Theme
Education in 21st Century: Innovations in Teaching & Learning

Welcome !

MSBTE Welcomes the appointment of Hon. Shri. B. Venugopal Reddy, IAS, as the Addl. Chief Secretary, of the Higher & Technical Education Department, Maharashtra State, who is also Ex-Officio Member of the MSBTE Governing Council. The Board looks forward to working with him to strengthen the technical education system in the state with a view to building a system suited to the demands and challenges of the 21st century. It seeks to gain his support and constructive direction in the progressive efforts of the Board. MSBTE extends its best wishes to Shri. Reddy for success in his future endeavours.

Inside....

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Welcome to Shri. Chandrakant Dada Patil, Hon'ble Minister, Higher & Technical Education

Felicitation of Shri. Chandrakant Dada Patil, Hon'ble Minister of Higher & Technical Education, Maharashtra, by Dr. Pramod Naik, Director, MSBTE

MSBTE extends a warm welcome to **Shri. Chandrakant Dada Patil, Hon'ble Minister, Higher & Technical Education, Maharashtra, who serves as the de-facto President of the Governing Council, MSBTE,** on his return to the office. His inclusion in this ministry indicates a dedication to ongoing improvement in Higher & Technical Education and an acknowledgment of the substantial progress achieved by technical education department during his prior tenure. This is an opportune moment to not only celebrate his return but also to extend our heartfelt thanks for the impactful initiatives he has launched to improve diploma education. His commitment to promoting innovation, the incorporation of innovative & modern technologies, enhancing educational infrastructure, improving accessibility, and enriching quality of education has made a lasting impact in the realm of higher & technical education in the state.

One of the most praiseworthy aspects of his leadership was proactive approach to leveraging technology for Educational Advancement and Skill Development', reflected in specific initiatives like the inauguration of a new Skill Development Centre in Ratnagiri, the establishment of **Centres of Excellence** (CoEs) in Emerging Technologies in certain Government Polytechnics, and the creation of state-of-the-art Central Computer Centre in all Government Polytechnics. Among other initiatives, the awareness about incubation activities in partnership with COEP's Bhau Institute in various Polytechnics, and the opening of a Centre for Skill-Based Certificate Courses in Pune. Further, as envisaged in the NEP- 2020, he always encouraged introduction of reforms such as multi-disciplinarity approach, curriculum revision and introduction of need based courses to cater changing global requirements. His eagerness to connect with stakeholders, enquire and address their worries, and work together with national and international level agencies to find solutions for challenges have resulted in tremendous improvement in the quality of technician education. His keenness to implement transparency in the system brought in a feeling of trust and collaboration among the educational community. Looking forward, the challenges confronting the higher & technical education sector are multifaceted and require a visionary approach. We are highly optimistic that his dedicated leadership coupled with his passion for advancement in education, will enable us to tackle these challenges head-on and attain newer milestones based on the groundwork established during his last term.

MSBTE Welcomes You, Sir! We eagerly anticipate that positive impact of your visionary leadership will continue to have a long-lasting influence on technical education system of Maharashtra.

Welcome to Shri. Indranil Naik, Hon'ble Minister of State Higher and Technical Education

The appointment of **Shri. Indranil Naik, Hon'ble Minister of State, Higher & Technical Education, Maharashtra, who serves as de facto Vice President of the Governing Council, MSBTE,** marks the beginning of an exciting new phase in the future endeavours of the Board. MSBTE extends a warm welcome to the Minister of State. There is a sense of optimism about the initiatives and direction he will bring to unleash excellence, foster partnerships, and shape the future of diploma education in the state.

Technician education is the foundation of a strong industrial sector of an economy. It is critical for developing the next generation of innovators and competent supervisory level

Felicitation of Shri. Indranil Naik, Hon'ble Minister of State, Higher & Technical Education, Maharashtra, by Dr. Pramod Naik, Director, MSBTE

professionals who will drive industrial development in the state. We look forward to witnessing Hon'ble Minister's invaluable contribution in the strategic areas like: Improving Quality and Relevance, Integration of latest Technologies, Boosting Accessibility and Equity, Advancing Research and Innovation, Bolstering Infrastructure and Fostering Collaboration & Partnerships within Diploma Education System.

As we welcome him and offer our sincere congratulations, we look forward to his energetic leadership in establishing a more promising future for technician education—one that empowers students and faculties, builds strong educational communities, and in turn benefits our state. We are eager to observe the beneficial effects of visionary guidance and pledge our full support in building a world-class technician education system in the state.

Welcome, Sir! We really hope that the invaluable impact of your guidance will keep on nurturing most valuable human resource of our state: skilled diploma students.

Message from Director, MSBTE, Mumbai

Dear Readers,

At the outset, I extend my heartfelt greetings to everyone for a very joyful, peaceful, healthy, and prosperous New Year. The start of a New Year is the perfect moment to reflect on the successes of the previous year and to decide the direction in which we want to move ahead. During 2024, MSBTE has signed several MoUs with various organizations, important ones include National Institute of Electronics and Information Technology (NIELIT) to setup "Centers of Excellence (CoEs)" in Emerging Technologies at various Govt. Polytechnics, COEP's Bhau Institute of Innovation, Entrepreneurship and Leadership to create awareness & guide to establish "Incubation Centers" in select Polytechnics and NSDC International to establish a 'Centre for Skill-Based Certificate Courses'. The primary objective behind these MoUs is to take focused collaborative efforts for accelerated development of technical education in the state.

In addition to creating CoEs in the state-of-the-art technologies, MSBTE has established Multi-Function Computer Centres at all Government Polytechnics in Maharashtra. In collaboration with NABCONS (NABARD Consulting Services), for the first time, MSBTE has launched an online learning portal for 'Financial Literacy Module' under the "K Scheme" for its diploma students. A delegation of officials from MSBTE visited the Directorate of Technical Education in Guntur, Andhra Pradesh (AP), to explore the possibilities of mutual co-operation in Teaching-Learning Process. But since there are still higher goals to achieve, one shouldn't feel contended with what has been attained thus far. So, I urge all stakeholders involved in technical diploma education to collaborate resolutely and set shared goals and work together with determination to converge all their expertise along with optimum use of digital / emerging technologies for the faster development of the technical education to nurture our youth in the society.

"Education is the most powerful weapon which you can use to change the world", one crucial point raised by this influential statement is concerning with the need for innovation in teaching and learning that ought to occur both inside or outside of classrooms. Thus, the theme we have chosen for first issue of 2025 of our Newsletter is "Education in 21st Century: Innovations in teaching and learning" appears pertinent in current times.

With the changing educational landscape of today's world, we must also shift our approach towards classroom design and architecture to effectively support our students as they begin on this new journey. In keeping with the current theme, I would like to call upon various institutes to recognize the importance of creating **contemporary, adaptable, and specialized "Learning Spaces"** (both classrooms & other learning spaces like engineering Labs and workshops) in their campuses to establish a suitable setting for innovative teaching and learning.

In recent years, **a disruptive concept has emerged regarding learning spaces called 'Hyper-Classroom',** an innovative paradigm developed in contemporary educational setting. **'Hyper-Classroom'** is a novel **'Learning Space'** characterised by **3 concepts unified by the prefix 'hyper': space, media & reality**.

> - In 2024, MSBTE signed MoUs with prestigious organizaons like NIELIT, NSDC International and so on.
> - MSBTE launched an online learning portal for 'Financial Literacy Module' under the "K Scheme".
> - MSBTE Officials visited DTE in Guntur, AP, to get familiar with benchmark practices adopted by APSBTET.
> - Creating contemporary, adaptable, and specialized "Learning Spaces" for innovative teaching and learning.

- **Hyperspace**, refers to generously sized, open & flexible space that can be any time rearranged fairly rapidly to support team work (collaborative learning) or individual work.
- **Hypermedia,** classroom in which technology constitutes an environment in its own right and does not merely play a supporting role.
- **Hyperreality,** is the application of high-potential technology-based teaching tools like Augmented Reality, Virtual Reality, 3D or Immersive Reality in the class room.

Thus, hyper classrooms are characterized by their flexible and collaborative approach, integrating digital technologies to create dynamic learning environments.

Since Hyper classrooms are not only limited to a physical space, but have the ability to facilitate access to a wide variety of educational tools, such spaces foster collaborative learning, experiential learning, creative problem solving, multi-disciplinary learning and so on. In short, adaptability, flexibility and mobility in the design of the space, as well as the change in the role of the faculty from transmitter of knowledge to designer of technology enabled learning environments are key essentials highlighted by the various educational experts. In coming years, these technology-enhanced Hyper classrooms will provide students an immersive learning environment where facial recognition sensors will immediately update their attendance as they enter the classroom. Data analytics will allow the professors to gain more holistic insights into their students' learning and performance. In such classrooms, interactive canvasses will replace whiteboards, allowing lecture notes to be transferred straight from the canvasses to students' tablet.

The early steps towards such 'Learning Spaces' have already begun in our system. A few institutes have started establishing cutting-edge engineering laboratories which have distinct "zones" for every facet of a project: One area may have space for students to explore & share the early stages of ideas on whiteboards, interactive screens and simulation tools, this would then be complimented by a separate space for prototyping and designing, with computers equipped with CAD software and separate work surfaces to construct physical models of their idea.

To conclude, MSBTE firmly believes that innovations in teaching and learning is an ongoing process, and it is committed to exploring novel approaches to improve our students' educational experiences. If all stakeholders work together to establish novel teaching and learning environment in our diploma education system where one can try new things, make mistakes, and then try to get better, in coming years we can definitely lead the world in creative & evidence-based education. I hope that we will create a learning environment where all faculty members and students can benefit from one another, utilize their skills to the fullest and feel proud of our system.

