL). The 2019 IYIL is dedicated to preserving and spreading indigenous languages around the world (Schreyer, Granadillo, and Daveluy, 2022).

The United Nations resolution acknowledges the importance of indigenous languages in promoting sustainable development, fostering peace, and fostering reconciliation. A number of indigenous languages are recognized in the resolution as being in danger of dying out entirely.

Through initiatives like language revitalization programs, awareness-raising campaigns, and advocacy efforts, the IYIL works to address these problems by encouraging the use and preservation of indigenous languages. The International Year of Indigenous Languages also hopes to facilitate communication between native groups about how to best preserve languages.

Numerous events were held all over the world in honor of the IYIL by the United Nations and other groups to call attention to the need to protect indigenous languages. The purpose of these gatherings was to spread awareness about the value of indigenous languages and to encourage their use and preservation.

7. Case Study

From Academic Year 2021-22, All India Council for Technical Education (AICTE) has permitted B. Tech program to be taught in 11 regional languages in 14 engineering colleges across 8 states in India. AICTE has also developed an AI tool for translating Engineering course in 11 languages. This emphasis on mother tongue as the medium of instruction is expected to instill confidence in the students from poor, rural and tribal background.

The target group for such B. Tech. programme from Maharashtra are the students from rural area, where Marathi is the primary language. It is observed that as the medium of instruction is English in technical colleges, most of these students simply cram up the syllabus from the books and reproduce it in the examinations.

In the process, the emphasis on understanding is lost. If the students understand the concepts in Marathi, they can remember and apply them better. It is also observed that many students, despite knowing the answer, could not write in exams due to poor knowledge of English.

In spite of above mentioned advantages of learning in regional language and Government initiatives towards education in regional language; there was great dilemma in society to opt technical education in regional language. Apart from the challenges mentioned in section IV all institutions who have been permitted B. Tech programme in regional language have to face one more challenge in form of acceptance

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of all stake holders including students and parents first and then industry as well.

8. Pilot Project

To overcome the all above difficulties, we have conducted a Pilot project with a group of budding engineers. All these students were currently studying their courses in English language. We choose this target group to understand the impact of content delivery in Marathi of some technical courses. The main objective of this pilot project was

i) Testing the impact the mode of instruction in Marathi ii)Ground level discussion with students their understanding if mode of instruction is in Marathi

A. Population of the study

A total of 140 students in their final year of the Diploma Computer Engineering program participated in the pilot project. Students like them were chosen at random from the population to take part in the project and measure the results of providing technical course content in the local language, Marathi.

Approximately 10% (14 students) of the pilot project's students were not from a Marathi background, while 90% (126 students) spoke Marathi at home, as shown in figure 1. This student population diversity allowed us to evaluate how teaching technical subjects in Marathi affected both Marathi speakers and those with no background in the Marathi language.
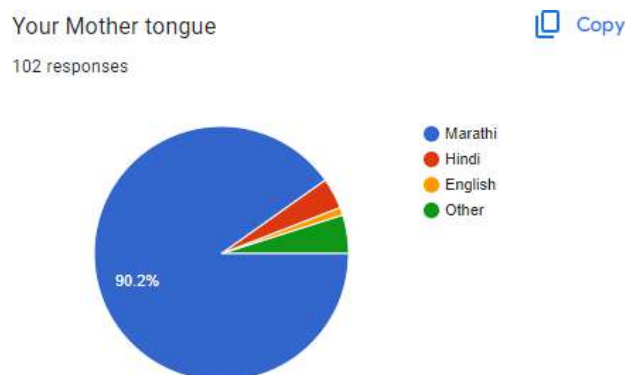
Fig. 1: Mother tongue of the population of study