I am confident that during 2025, MSBTE will succeed in its future endeavours with the assistance and coordinated efforts of all stakeholders. Once again, I wish you all the best of health, happiness and success in 2025.

Dr. Pramod Naik
Director, MSBTE, Mumbai

Dear Readers,

First and foremost, I would like to extend my heartfelt wishes for a prosperous New Year 2025 to all of you. Wishing you endless success and happiness in the coming year. May your aspirations reach new heights! As we all know this issue of our Newsletter refers to one of the most important and challenging themes of current times titled "Education in 21st Century: Innovation in teaching and learning". Various articles in this issue shed light on new trends that have emerged in recent years regarding the teaching and learning process, but I would like share with the readers an important aspect of the theme i.e., Adoption of 'Conscientious Approach' while integrating disruptive technologies in education. Let's have a quick look at the evolution & history of technology in the education sector as it relates to teaching and learning.

According to some studies, first educational films were screened in St. Petersburg in 1897, but other studies found that the newsreel in 1913 was the model for the first educational films. While the use of radio transmissions for educational purposes began in the 1920s, the use of overhead projector in 1930. Next came the television as an instructional medium, first documented in 1932 by the State University of IOWA in the United States followed by the headphones in 1950. Videotapes arrived in 1951, creating a new and exciting method of instruction. The photocopier (1959) and handheld calculator (1972) entered the classrooms next, allowing for mass production of material. The use of digital technology in education dates back to the 1970s, when computers were first introduced. The World Wide Web was born in 1990 when a British researcher created Hyper Text Markup Language, or HTML, and when the National Science Foundation lifted restrictions on commercial Internet use in 1993, the world exploded with newfound communication methods. In later years, the growth of digital tools & mobile devices have increased involvement and accessibility in education. Multimedia components were added to digital learning in the 2000s as technology developed further. Videos, animations, and interactive simulations enhanced the learning experience, catering to different learning styles. With the introduction of immersive technologies in the 2020s, digital learning has advanced to newer heights. Traditional classrooms have been converted into virtual landscapes by introduction of virtual reality (VR) and augmented reality (AR), which offer students engaging and interactive experiences with 3D objects thus gaining better understanding of concepts. Now, algorithms using artificial intelligence (AI) examine individual learning styles and modify content to suit each learner's particular requirements. This shift towards personalized learning ensures that education is tailored to the strengths and weaknesses of each student.

Let's now focus on comprehending the idea of "disruptive technology" in education and implementing a "Conscientious Approach" when incorporating it into the educational framework. Disruptive technology in education, a new and innovative approach to teaching and learning, departs from conventional educational methodologies intending to create more efficient means of delivering education. Personalized learning, automated student data management, effective analytics and reporting, profound progress evaluation, and efficient recording and sharing of instructional materials are just a few advantages that educators can attain by implementing contemporary disruptive technologies in the classroom. However, amidst this wave of transformation, there is a crucial requirement that must serve as the foundation for every strategic initiative: 'Conscientious Approach' which goes beyond simply recognizing technological advancements; it represents a comprehensive awareness of the consequences, risks, and potential benefits associated with the integration of disruptive technologies in educational environments. In other words, it defends against the pitfalls of technological determinism, in which the attraction of innovation overrides critical analysis of its wider ramifications. This approach forces educational leaders to take a self-reflective approach by making them think about "Why are we implementing it, and how will it enhance the educational experience?" Thus, a conscientious approach act as a key strategic requirement that comes before the use of disruptive technologies in educational settings. This strategy requires taking into consideration following intricacies of digital transformation: **Comprehending Current Educational Environment:** Comprehensive examination of the contextual elements influencing the current educational landscape and fuell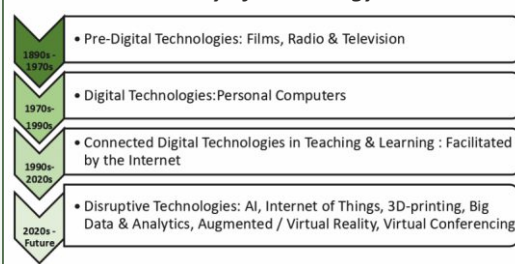ing the need for technological innovation. **Managing Pros & Cons of Disruptive Technology:** Examination of the possible opportunities & challenges associated with the implementation of disruptive technologies, from heightened learning outcomes to fears surrounding data privacy and digital inequality. **Ethical Issues in Educational Technology**: Scrutiny of the ethical dilemmas inherent in the integration of disruptive technologies in education and the necessity of ethical leadership in guiding responsible technological innovation. **Addressing Digital Divide:** Exploration of the critical role of conscientious approach in tackling inequalities in technology access & promoting digital inclusion within educational environments. **Empowering Instructors through Training & Support:** Examination of how a conscientious approach can equip educators with the essential skills and resources to utilize technology effectively within the classroom setting. **Fostering a Culture of Adaptability:** Study of strategies aimed at promoting a culture of resilience and flexibility in response to technological advancements, emphasizing the significance of professional development & stakeholder engagement. **Enhancing Community Involvement & Cooperation:** Lastly, contemplation on the significance of community engagement and cooperation in facilitating substantial educational transformation, and the role of conscientious approach in fostering inclusive decision-making processes. Thus, through conscientious approach and collaborative action, one can navigate the complexities of technological disruption with clarity, compassion, and purpose, ensuring that every learner has the opportunity to thrive in the digital age.

Hope this edition of our Newsletter would offer comprehensive insights into the latest innovations in Teaching and Learning. Wishing you all a productive time ahead!

Shri. Umesh Nagdeve
Secretary, MSBTE, Mumbai

Evolution & History of Technology in Education

1890s-1970s	• Pre-Digital Technologies: Films, Radio & Television
1970s-1990s	• Digital Technologies: Personal Computers
1990s-2020s	• Connected Digital Technologies in Teaching & Learning : Facilitated by the Internet
2020s-Future	• Disruptive Technologies: AI, Internet of Things, 3D-printing, Big Data & Analytics, Augmented / Virtual Reality, Virtual Conferencing

MSBTE Delegation Visits Andhra Pradesh State Board of Technical Education & Training

MSBTE NEWSLETTER

MSBTE team led by Dr. Pramod Naik, Director, MSBTE at DTE, Andhra Pradesh

A MSBTE delegation led by Dr. Pramod Naik, Hon. Director, Maharashtra State Board of Technical Education (MSBTE), visited the Directorate of Technical Education (DTE), Andhra Pradesh and State Board of Technical Education and Training (APSBTET), Mangalagiri, Guntur District, Andhra Pradesh on 25th November 2024. The other four members of the delegation comprised of Dr. Chandrakant Kapse, Deputy Secretary (T), Smt. Mrunal Kokate, Deputy Secretary (T), Smt. Urmila Hire, System Analyst and Shri. Abhinay Sahu, System Analyst. The main idea behind this visit was to get familiar with the best benchmark practices which are adopted by the SBTET, for better Governance of Diploma Education in the State of Andhra Pradesh. Besides this, it also aimed at discussing various areas of mutual interest and possible collaboration in the field of polytechnic education.

Felicitation of Dr. Pramod Naik, Director, MSBTE by Shri. G. Ganesh Kumar, IAS, Director & Chairman, DTE & SBTET, AP

On the day of the visit, a meeting was held under the Chairmanship of Shri. G. Ganesh Kumar, IAS, Hon. Director & Chairman of DTE & SBTET, Andhra Pradesh, respectively at 10 am in the conference room of DTE. The other officials present during the meeting comprised of Jt. Director & Dy. Director from DTE, Andhra Pradesh and Secretary, Jt. Secretary, Dy. Secretary of various sections, Asst. Secretary and System Analyst of SBTET, Andhra Pradesh.

Mr. G. Ganesh Kumar informed the delegation that DTE in Andhra Pradesh makes the policies to run the diploma education as per the policies of the State Government and Central Government and the latest trends in the various fields of technology, while the implementation part of those policies and initiatives controlled by SBTET in their State. In his presentation, Mr. G. Ganesh Kumar highlighted the State's initiatives such as Modern Labs, Industry Linkage Programs, Skill Hour, Tech Fest, Alumni Meet, Virtual Classrooms, the Credit System, and new courses introduced across polytechnics in the state. Regarding Industry Connect, he mentioned that both DTE and SBTET in his state are collaborating

rigorously with industries for the development of need based curriculum which in turn resulting in better job prospects for diploma pass outs. He further informed about a new concept 'Cluster Approach' initiated by him after resuming the office. This approach was later briefly explained by the Dy. Director, Training and Placement Cell, DTE, AP. He then invited Secretary, SBTET, AP, to elaborate on functioning of SBTET, who briefed on the Curriculum, Academic Audit, Planning, Online Distribution of Question Papers, Campus Selections and other activities of the SBTET.

Visit of MSBTE team to M.B.T.S. Govt. Polytechnic, Guntur, AP

During his interactions, Dr. Naik appreciated the forceful focus of Andhra Pradesh's SBTET on Skill Development initiatives such as the Skill Census and introduction of Courses such as Artificial Intelligence, Machine Learning, Electric Vehicle Technology, and the Internet of Things. He pointed that Andhra Pradesh's SBTET emphasis on emerging technologies reflects its forward-thinking vision.

The delegation later on proceeded to M.B.T.S. Government Polytechnic in Guntur where they were welcomed by Mr. Sri T. Sekhar, Principal, Government Polytechnic, Guntur and Senior Faculty. The polytechnic has five disciplines in the first shift and three disciplines in the second shift with a total intake of 480students. They visited workshops, labs & other parts of the campus. Overall, the visit was quite successful as both MSBTE and SBTET, AP, exchanged knowledge about each other's Diploma Education System. To have further interactions with each other, AP SBTET officials expressed their desire to visit MSBTE, Mumbai.

Academic Committee Meeting of MSBTE

The 49th Academic Committee Meeting of Maharashtra State Board Technical Education was held under the Chairmanship of Dr. Pramod Naik, Director, MSBTE on 30th January 2025.

Education in 21st Century: Innovations in Teaching and Learning

"21st Century skills are put forth as critical for the Digital and Evolving Economy"

Many educators, finding rigid timetables to be too inflexible, have solved this by getting rid of lessons altogether. Institutes such as the Kunskapsskolan schools in Sweden and the Lumiar schools in Brazil have instead organized individual learning plans or group projects that vary in length. In these instances, the allocation of space, time and resources is not fixed. Instead, it is up to the students to decide on how they will make best use of them in order to meet their learning objectives. Teachers support students throughout this process and monitor their progress closely.

Using technologies in the field of higher education, in which students are already well versed, is a powerful way to support independent, enquiry-based collaborative learning, increase standards of written work and allow for instant and reflective forms of assessment. It also has huge potential for unlocking student engagement. By integrating technology into learning experiences, we can better integrate the institute into students' lives, which means students are more engaged in their learning both inside and outside of institute.

When well-designed projects are developed in this way, with input and feedback from a range of sources, they enable students to gain the very skills – such as commitment, problem-solving and adaptability – that employers are demanding from graduates. They also cross the borders between subjects, between 'academic' and 'vocational' learning, and between the worlds of adults and students. This is important, because when you are an adult, the world never divides itself up into neat little categories – that only ever happens when you are in college.

Of course, creating a more fluid relationship between 'teachers' and 'students' in the kinds of ways outlined here is not easy, and needs to be built on a strong foundation of mutual respect, understanding and trust. Yet, where institutes have been daring enough to share responsibilities with students in an authentic and meaningful way, results have been extremely positive. Outcomes show improvements in academic achievement, but also wider positive benefits such as an increase in the quality, frequency and flexibility of learning relationships – all of which lead to deeper engagement and the creation of educational communities that work together to make teaching as good as it can be.

With the help of technology and radical reimagining of time and space, then, lessons no longer have to adhere to the 'one size fits all' approach characteristic of the traditional system. Students stand to gain a lot from more personalized lessons and greater control over their own learning, but they are not the only ones getting benefitted. The implications for teachers are also exciting. They become freer to take on different roles, including mentor, coach and designer of projects that highlight the real-world relevance of subject material. This creates the potential for them to have a deeper, more fulfilling engagement with students, and a more creative part to play in the design and delivery of curricula.

In a traditional classroom, students sit in rows at individual desks, facing the teacher. There is a very good reason for this: they are designed so that teachers can efficiently transmit information to groups of students. This made sense when teachers were students' most accessible information sources. But in an age in which wireless internet means we are literally surrounded by information; we no longer need students in rows facing the teacher. The pursuit of 21st century skills – collaborative problem-solving, IT, information and economic literacy – require 21st century teaching methods. The role of teachers can no longer be to impart knowledge but to guide, discuss and, of course, measure the progress of students so that they know when more support is needed. Today, innovative educational institutions are designing classrooms for the pursuit of knowledge, rather than its conveyance, and even doing away with them altogether.

Satish Maniar
Founder, TECHNOCAD, Nashik

Digital Learning: Opportunities & Challenges

India boasts a diverse and vibrant cultural heritage. As Swami Vivekananda aptly stated, "Education is not the amount of information that we put into your brain and runs riot there, undigested, all your life. We must have life-building, man-making, and character-making assimilation of ideas." His ideology emphasizes the role of education in transforming individuals and societies. The 19th century witnessed the emergence of great educationists who introduced distinct ideas and philosophies to redefine the education system. Moving into the 20th century, their focus shifted towards fostering compliance and conformity, skills deemed crucial for thriving in professional environments and maintaining long-term job stability. However, in contrast, 21st-century education emphasizes active learning and acquiring life skills as integral parts of classroom experiences. Learning skills, in particular, prioritize critical thinking, creativity, collaboration, and communication—key competencies for navigating modern, dynamic workspaces and adapting to the evolving demands of the global landscape.

The primary aim of teaching is to enable learning that encompasses changes in students' knowledge, beliefs, behaviors, attitudes, and skills. Significant learning occurs when students find the subject matter meaningful and connected to their own goals and aspirations. This type of learning is most effective when it is hands-on, allowing learners to engage directly with the content. Active participation and a sense of responsibility in the learning process further enhance understanding, as students take ownership of their educational journey and apply knowledge in practical, purposeful ways. Educators must recognize the diversity of students and incorporate varied teaching methods catered to their different learning needs. Setting hard but realistic goals encourages students to put more efforts and dedication into their studies.

The 21st Century Learning Framework
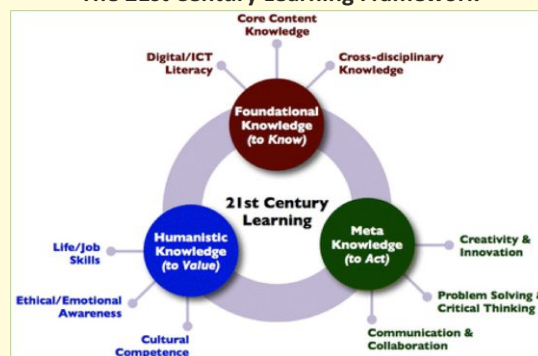
(Courtesy: Fig uploaded by Rohit Metha)

Increasing the frequency of student-teacher and student-student

Changing Educational Landscape in 21st Century: Role of Blended Learning

Rapid technological development, globalisation, and the constantly changing needs of contemporary society have all defined the twenty-first century. To keep up with these developments, education had to innovate and adapt. This article examines the major developments influencing education in the 21st century. Blended learning is particularly highlighted as a game-changing strategy.

Changing Educational Environment: In the twenty-first century, education is no longer limited to the conventional classroom setting. Traditional teaching approaches have been upended by the emergence of digital technology, which has given teachers new tools to improve accessibility, engagement, and personalisation. Changes in society, like a greater focus on critical thinking, global competences, and teamwork, have also made it necessary to reconsider what and how students learn. Global issues including health crises, socioeconomic disparities, and climate change necessitate presence of an educational system that gives students the tools they need to solve these problems.

New Phase of Teaching and Learning

- **Integration of Technology:** Technology integration is one of the biggest developments in education. The learning process is now more participatory & student-cantered thanks to digital tools & platforms. For instance, Project-based activities incorporating Technology, Game-based Learning, Instructional tools like Interactive Whiteboards and so on.

- **Augmented and Virtual Reality (AR/VR):** Students can investigate historical events, travel to far-off locations, or carry out scientific experiments in a virtual setting with the help of apps like Google Expeditions and Oculus Rift.

- **Artificial Intelligence (AI):** Adaptive learning platforms adjust content based on the learner's pace and performance which would be very effective in contemporary learning.

Blended Learning - Bridging the Best of Both Worlds: An inventive method that blends traditional in-person instruction with online learning is called blended learning. This hybrid approach combines the best features of both approaches to produce an adaptable, interesting, and successful learning environment. Key Benefits of Blended Learning include **Flexibility:** Students can review difficult ideas and obtain information at their own speed. **Increased Engagement**: Multimedia resources and interactive web technologies increase student interest in learning. **Data-Driven Insights**: Teachers can quickly address learning gaps thanks to online tools that offer comprehensive information on student performance. **Skill Development**: The mixed strategy promotes time management, self-control, and digital literacy. There are several models of blended learning, important ones include:

- **Flipped Classroom:** Students study instructional materials online before class, freeing up classroom time for interactive activities.

- **Station Rotation:** Students rotate between online and in-person learning stations within a single class period.

- **Enriched Virtual Model:** Online coursework is supplemented with occasional in-person sessions.

Conclusion: Innovation in teaching and learning is driving a significant revolution in education in the twenty-first century. Education could become more successful, inclusive, and engaging with the use of technology, collaborative methods, and blended learning models. Innovative approaches like community-based learning programs and solar-powered digital classrooms will be helpful in closing the educational gap in underdeveloped nations. To guarantee that everyone has fair access to high-quality education, cooperation between the public and private sectors as well as non-profit groups will also be crucial. So, as we all traverse this fascinating but complicated terrain of technology integration, all the stakeholders of our education system including legislators, faculties, and students, must collaborate to create an educational landscape that not only satisfies current needs but also equips our youth for future opportunities and challenges.

Dr. Sandhya Shetty
Lecturer, Comp. Engg., Thakur Polytechnic, Mumbai

Digital Technology-driven Education in 21st Century

21st century has brought digital revolution with it. It has given birth to many disruptive technologies like Artificial Intelligence and Augmented Reality / Virtual Reality. These technologies have changed many aspects of our lives. They have immense potential in education field too. The traditional method of chalk and board seems to be outdated now. Today's generation is tech savvy and digitally native. For making students employable and able to solve real world problems, skills like creativity, critical thinking, innovative mindset, digital literacy, entrepreneurship and team work needs to be inculcated in them. To develop these skills our education system needs to be upgraded.