A total of 116 students (83.3%) were found to be affiliated with the state board, while the remaining 24 students (8.7%) were affiliated with either the CBSE or ICSE boards, as shown in figure 2. According to these numbers, a disproportionate number of students from the state board participated in the pilot project, while only a small percentage of students came from the CBSE or ICSE boards.
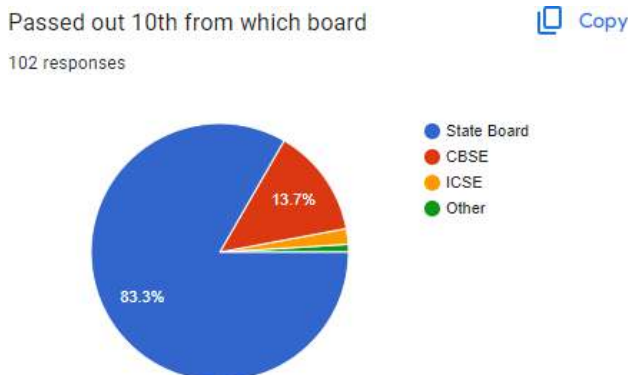

Fig. 2: 10th board of the population of study

Fig. 2. 10th board of the population of study Furthermore, regarding the medium of instruction, 72.5 percent of the students studied Math and Science in English, 21.1 percent in a semi-English medium, and 5.9 percent in Marathi, as shown in figure 3. These results shed light on the linguistic preferences and educational backgrounds of the intended audience, and they help flesh out our comprehension of how content delivery in Marathi for technical courses in computer engineering can benefit the field as a whole.
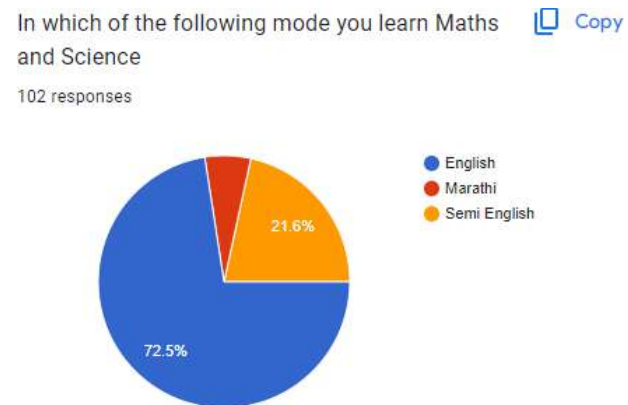

Fig. 3: The medium of instruction of Maths and Science

B. Content Delivery and Understanding

Around 7 Engineering courses were taught to this target group, as shown in figure 4. Mode of instruction was Marathi. This pilot project helped to understand the challenges more extensively at implementation level. Feedback of all students involved in this pilot project were helped us to decide the blended mode of teaching learning to this division.
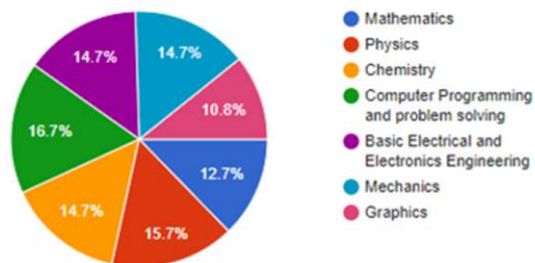
Fig. 4: courses taught to target group

95.1% of the students responded positively, stating that they understood the concepts taught, as shown in figure 5. This shows that the majority of students involved in the pilot project have a solid grasp of the material. Their agreement suggests that the Marathi language content delivery for the technical courses was successful in introducing the concepts to the students and facilitating their understanding.

When asked whether they would prefer to keep learning the subject in Marathi or switch to another language, 73.5% of the students said they would like to keep learning the subject in Marathi. This suggests that a sizeable number of students hold the view that studying in Marathi improves their grasp of the material.
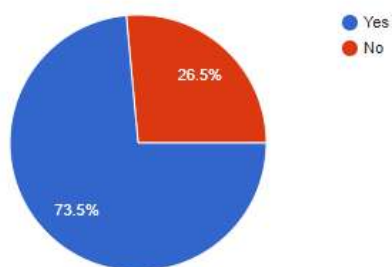

Fig. 5: Response stating courses understood.