Education in 21st century should focus on including emerging technologies in teaching learning process. Artificial intelligence-based tools can be used to develop personalized learning experience for students. AR/VR has the power to present most difficult concept visually and with realistic experience. Learning Management Systems like Moodle and Google classroom can be used to manage assignments, tests, study material and assessments. This reduces both wastage of time and paper. Introduction of games like crosswords, quiz can make classroom lively. Websites like hot potatoes and Google quiz and can be used for it. For developing analytical skills among students, classroom time should be more utilized for problem solving rather than lecturing. Flipped classroom model provides this feature where lectures can be provided to students in digital form and actual classroom time can be utilized for problem solving. IIT Bombay has developed such flipped classroom model called as Bodhitree. Students today are more comfortable with digital contents and hence blended learning can be introduced which mixes offline and online learning appropriately. Technology introduction in teaching learning process helps students to learn at their own pace, provides access to digital contents wherever and whenever they want. Not require to take physical notes. Audio visual content helps retain concepts for longer period of time. Real time assessments with immediate feedback are possible.

For implementing these changes every educational institute must be equipped with digital infrastructure like computers, laptops, interactive panels, Smart TVs and internet. Formal training should be provided to teachers to embed emerging technologies in teaching learning process and advanced pedagogy. Teachers should develop their skills to create quality digital contents. When every student of all sections of society should have access to computers, laptops, tablets and internet then only it will be successful. Technology has given us opportunity to bring revolution in education field, it is high time we grab it.

Amol S. Gaikwad
Lecturer, Comp. Deptt. Government Polytechnic, Gadchiroli

Transformative Pedagogy:
Harnessing the Power of Artificial Intelligence in Education

Artificial Intelligence (AI) has the potential to address some of the biggest challenges in education today, innovate teaching and learning practices, and accelerate progress towards Sustainable Development Goal 4 (SDG 4). Artificial intelligence (AI) can support education by automating administrative tasks, freeing teachers to focus more on teaching and personalized interactions with students, enhancing rather than replacing human-led teaching.

Educators, Policy makers, AI experts, and thought leaders are currently keen on exploring and shaping the future of education through artificial intelligence. For harnessing the power of Artificial Intelligence in Education, following points should be taken into consideration:

- Addressing the requirement of infrastructure and resources needed for AI integration in education, including digital tools and platforms
- Role of AI in supporting students personalized learning journey and holistic development.
- Ensuring ethics and integrity in AI-driven educational practices, preventing bias and ensuring transparency
- Intelligent tutoring systems and AII-powered learning analytics for improving student success.
- From automation to augmentation - AI's role in enhancing teachers' capacity and professional development.
- Equitable, accessible and quality education to DIVYANG using AI
- Strategies for scaling AI solutions in diverse educational settings, including rural and resource-constrained environments.
- Creating a repository of AI-driven education resources and best practices for ongoing reference and use by educators and policymakers.

There is a need to navigate the transformative potential of AI, ensuring it serve as a tool to enhance educational outcomes and foster a more personalized and effective learning environment. AI could play a transformative role in addressing educational challenges, such as teacher shortages and varying educational standards across states, ultimately contributing to a more inclusive and effective educational system. The National Education Policy (NEP) 2020 highlights the importance of incorporating AI in the curriculum to prepare students for the future. The NEP emphasizes building AI literacy and equipping students with the skills needed for an AI-driven world.

S. S. Dhoot
Lecturer, IT Deptt.,K. K. Wagh Polytechnic, Nashik

engineering problems. To address these challenges, educators need to adopt innovative teaching methods and tools that actively involve students. The focus should be on creating a learning environment where students can apply their knowledge to solve real-world engineering problems. A key challenge in experiential learning is the difficulty in maintaining consistent student engagement. This can be comprehended through low participation, passive involvement, and limited reflection on practical activities. These issues can have serious consequences, as they can negatively affect students' academic performance, personal growth, and readiness for professional careers. To overcome this, educators must shift their teaching methods towards active and collaborative learning.

Active learning is a valuable approach to making the teaching process more effective. Activities such as micro-projects, team-based tasks, and problem-solving exercises help students work collaboratively, take on leadership roles, and build critical skills like communication, project management, and decision-making. These methods also encourage students to engage with real-world engineering problems, leading to a better understanding and practical skills.

In addition to these activities, educators can use online teaching platforms like Moodle, Google Classroom, and Edmodo. These platforms provide flexibility, allowing students to access materials and resources anytime. They also act as helpful revision tools for students to reinforce their learning. Virtual classrooms on Zoom, Microsoft Teams, or Google Meet enable interactive sessions, further improving student engagement.

Teachers must stay updated on new technologies in today's education system and incorporate them into their teaching methods. Combining active learning with online tools creates an engaging and interactive learning experience. This approach enhances experiential learning and ensures students benefit fully from their education. Educators should also develop teaching methods tailored to the specific needs of their students. By doing this, they can address different learning styles, align with industry expectations, and support the overall growth of their students. Ultimately, the aim is to provide a learning experience that is meaningful, enjoyable, and effective in preparing students for their future careers.

Jayant Pharne
Lecturer, Mech. Engg., RIT, Islampur, Sangli

Innovations in Teaching and Learning : Changing Role of Educators

In recent years, engineering education has faced significant challenges in keeping up with the rapidly changing demands of the global market. With the constant advancement of technology, students need to develop skills and knowledge that align with industry requirements. As a result, the responsibilities of educators have increased, requiring them to bridge the gap between theory & practice by encouraging experiential learning. Traditional teaching methods are no longer sufficient due to the diverse learning styles of students and the complexity of modern

Few Innovative Teaching and Learning Strategies

- **Genius Hour:** "Genius Hour" is a learning approach where students dedicate a set time in class to explore topics of their own interest or passion, developing crucial questions, researching their topics, and conducting self-directed projects, which can be highly beneficial in engineering education by fostering creativity, problem-solving skills, and intrinsic motivation to learn about specific engineering areas that might not be covered in the standard curriculum.
- **Real-World Simulations:** Real-world simulations are instructional scenarios that help students learn by applying their practical knowledge to real-world situations. Present learners with specific situations and challenges. Learners navigate through scenarios, making decisions and solving problems. Used in developing decision-making skills and crisis management.

The Ever-evolving Education Environment: The 21st century requires that basic understanding of education to be changed drastically. The old approach of rote learning and passive instruction is no longer sufficient to equip students to face the complexities of a modern world.

Innovation in Teaching Methodologies: Thus, in this fast-changing educational environment, novel and innovative teaching methods are being progressively adopted by educators to succeed. Interactive learning practices, such as collaborative projects, simulations, and real-world problem-solving, are becoming increasingly prevalent.

Role of Technology: Technology is a key driver in changing the present-day learning experience. Digital tools and resources provide access to a wealth of knowledge and information, enabling personalized learning pathways and nurturing creativity and critical thinking among the learners.

Blended Learning Models: Blended learning models, gaining immense popularity, combine face-to-face instruction and online learning into one entity with flexibility to provide for a broad range of styles of imparting education. With this, learners are allowed control and manage the learning process for themselves.

Producing Lifelong Learners: The ultimate goal of 21st century education is to create lifelong learners. By developing essential skills such as critical thinking, problem-solving, creativity, and collaboration, that educators prepare their students for the constant change in demands of ever-evolving corporate world.

Conclusion: In short, education in the 21st century demands for something more dynamic and innovative ways of teaching and learning. Using technology, engaging methodologies, and individualized learning are ways through which teachers can help students prepare to meet the changing demands of their world. There is also a need for constant adjustment and an assurance of equal access to learning environments for all.

Parth Rajesh Veera
2nd Year, Automation & Robotics, VES Polytechnic, Mumbai

Microlearning: Bite-Sized Education for Maximum Impact

In the present day digital age, where students' attention spans are at their lowest because of the impact of social media and brief content, conventional teaching approaches frequently find it hard to engross the students. Microlearning is solution to this problem, as it delivers content in small, focussed shots to minimize the cognitive effort needed to absorb information. In this method, complex topics are broken down into small engaging sessions. Microlearning is founded on the concept of providing brief and focussed lessons that can be delivered within a few minutes. This method utilizes various set-ups like microlearning videos, flashcards, quizzes, and even mobile apps. A video (of 2-5 min.) is just as it sounds: a short video that delivers an on-demand microlearning lesson. Mobile flashcards (another example of microlearning) are just like the normal flashcards used for learning, but in a digital format on phone or tablet. A student preparing for an exam can use flashcards to quickly review key concepts or watch a short tutorial on a difficult topic instead of sitting through a lengthy lecture. Similary, platforms like Quizlet, Quizziz are some other examples of how microlearning has the potential to transform learning. Few examples of such platforms are Centrical, EdApp and Kahoot.

Microlearning can be a game-changer in educational institutes where most students are hooked to their smartphones. By matching educational material with the formats that students are already familiar with, teachers can shift the learning approaches of students. Microlearning offers several benefits, including - **Flexibility:** Microlearning allows students to learn anytime, anywhere. Students will be encouraged to control their social media consumption for these sessions during their free time. **Improved Memory:** Research has shown that data or information shared in small parts is simpler to recall. Microlearning emphasizes a single concept at a time, aiding in the reinforcement of comprehension and memory. **Engagement:** Short lessons maintain students' focus, minimizing boredom and distractions. Adding interactive elements like quizzes and gamification further enhance engagement.

Conclusion: Microlearning is playing an important role in the education framework of the 21st century. By addressing the needs of the current learner, it connects traditional education with the digital practices of students. In future as attention spans decrease further and distractions increase, implementing microlearning can help educators in providing absorbing lessons, thus making sure that learning stays relevant, engrossing and efficient.

Aryan Aich
3rd Year, E&T Engg., JSPM's Jaywant Rao Sawant Polytechnic, Pune

Virtual Reality: A Transformation for Immersive Learning

In the rapidly evolving sector of education, Virtual Reality (VR) stands out as one of the most innovative technologies of the twenty-first century. VR, which was earlier regarded to be a tool for gaming and pleasure, is now revolutionizing how we engage with instructional information and learn. The interactive and immersive VR activities can have a important impact towards achieving the expected learning outcomes. Basically, VR allows students to enter a simulated environment where they may engage in interactive, hands-on interactions with concepts, ideas, and scenarios which enhances their technical skills and confidence. In fact, VR is giving students the opportunity to explore intricate, real-world situations in many disciplines like medicine, engineering, architecture, and even arts which otherwise become too costly, difficult, or unattainable.

Virtual reality is being employed in the medical field to educate doctors in diagnostic methods, carry out surgical simulations, and execute virtual dissections. In the realm of engineering, there are numerous abstract concepts and principles that can prove difficult for students to understand. Engg. instructors can benefit from the visualization capabilities of VR to improve students' grasp of these abstract ideas. In Electronics Engg., VR offers a platform for assembling and testing circuits entirely in a virtual space. In Civil Engg., students can evaluate virtual structures under various stress scenarios, including earthquakes or stroms. In Mechanical Engg., to investigate the impacts of changes on a design, process, or system without having to make changes to the actual components being simulated.

Thus, VIRTUAL REALITY plays a very crucial role in the 21st century Educational Learning. As various institutions and educators adopt these practices, the shift towards teaching becoming collaborative and learning becomes increasingly easier.

Aman Nerkar
2nd Year, Civil Engineering, GGSP Polytechnic, Nashik

AI की छांव में, बढ़ता ज्ञान का पेड़,
छात्रों की मेहनत, अब है और भी तेज़।
हर सवाल का हल, बस एक क्लिक में मिले,
पढ़ाई का सफर, अब खुशियों से भरे।

Education in the present century is experiencing a tremendous transformation as a result of numerous technological breakthroughs, especially the rise of Artificial Intelligence (AI). AI in education helps educators identify gaps in student knowledge and provide targeted support through customized lessons to improve learning outcomes. From the student's perspective, AI is changing how they interact with their teachers and learn. It opens up stimulating new possibilities for custom-made education, boosting the effectiveness and desirability of learning.

AI based Teaching - Learning Platforms and Student Support:

- **IBM Watson Chatbots:** IBM Watson is an advanced AI chatbot commonly utilized in educational settings to improve learning outcomes. It provides personalized tutoring, assisting learners in grasping difficult subjects through immediate feedback and detailed explanations. Watson helps teachers by evaluating student performance and providing insights to enhance instructional strategies. These Chatbots answer questions related to course content enhancing student engagement and satisfaction.

- **Duolingo:** This language learning platform utilizes AI to create personalized lessons for users. Duolingo uses artificial intelligence to analyze users' learning behaviors and activities, subsequently creating a customized learning path based on this data. The application employs advanced AI methods to offer immediate language practice, feedback, and assistance.

- **Smart Sparrow:** This adaptive learning platform uses AI. Adaptive learning is an instructional approach that leverages data to modify and customize educational experiences according to the unique requirements of each learner. These systems are capable of monitoring various metrics, including student advancement, engagement levels, and performance outcomes, utilizing this information to deliver tailored learning experiences.

- **Synthesia:** AI tools like Synthesia allow educators to produce high-quality videos with AI avatars quickly and cost-effectively. These videos can be customized for specific learning objectives, localized in multiple languages, and updated with minimal effort, making them ideal for dynamic educational environments.

- **Blackboard Learn:** Designed in collaboration with educators, Blackboard is the Learning Management System (LMS) that saves instructors time, empowers student choice, and promotes continuous improvement for all.

- **Similar platforms for learning using AI:** TalentLMS, eFront, Learnt.AI, Docebe, LearnUpon, Descript and so on.

Abhaya Derle
3rd Year, IT, K. K. Wagh Polytechnic, Nashik

Theme For The Next Issue:
Social Media Impact on Student's Academic Performance and Well-being

Digital Learning: Opportunities & Challenges

interactions amplifies the perceived support from the learning environment, fostering greater student motivation. Moreover, providing chances for collaborative learning allows students to analyze their own assumptions and thought processes by discussing ideas in a group setting, which improves their metacognitive abilities. Owing to this, we must do take a view of available infrastructure, skilled manpower, quality of input, time management, retention, financial conflict which have a bearing on the challenges faced by students of the 21st century

Challenges faced by Educators in 21st Century

In the fast-changing 21st century, education has undergone major shifts, presenting unique challenges for educators worldwide. The advent of technology, shifting student demographics, and evolving learning needs have reshaped the educational landscape.

One of the major challenges educators face today is effectively integrating technology to improve learning outcomes. Digital tools and online resources provide vast opportunities, but their successful implementation in classrooms can be discouraging. Educators need to develop proficiency in using these tools to engage students while promoting ethical and responsible use. Moreover, technology can also bring distractions and contribute to information overload, which affects students' concentration and retention. Striking a balance between utilizing technology and nurturing critical thinking skills is a critical task for education system leaders. Secondly, even when technology is accessible, instructors' capacity to successfully use these tools remains significantly limited. The absence of professional development opportunities for instructors in the application of current teaching approaches and technology is a significant hindrance. Thirdly, socio-economic inequalities significantly impact the educational environment in developing countries. Children from disadvantaged backgrounds frequently encounter obstacles to obtaining quality education stemming from issues such as poverty, gender bias, and distance from educational facilities. Fourthly, Modern classrooms are increasingly diverse, with students representing varied cultural, linguistic, and socio-economic backgrounds. This diversity offers opportunities for enriched learning experiences but also poses challenges for educators. Fifthly, today's educators need to move beyond a one-size-fits-all approach and embrace differentiated instruction, project-based learning, and real-world applications to engage students effectively. However, implementing these innovative strategies is challenging, as it necessitates continuous professional development and adaptability in teaching practices. Last but not the least, while the digital age has made information more accessible, it has also brought challenges such as information overload and the spread of fake news. Educators play a vital role by teaching them how to critically evaluate sources, distinguish facts from misinformation, and thoughtfully analyze the content they encounter.

Summing up, teaching in the 21st century is quite demanding but it also provides unique opportunities to transform education. By leveraging technology, fostering inclusivity, addressing changing learning needs, and equipping students with critical thinking skills, educators can effectively prepare learners for the complexities of the modern world.

Makrand Tikar
Technical Lead, Tata Technologies, Pune

MSBTE NEWSLETTER

Chh. Sambhajinagar & Nagpur Region

Government Polytechnic, Ahmednagar (24th January 2025) (Mechanical Engineering Group)

First Prize: Vaibhav Sharma and Nikhil Rathod from Government Polytechnic, Chh. Sambhajinagar

Second Prize: Jayesh More and Yash Bagul from SNJB's Shri Hiralal Hastimal (Jain Brothers) Polytechnic, Chandwad, Jalgaon

Third Prize: Suyash Kulkarni and Suraj Shinde from Government Polytechnic, Nanded

Tulsiramji Gaikwad-Patil College of Engineering and Technology, Nagpur (30th January 2025) (Civil Engineering Group)

First Prize: Vaibhav Dhepgunde and Ashish Dhone from Gramin Polytechnic, Nanded

Second Prize: Krunal Sawarkar and Harshad Mehata from Tulsiramji Gaikwad-Patil COET, Nagpur

Third Prize: Hement Dandekar and Shreyash Agrawal from G. H. Raisoni College of Engineering & Management, Nagpur

Yashwantrao Bhonsale Institute of Technology, Sawantwadi (24th January, 2025) (Mechanical Engineering Group)

First Prize: Pooja S Kokare and Suyog V Desai from Yashwantrao Bhonsale Institute of Technology, Sawantwadi

Second Prize: Satish Kumar Yadav and Ritesh Kumar from SIT Polytechnic, Yadrav, Ichalkaranji

Third Prize: Shubham P Desai and Neeteesh S Rai Kumar from SGM Polytechnic, Mahagaon

Sanjay Ghodawat Institute, Kolhapur (29th January 2025) (Electronics & Telecommunication Engineering Group)

First Prize: Aditya Patil and Parth Sawant from Sanjay Ghodawat Institute, Kolhapur

Second Prize: Om Mahajan and Pranjal Kumbhar from Dr. D.Y. Patil Pratishthan's Y. B. Patil Polytechnic, Akurdi, Pune

Third Prize: Sakshi Gadge and Shravani Kulkarni from Shri Vithal Education & Research Institute's COET (Poly), Pandhar

Mumbai and Pune Region

BIM & IoT: Transforming the Construction Industry for the Future

Department of Civil Engineering of Suryodaya COET, Nagpur hosted a MSBTE sponsored FDTP from 21st to 25th Oct. 2024, on the Topic "BIM & IoT: Transforming the Construction Industry for the Future". The event focussed on the revolutionary role of Building Information Modelling (BIM) and the Internet of Things (IoT) in reshaping the construction sector. Eminent speakers from academia and industry shared their expertise, discussing how integrating BIM and IoT fosters productivity, sustainability, and innovation. The Program is Inaugurated by Dr. Manoj Daigavane, Joint Director DTE, RO, Nagpur.