Students were asked to rate how well they were grasping the material when taught in Marathi versus when taught in English, as shown in figure 6, and the following responses were given: 36.6% rated their understanding as "best," 27.5% rated it as "better," 29.4% rated it as "good," and 6.9% reported "no change" in their level of understanding. According to these comments, a sizeable number of students found

that studying the material in Marathi enhanced their comprehension. The majority of respondents rated their comprehension as "best" or "better," suggesting that their understanding was enhanced by the use of the Marathi language.
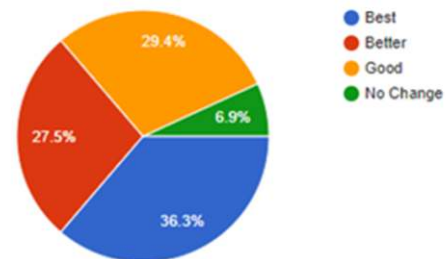

Fig. 6: Response to level of understanding

82.4% of respondents said they now have a better grasp of the topic because it is being taught in Marathi, as shown in figure

7. This shows that the majority of students are in favor of using Marathi as the language of instruction. If they answered yes, this indicates that they gained a deeper understanding of the topic and were able to retain more of what they learned because they were exposed to it in their mother tongue.
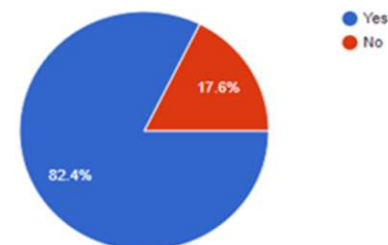

Fig. 7: Response to subject understandability

C. Learning Material Requirement

75.5% of students who were asked about whether they needed supplementary materials (study guides, books, etc.) in Marathi or if classroom discussions were sufficient said they needed supplementary materials, as shown in figure 8. With such a high percentage of students agreeing, it's clear that they need access to Marathi-language textbooks and other

learning resources. Although class discussions are helpful, these students understand the value of having additional resources available to them in their mother tongue to help them better grasp the concepts being taught in class.
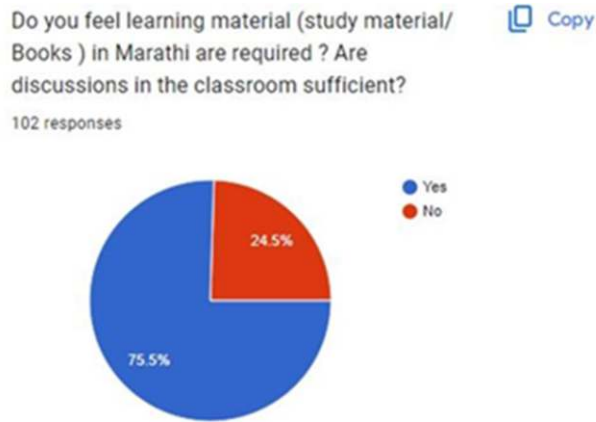

Fig. 8: Response to need of study material in Marathi

According to the responses, 77.5% of students have no trouble connecting what they learn in Marathi class with what they read in an English textbook, as shown in figure 9. This shows that students in Marathi-medium classrooms have a positive impression of the coherence and consistency between classroom instruction and the English-language textbook content. The fact that students can effectively integrate the concepts and information presented in both mediums suggests that they are able to overcome the language barrier and learn and understand the material more thoroughly.
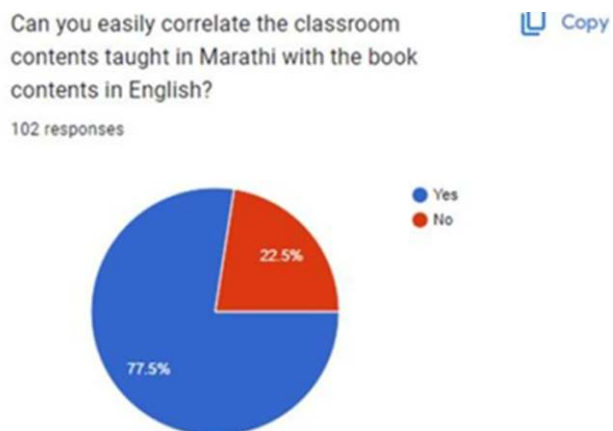