Artificial Intelligence – Microsoft Azure AI- 900

Solapur Education Society's Polytechnic, Solapur conducted MSBTE sponsored FDTP titled "Artificial Intelligence – Microsoft Azure AI- 900" from 30th Dec. 2024 to 3rd Jan. 2025. The main objective was to provide understanding of fundamental AI concepts, Principles, and Methodologies covered in the AI-900 Certification and to equip the participants with practical skills needed to utilize Azure AI services and tools, enabling them to implement AI solutions effectively. During practical sessions, each participant's account is created on Microsoft learn portal which gives learning support for AI-900 certification.

Geospatial Technology Applications in Civil Engineering

The Dept. of Civil Engg. at SNJB's Shri Hiralal Hastimal Jain Brothers Polytechnic, Chandwad, successfully organized MSBTE sponsored FDTP & Hands-on Training from 21st to 25th October, 2024 on the theme "Geospatial Technology Applications in Civil Engineering". Participants were provided hands-on training in QGIS software, learning advanced skills such as GIS mapping, spatial analysis, and integration of geospatial tools for civil engineering projects. The Valedictory Ceremony was graced by Dr. G. V. Garje, Jt. Director DTE, Nashik, & Shri. D. R. Dandgavhal, Dy Secretary, RBTE, Chh. Sambhaji Nagar.

Environment Management and Sustainability (EMS -2025)

MSBTE sponsored FDTP programme on "Environment Management and Sustainability (EMS -2025)" was organized by the Chemical Engineering Department of K K Wagh Polytechnic, Nashik between 6th to 10th January, 2025 on the backdrop of a policy decision by MSBTE to introduce a common course on Environmental Management and Sustainability for all programmes. Field visits of participants to ABB (I) Ltd., Nashik and Devrai project (manmade forest developed to protect biodiversity) were organized to observe the implementation of Environment protection and sustainability practices on ground.

Software-based Planning, Designing and Modelling in Construction

MSBTE sponsored FDTP on the topic 'Software based Planning, Designing and Modelling in Construction' was organized by Civil Engg. Dept. of Bharati Vidyapeeth Institute of Technology, Navi Mumbai from 21st to 25th October 2024. Inaugural function was held on 21st October 2024 with Dr. H.M. Pardeshi, Dy. Secretary, RBTE, Mumbai as the Chief Guest. Experts conducted lectures on various topic related to Software based Planning, Designing and Modelling in Construction. In the Valedictory function Dr. Mohan Dagaonkar was the Chief Guest. 31 faculties from various Institutes of the state participated in the FDTP.

IoT Applications and AI ML

E&Tc Deptt. of Shri Siddheshwar Women's Polytechnic, Solapur conducted MSBTE sponsored FDTP "IoT Application and AI ML" from 6th- 10th Jan. 2025. The main objectives was to give exposure about the emerging trends in Internet of Things, AI & Machine Learning Techniques, to improve faculty expertise by exploring innovative teaching methods and tools to effectively deliver AI ML concepts to students and to integrate hardware and software for IoT Applications. An Industrial Visit was arranged on IoT based Smart Water Supply Monitor and Control Unit at Solapur Mahanagar Palika, Solapur.

Remarkable Journey of Government Polytechnic, Pen

Government Polytechnic, Pen, was established in 1990-91 by the Govt. of Maharashtra under the Directorate of Technical Education and affiliated to MSBTE. Since its inception in Alibag, offering just two programs in Civil Engineering and Mechanical Engineering , the institute has grown tremendously over the decades. The subsequent addition of new programs in Instrumentation & Control Engg. and Chemical Engg., and shifting to its present state-of-the-art campus in Ramwadi, Pen, in 1998 can be marked as significant milestones in its journey. The addition of the Computer Technology program in 2007 has further enhanced the academic portfolio of the institute.

Over the past 6-7 years, the institute has achieved a remarkable feat of having 100% admissions, showcasing its reputation and demand among aspiring students. The institute's dedication to student success is also reflected in its robust campus placement record, with renowned companies such as Toyo Engineering, Technip Energies Ltd, Reliance Industries, Aditya Birla Group of Industries, Voltas, JSW steel, Gharda Chemicals, Godrej Industries, etc. offering opportunities to its graduates. Because of the UN Women's Valpan FLIGHT program, mindset of its female students got changed towards aspiring career. The institute ensures full support to female students through various initiatives mandated by the Govt. of Maharashtra such as conducting various activities through ICC, providing Karate Training for self-defence & Counselling facility (also extended to male students).

In 2024, GP Pen, attained a landmark milestone with establishment of Design, Simulation & Additive Manufacturing Tech Lab in the Mechanical Engineering Department under CSR donations from Siemens Energy, Pune, thus providing advanced tools for hands-on learning in design and manufacturing. This lab was inaugurated at the hands of Hon. Dr. Vinod Mohitkar, Director, Directorate of Technical Education (DTE) and Mr. Girish Garg, Head-ESC, Siemens Energy, in the presence of Dr. Mahendra Chitlange, Principal, Government Polytechnic, Pen on 11th Dec. 2024. Last year, MSBTE has also established a state-of-the-art Computer Centre in the campus. Furthermore, DTE is also developing a Computer Centre in the institute with 130 PCs through its CET Cell to enhance student preparedness for competitive exams. Apart from these academic achievements, Government Polytechnic, Pen, also emphasizes the holistic development of its students by organising various co-curricular activities, imparting soft skills and entrepreneurial talents and nurturing lifelong learnings. It's commitment to provide latest Skill-based technical education as well as its contribution to industry and society through Consultancy and Community Services is unwavering. The institute's affordable education and support for students through various government concessions, scholarships, and free-ships makes diploma education accessible to all sections of the society. Moreover, initiatives like summer internships and industrial training ensure that students are well prepared for numerous professional challenges in life.

With a vision to become a leading Centre in Engineering and Technology, GP Pen continues to play a vital role in producing competent professionals who contribute to industrial and social growth. Its alumni, who excel in renowned industries, government organizations, and entrepreneurial ventures, stand as a testament to the institute's legacy of excellence.

In summary, Government Polytechnic, Pen, is not just an educational institution but a nurturing ground for future-ready professionals who uphold the standards of technical expertise, innovation and societal contribution.

Amazing Success Story of a Polytechnic Alumni: Sanket Mhatre - A Voice that Echoes Success

In the bustling halls of Vivekanand Education Society's Polytechnic, Mumbai, an engineering student namely Sanket Mhatre discovered a passion that shaped his life's journey. Now a celebrated voice, this artist's transformative journey began amidst the institute's rehearsal halls and diploma engineering skills led him to become a successful sound studio entrepreneur. From his college days, he was interested in theatre. Sanket honed his theatrical skills in theatre workshops, Sanskrit classes and Music coaching, which built his confidence as a performer. These efforts culminated in an outstanding performance at the College's Annual Show, overseen by Ex-Director of the institute, Ms. Saxena. After graduating with technical expertise and a strong artistic foundation, Sanket immersed himself in theatre - acting in Hindi, Marathi, and English plays - and showcasing his work globally at Fringe Festivals. His creativity also extended to directing plays at Mumbai's Kala Ghoda Arts Festival. He was associated with 'The play makers' theatre group. Some of his short films were even got selected for film festivals.

Blending technical knowledge with theatre, Sanket established a 'Band Jamming and Voice Studio', thus beginning a stellar voice artistry career. He did voice acting for many Hollywood, Telugu and Tamil films. He is one of the well-known voice artists in dubbing industry who dubbed for Allu Arjun, Mahesh Babu, Jr. NTR, Naga Chaitanya, Vijay, Vishal, Vishnu Manchu and many other South Indian film actors. In the Wild Show of Discovery Channel, he dubbed for Bear Grylls. Sanket lent his voice for Indian and American films including Deadpool, in which he dubbed for Ryan Reynolds character. He did Hindi voice acting for Hollywood movies such as Hawkeye, Captain America of Marvel Cinematic Universe and for Avengers: Endgame, Shazam and The Dark Knight Rises. He did voice acting for Disney Plus Hotstar's The Legend of Hanuman, in which he lent voice for Shree Ram's character. Now, after 17 years in the industry, Mhatre is one of the most sought-after voice artists, working in web series, animation, audio descriptions, and feature films, both in Hindi and English.

He receives appreciation messages from viewers in Bangladesh, the UK, and Nepal. Now a mentor, Sanket trains aspiring voice artists through workshops and also shares insights and expertise online. Sanket's videos on YouTube and Instagram cover techniques like breathing during dubbing, maintaining the 'perfect distance' between a pop filter and the mouth, dealing with stammering, and setting up a home studio. Today he has turned into a role model for those seeking to pursue innovative and alternative professional paths.

Sanket Mhatre
Voice Over Artiste

Institutional News - Student

Participation in India Russia Youth Summit for Innovators
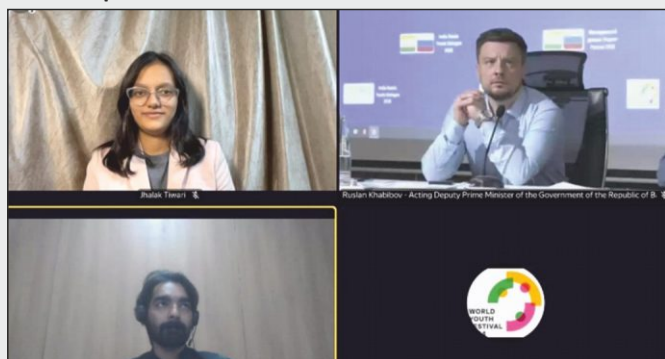
Jhalak Tiwari, a student of Computer Engg. of Thakur Polytechnic, Mumbai, was selected for the India Russia Youth Dialogue for Innovators (online mode) held on 12th Jan. 2025. The summit brought together youth from both India and Russia to exchange their perspectives on a variety of topics, including tourism, sports, education, entrepreneurship, geopolitics, global relations, social media, and many more. Jhalak was honoured for being selected as one of the 500 participants from India and Russia.

## Workshop on "Non-Conventional Energy Generation & Usage."

The Green Club of St. John College of Engineering and Management (SJCEM), Palghar, (Diploma Wing), in collaboration with the Maharashtra Non-Conventional Energy Producer's Association, successfully organized a workshop on "Non-Conventional Energy Generation and Its Usage" on 26th Oct. 2024. Participants engaged in discussions on various topics, including solar and wind energy technologies, biomass utilization, and the integration of renewable energy into existing power grids. A "Nisarg Urja Manual" was distributed to all.

'School Connect' Program of Government Polytechnic, Achalpur

Government Polytechnic, Achalpur, has organised 'School Connect' Program for rural school students and their parents. It has disseminated information about various academic courses, scholarship scheme, admission process, employment opportunities available through polytechnic education. In this regard, Shri. Anant Raut, Principal and Shri. Nikhil Tiwari, Lecturer, Civil Engineering, have visited various Government Secondary and Higher Secondary Aashram Schools in the district.

Student Achieves Prestigious Google Badge
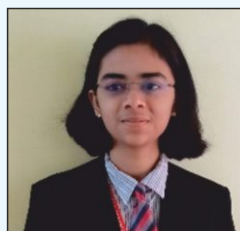
Ms. Vedika Prashant Chandratre, a student from the Computer Department at Guru Gobind Singh Polytechnic, Nashik, has earned the esteemed 'Google Badge' on 21st Nov.2024 for her groundbreaking work on large language models and their application in AI principles using Google Cloud. This accomplishment highlights her exceptional skills & dedication in the fast-paced Silver League.

Silver Medal in INTERNATIONAL KARATE-DO Championship

Maveez Mansoor Sayyed, student of Computer Engineering Department of Anjuman-I-Islams K R Kalsekar Polytechnic, Navi Mumbai, made a remarkable achievement at the FUMOKAI CUP INTERNATIONAL KARATE-DO CHAMPIONSHIP. He has secured the Silver Medal in Kumite and Bronze Medal in Kata (55kg category), showcasing his exceptional dedication.
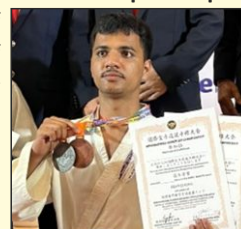
Gold Medal at Mardani Sports Nationals 2024

Varun Sandge, student of Civil Engg. at VES Polytechnic, Chembur, has secured the Gold Medal at the 3rd Mardani Sports National Championship 2024 showcasing his exceptional perseverance. The event was held from 20th to 22nd December 2024 at Shri. Chh. Shivaji Maharaj Sports Complex, Jalgaon, Maharashtra.

Sasmira Boxing Tournament 2025

Om Shinde, a student of Mechanical Engineering of Shri. Bhagubhai Mafatlal Polytechnic, Mumbai, had participated in Sasmira Boxing Tournament 2025 which was organized by Sasmira's Institute of Commerce & Science & conducted by the Mumbai Dist. Boxing Association on 21st & 22nd January 2025.

Techfiesta-2K24

Shri Sai Shikshan Sanstha's NIT Polytechnic, Nagpur, in association with the MSME-Development & Facilitation Office, Nagpur, has organized the "Management Development Program on Industrial Management" from 14th to 18th Jan. 2025. The program aimed to provide insights and knowledge on various aspects of Industrial Management, Human Resource Management, and other related topics. The program was inaugurated by Smt. Parineeta Pandhram, Assistant Director, MSME-DFO, Nagpur. Over the course of five days, the program featured a range of speakers who delivered the session on various topics.

IEI's 'Excellent Institute Award 2024'

The Institution of Engineers (India) (IEI) held the 17th IEI Industry Excellence Awards and 4th IEI Engineering Education Excellence Awards ceremony on 19th Dec. 2024 at the Novotel Hotel & Residences, Kolkata. The IEI Education Awards 2024 celebrated educational institutions demonstrating leadership in innovation & academic excellence. Padm. Dr. V. B. Kolte College of Engineering, Malkapur, was honoured with the prestigious 'Excellent Institute Award' for their outstanding efforts in engineering education.

FDP on Refining Teaching Skills and Methods

A one week FDTP was successfully conducted by Dr. Panjabrao Deshmukh Polytechnic, Amravati from 21st to 25th October 2024. FDTP successfully provided educators with valuable skills and resources to enhance teaching methods through innovative research. By integrating innovative research and collaborative practices, the program aimed at contributing a culture of continuous improvement in teaching and learning.

CoE in Robotics & Automation at Govt. Poly., Chh.Sambhaji Nagar
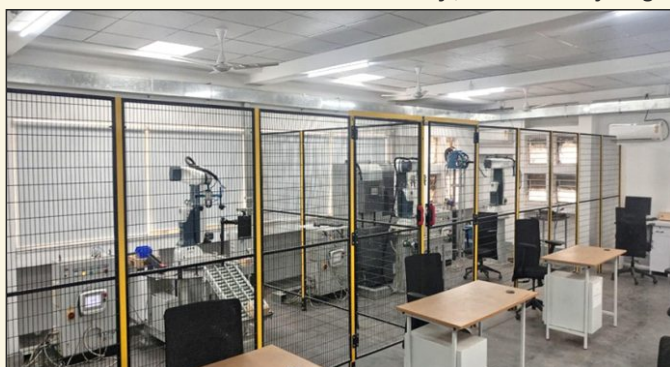
MSBTE has recently established a Centre of Excellence in Robotics and Automation, in collaboration with Autofina Edutech, at Government Polytechnic, Chhatrapati Sambhaji Nagar. This state-of-the-art facility is equipped with advanced industrial robots and a wide range of automation technologies. The initiative is designed to empower students with cutting-edge skills in robotics and automation, preparing them for the evolving demands of the industry.

PhD Awarded

Dr. Vinita Palsingankar, Lecturer, Civil Engg., Govt. Polytechnic, Chh. Sambhajinagar, has completed her Ph.D. from Dr. Babasaheb Ambedkar Marathwada University, Chh. Sambhajinagar. Her thesis titled "Integrated Urban Stormwater Management" was conducted under the guidance of Dr. R. V. Shetkar, Professor, Govt. Engineering College, Chh. Sambhajinagar.

Dr. Sujata Jagtap, lecturer, Electronics Engg., Govt. Polytechnic, Chh. Sambhajinagar has completed her Ph.D from Dr. Babasaheb Ambedkar Marathwada University, Chh. Sambhaji Nagar in Dec. 2024. Her thesis titled "Improving Run Time Efficiency of Semantic Video Event Classification " was conducted under the guidance of Dr. Sudhir Kanade, HoD ETC Deptt., Puranmal Lahoti Govt. Polytechnic, Latur.

Dr. Varsha Khandekar, Lecturer, Information Technology, Govt. Polytechnic, Thane has completed her Ph.D. from Chh. Shivaji Maharaj University, Panvel on 25th November 2024. Her thesis titled "A Trust Based Secure Multi Path Routing Protocol in Wireless Sensor Network" was conducted under the guidance of Dr. Praveen Gupta, Professor, Chh. Shivaji Maharaj University, Panvel.

Dr. Sadaf R Suryawanshi , Lecturer, Information Technology, Govt. Polytechnic, Thane has completed her Ph.D. from Chhatrapati Shivaji Maharaj University, Panvel, on 2nd December 2024. Her thesis titled "A Novel Approach for Improving Security Performance in QoS Aware IoV Networks" was done under the guidance of Dr. Praveen Gupta, Professor ,Chh. Shivaji Maharaj University, Panvel.

Faculty Achievement

Mr. A. R. Lande and Mr. S. B. Raijade, Faculty from Mechanical Engg. Department of K K Wagh Polytechnic, Nashik have successfully completed a six-month All-India Council for Technical Education (AICTE) Quality Improvement Program (QIP) PG Certificate on Artificial Intelligence (AI). This prestigious program was conducted at the renowned Indian Institute of Information Technology (IIIT), Kottayam, (under guidelines of AICTE), emphasizing advanced concepts & applications in Artificial Intelligence. Certification Program was conducted over an extensive period from July 2024 to December 2024 and involved rigorous coursework and project work as prescribed in the curriculum. It provided a platform for learning cutting-edge advancements in AI, a transformative field shaping the future of technology and innovation.

Dr. Nilesh Patil has made remarkable contributions to Network Security & Software Defined Networking, with 13 research articles published in prestigious SCI-indexed journals by publishers like Springer, Elsevier, and Wiley. He published 7 articles in 2024 &recently added another in 2025. His latest work, featured in Computer Science Review (Elsevier), stands out with an impressive impact factor of 13.3, highlighting his research's high-quality & influential nature.