Fig. 9 : Response to relating classroom content to textbook contents.

D. Assessment Language

Students have indicated that a combination of English and Marathi is their favorite assessment language for oral exams and presentations. In this way, students can use both languages to express themselves clearly and completely. The vast majority of students surveyed said they would like to write their theory assignments in English. This decision conforms to the standard terminology for technical disciplines and guarantees uniformity with established examination procedures. The students' linguistic preferences are taken into account and a more all- encompassing evaluation of their knowledge and abilities is achieved through the assessment methodology's use of English for theory papers and a mixed approach for oral exams and presentations.Findings of Pilot Project

E. Inferences of Pilot Project

Some of the finding of this project are mentioned here: Around 94.1% students studied Mathematics and Science in English, still 95.1% students mentioned that they understood the concept taught in Marathi properly. These students were asked to rate their level of understanding for above courses in Marathi as compared to earlier in English. Total 93.2 students rated their answer from good to best. Around 82% students mentioned that content taught in Marathi made the courses more understandable. These feedbacks from students made the teaching in Marathi reliable.

The Marathi content delivery made the technical concepts more easy for these students; still around 70% students mentioned that they would like to write the answers in English instead of Marathi in Unit tests/ exams.

The inferences we received through this pilot project are :

1. Teaching in Marathi made the understanding easier.

2. Technical concepts can be taught in Marathi very easily.

3. Students would like to listen lectures in Marathi for better understanding.

4. Students would like to refer study material in English

5. Students would like to write their examination in English

6. Ix. Future Research Initiatives

The conclusions drawn from our current study have indeed opened up avenues for further investigation and exploration. Here are some specific plans for future research initiatives and potential follow-up studies:

1. Comparative Studies Across Regions: Given the diverse linguistic and cultural landscape of India, we aim to conduct comparative studies across different regions to understand how the implementation of mother-tongue education varies and its impact on students from various linguistic backgrounds.

2. Teacher Training and Pedagogical Approaches: Investigating the effectiveness of teacher training programs in facilitating mother-tongue instruction will be a key focus. We plan to develop and assess specific pedagogical approaches that can enhance the quality of education delivered in regional languages.

3. Longitudinal Impact Assessment: Conduct a longitudinal study to assess the sustained impact of mother-tongue education on students' academic achievements and career trajectories. Follow cohorts of students over an extended period to understand the long-term benefits and challenges associated with this instructional approach.

Conclusion

Instruction in the mother tongue at all educational levels is a central tenet of the NEP. The findings of this research highlight the need for universities to adopt a mother-tongue-based curriculum in order to be in line with the NEP. This article synthesizes the existing literature and provides convincing evidence for the cognitive, sociocultural, and linguistic benefits of using students' mother tongues as the medium of instruction by analyzing the advantages and challenges of teaching in one's mother tongue in higher education. Understanding, critical thinking, and students' overall academic performance are all areas that this study investigates. A pilot project was launched to test the feasibility of educating future engineers in Marathi, one of the NEP's stated goals. The goal of this project was to investigate the viability and effectiveness of mother-tongue- based learning in higher education by analyzing academic accomplishment and conducting interviews with students. The pilot project demonstrated improved comprehension and academic performance among students taught in Marathi, supporting the NEP's goal of promoting mother-tongue instruction. These findings underscore the feasibility and benefits of adopting regional languages in higher education, particularly in technical fields.

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