India, The Global Guru: Reviving its Legacy through Natural Wisdom, Talent, & Technology for the Future

In India, education has long been the most revered cornerstone of progress. It has catalysed the permeability of education into technology and technology into education - transforming the way knowledge is disseminated and skills are inculcated. For more than a thousand years, India has been an idea that shaped the world-wide-wisdom.

Long before Oxford and Harvard, seekers from across the world flocked to India's legendary centres of learning - **Vikramshila, Nalanda, Takshashila, Vallabhi, Nagarjuna, and Kanthalloor**. This wasn't just education; it was an ecosystem of wisdom, knowledge, innovation, and holistic thinking — for example: philosophical prudence.

Fast-forward now, India has evolved with its natural DNA of wisdom in whatever it does - showcasing global talents, technology and trade. **India stands at the cusp of reclaiming its Global Guru legacy**. With the right mix of **philosophy, policy, talent, and technological prowess**, we are setting the foundation for a new era where India **leads the world in education, research, and workforce development**.

This isn't about catching up with world. This is about leading it.

I. The Guru Returns: India's Next Educational Revolution: India, a talent powerhouse, today needs a **direction, opportunities and the ecosystem.** It is already embracing cutting-edge emerging technologies like Artificial Intelligence (AI), Augmented Reality (AR), and the Internet of Things (IoT), thus making education more inclusive, interactive, and aligned with the demands of a rapidly evolving world. The 21st-century education model will be driven by **"AI-powered hands-on immersive innovation"**. India, reinforced by states like Maharashtra, through its policy prowess and strategic intervention through channelising **wisdom, talents, and emerging technologies** is going to **become the primary hub for global talent, and innovation.**

II. Wisdom: Reconnecting with India's Intellectual DNA: The **Indian education system** (recall Gurukul) focused on **multi-disciplinary learning, real-world application, and deep introspection -** a philosophy that the world is now rediscovering through experiential education models. For example, Economics, Policy, and Economic Policy were practised by Kautilya of Magadh (present-day Bihar) in India 2500 years ago — are still more prudent than many new economic thoughts. Today, India's renewed focus on education and policy shift towards emerging tech is well appreciated in the intellectual corners. The **NEP 2020** has laid the groundwork, but to truly revive our Global Guru status, we need **global policy partnerships, advanced research hubs, and AI-driven knowledge networks**. Few important ones are:

- **Policy Shift Towards Deep Learning** - Moving beyond exam-based rote learning to **competency-driven education**.
- **Merging Ancient Thought with Modern Science** - Applying **Vedic Mathematics, and Indigenous Engineering wisdom** to contemporary problem-solving.
- **Gurukul 2.0: The Digital Age Renaissance** - Creating **immersive learning ecosystems** that blend AI, case-based learning, and industry apprenticeships.

III. Our Talent Making India Global Skills Magnet: World, going through a **severe skills crisis**, has gaps in **Engineering, AI, Robotics, Healthcare, and Sustainability**. India possesses the largest youth workforce, and this demographic advantage should be transformed into a knowledge brigade, not solely to create skilled experts but to establish itself as the world's preferred knowledge hub. We have started the move:

- **Global Skills Mobility Framework** - Creating policies that make Indian qualifications **internationally recognized** (like Germany's Dual Education Model).
- **Industry-Integrated Education** - Expanding initiatives like **TISS-SVE's Work-Integrated Learning Model** and **MSBTE's Centres of Excellence in Cutting edge Technologies**.
- **India as the Global R&D Factory** - Encouraging **Indian universities and startups** to lead in **Deep-tech Research and Applied Science**.

IV. Technology Powered Future of Learning: Technology is poised to scale the learning ecosystem. India has the unique advantage of a **thriving IT ecosystem**, and a **government willing to experiment with appropriate policy intervention**. These innovations will **bridge the urban-rural divide making India's workforce truly future-proof.**

Some key focus areas include:

- **AI-Powered Adaptive Learning** - Leveraging **NEAT 2.0** to **personalize education** and upskill millions.
- **Metaverse Classrooms & AR-Based Training** - Creating **immersive simulations** for poly. and engineering students.
- **Blockchain-Based Certification** - Ensuring **tamper-proof credentials and global skill portability**.
- **Public-Private EdTech Collaborations** – Expanding partnerships like **Microsoft India & Maharashtra's Smart Education Initiative**.

V. The Policy Roadmap: From Vision to Execution: For India to **reclaim its Guru status**, I suggest some **bold policy shifts** that align **education with economic growth and global influence**. Key interventions include:

- **National AI-Driven Skills Authority** - A **real-time skills mapping system** aligning education with industry needs. Blockchain will come in handy.
- **Global Skills Recognition & Migration Pathways** - Formal agreements with countries like **Germany, Singapore, the UK, and Australia** for cross-border talent movement, conveniently.
- **Green & Future-Ready Curriculum** - Making **Sustainability, AI, and Industry 5.0** mandatory in technical and vocational training.
- **Micro-Credentials for Lifelong Learning** - Creating an **India-led Global Certification System** for **continuous workforce upskilling**.
- **Revive/establish global learning hub in India -** educators and learners will flow. India is a dream-catcher too.

This isn't just a reform—it's a transformation. The Global Guru is Rising Again. This is our moment. The World is Watching.

Arbind Kumar
Renowned Business Accelerator and Mentor

From Ancient Wisdom to Global Leadership: India's Knowledge Economy

By India's 100th year of independence, our education system will not only be producing graduates — but also **setting global education benchmarks** — not a far-fetched optimism, but a deliberate policy pathway.

- **Access to every student to personalized AI tutors.**
- **Our graduates leading smart manufacturing hubs globally.**
- **Indian universities defining the future of AI, healthcare, and sustainable tech.**
- **India's top talent & best-in-class education remodelling the world.**

Glimpses of MSBTE's Industrial Trainings for Faculties.......

MSBTE has arranged Industrial Training Program at **Lauritz Knudsen Electrical & Automation, Pune** for the faculties of Electrical Engg. Dept. titled "**Selection of LV Switchgear & its Application**" from 30th Dec. 2024 to 3rd Jan.2025.

MSBTE has arranged Industrial Training Program at **Nashik Engineering Cluster, Nashik** for the faculties of CO, Electrical Engg., EX, ME Dept. titled "**Full Stack Development Introduction of Python**" from 16th to 20th Dec. 2024.

MSBTE has arranged Industrial Training Program at **L & T Skills Trainer's Academy, Mumbai** for the faculties of Mechanical Engineering Dept. titled "**Modern Manufacturing**" from 9th to 13th Dec. 2024.

MSBTE has arranged Industrial Training Program at **Central Institute of Petrochemicals Engg. & Technology, Ch. Sambhaji Nagar** for faculties of CH & ME Engg. Deptt. titled "**Plastic Processing Techniques, Testing & Quality Control of Plastic Products**" from 30th Dec. 2024 to 3rd Jan. 2025

Feedback....

I would like to submit that MSBTE newsletter allows their readers to connect directly with recent updates through its various informative columns. The newsletter presents the overall scenario of the activities and events organised by the polytechnics across the state. The theme-based views of Industry persons, academicians and students are also published along with the success stories of a polytechnic and an entrepreneur alumni. I would like to suggest that the newsletter should contain the schedule of forthcoming curricular and co-curricular events related to MSBTE affiliated Institutions. It will help the stakeholders to plan the activities in advance. During Student Learning Activities (SLA) for first year, a common reading session can be held in which message of Hon. Director/ Secretary, MSBTE, lead articles, views on the theme, success stories can be read. This will make students accustomed to reading. I extend my heartfelt thanks to MSBTE and my all colleagues for being so great to work with and for seeing me through the challenging times as I am retiring at the end of January 2025.

Prof A.G. Raut
Principal, Government Polytechnic, Achalpur

I must congratulate the MSBTE newsletter team for the quality and consistency observed in publishing the newsletter in spite of their busy schedule. We are existing in an era of 21st century education where we come across the various digital platforms and enjoy the feel of learning. As a teacher I personally feel that MSBTE Newsletter Committee shall now establish a smart digital platform in which reader/ content providers can directly submit their views, photos and articles through interactive mode, may be through a special tab or link whatever is possible at software end. Free access to previous issues must also be provided for the content provider to know the pattern and type of content required in the same platform. This will help the content provider to put their views and thoughts in a proper format and in a required manner. Since, readers will come across the digital newsletter platform, reader count will also amplify to some extent. While shifting to digital mode, it is essential to take into consideration cyber security and privacy issues at the official level. The articles received through this mode can be screened at regional level and then forwarded to head office for final screening. But this doesn't mean that the offline task of newsletter can be put to an end. The traditional way of collection of newsletter information and article will also continue. The best possible articles compiled through different modes can be selected for publication to make it more informative and popular. It's only my own suggestion as a reader.

Mr. Arvind. Deshmukh
Lecturer, Mech.Engg, Government Polytechnic, Murtizapur

The theme of current issue of the MSBTE Newsletter is truly praiseworthy for its focus on innovation in teaching and learning. As an educator, I appreciate how it highlights not just technological advancements but also the active role of faculty and students in enhancing educational quality. This emphasis aligns perfectly with contemporary teaching methodologies, which prioritize collaborative and learner-centered approaches. The articles on AI's role in education are going to be insightful. Technologies that support remote learning, provide real-time feedback, and enable progress assessment are crucial for addressing the diverse needs of today's students. As faculty, I see significant potential for these tools to complement traditional teaching methods, making learning more personalized and efficient.

Mr. Vasim Hamif Mansuri
Technical Assistant, Mechatronics Dept., Guru Gobind Singh Poly., Nashik