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Workshop on "Innovative Teaching Methods: Boosting Student Engagement and Academic Success"

Department of **Chemistry, Physics and Mathematics** organised a **Workshop** on **"Innovative Teaching Methods: Boosting Student Engagement and Academic Success".** The workshop was conducted on 15.11.2025, 22.11.2025 and 29.11.2025 at **10:00 am**, in **Seminar Hall 2**. The Guest Speaker was **Dr Ashok Rao**, Former Head, Network Project, CEDT, IISc Bangalore and **Dr Arulalan Rajan**, Founder and Director, Vidyakosha Private Limited, Bangalore (Formerly, Faculty, NITK Surathkal), Adjunct Professor, RVCE, Bangalore. The inauguration of the workshop started at 09:30 am, followed by the introduction of the guest speaker. On behalf of the Department of **Chemistry, Physics and Mathematics,** Dr Hameem

Dr Hameem Shanavas, Dean of Student Affairs, presenting a sapling to Dr Ashok Rao

Shanavas, Dean of Student Affairs, presented a sapling to Dr Ashok Rao.

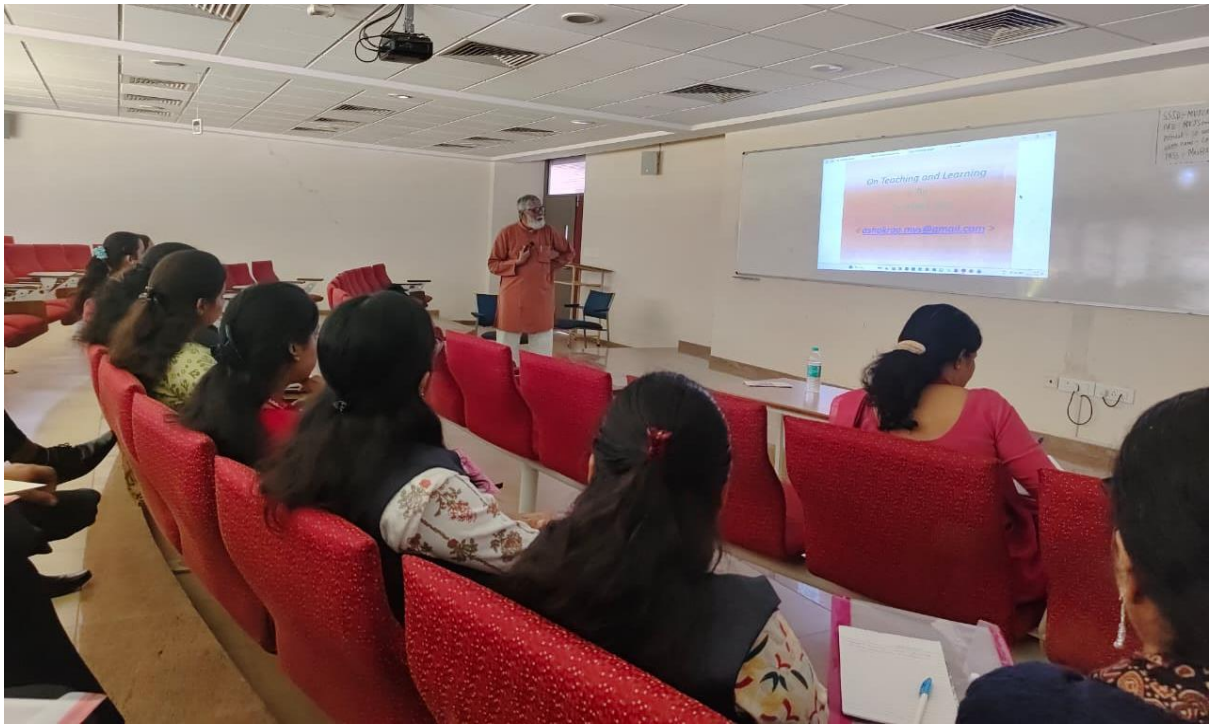
Introduction

The workshop on "Innovative Teaching Methods: Boosting Student Engagement and Academic Success" brought together educators, researchers, and academic leaders to explore cutting-edge approaches in education. This workshop aimed to empower faculty with innovative teaching strategies that enhance student engagement and academic performance through expert-led sessions by distinguished educators from IISc and NITK Surathkal. The program will explore modern pedagogical integration in approaches, teaching, research,

curriculum design, interdisciplinary models, and digital assessment tools. It seeks to foster inquiry-based and project-oriented learning, promote critical thinking, and prepare educators to meet the evolving demands of 21st-century learners. The program also encourages the application of innovative assessment techniques through hands-on activities that simulate real classroom scenarios. The event focused on enhancing student involvement, improving learning outcomes, and adapting to modern educational challenges. Key sessions covered specialised pedagogies, research integration, curriculum design, assessment innovations, and practical learning strategies. Over 150 participants attended virtually and in-person, with interactive discussions and case studies emphasising real-world applications.

Session 1: Pedagogy of Engineering Teaching

This session delved into tailored teaching strategies for engineering disciplines, emphasising active learning over traditional lectures. Key highlights included problem-solving simulations, flipped classrooms, and collaborative projects using tools like CAD software and virtual labs. Presenters stressed the importance of integrating industry-relevant skills, such as ethical decision-making and teamwork, to boost student motivation. Outcomes showed that students in engineering programs using these methods reported 20-30% higher engagement rates, leading to better retention and innovation in technical fields.



Dr Ashok Rao giving a lecture on Pedagogy of Engineering Teaching

Session 2: What is Research and Why Do Research?

Participants explored the fundamentals of research as a systematic inquiry process driven by curiosity and problem-solving. The session highlighted reasons for pursuing research, including advancing knowledge, fostering critical thinking, and addressing societal issues. Interactive exercises demonstrated how undergraduate research opportunities enhance academic success by building skills in data analysis, hypothesis testing, and communication. Attendees discussed barriers like resource limitations and proposed mentorship programs to make research accessible, ultimately linking it to higher student persistence and career readiness.

Dr Ashok Rao explaining about the research carried out in a remote village

Session 3: Importance of Curriculum - Curriculum Reforms and Need for Interdisciplinary and Outreach Models

This session examined the role of curriculum as the backbone of education, advocating for reforms to align with evolving job markets and global challenges. Emphasis was placed on interdisciplinary models that blend subjects like STEM with the humanities, promoting holistic learning. Outreach initiatives, such as community partnerships and online modules, were presented as essential for inclusivity and real-world impact. Case studies from reformed curricula showed improved student outcomes, with interdisciplinary approaches increasing engagement by encouraging cross-field collaborations and addressing diverse learner needs.

Dr Ashok Rao giving a talk on the curriculum

Session 4: Innovative Assessment Practices

Focusing on moving beyond exams, this session introduced creative evaluation methods like peer reviews, portfolios, and gamified quizzes. Speakers showcased how formative assessments provide ongoing feedback, reducing anxiety and enhancing understanding. Tools such as AI-driven analytics were discussed for personalised grading. The session concluded that innovative practices lead to fairer evaluations and higher academic success, with data indicating a 15-25% improvement in student performance when traditional tests are supplemented with dynamic assessments.

Session 5: Inquiry-Based Learning and Digital Assessment Platforms

Inquiry-based learning was presented as a student-centred approach where learners pose questions, investigate, and draw conclusions, fostering deep understanding and curiosity. Integrated with digital platforms like Kahoot, Google Classroom, and adaptive learning software, the session demonstrated how these tools enable real-time feedback and collaborative inquiries. Benefits included increased engagement through interactive simulations and data tracking, with examples showing enhanced critical thinking skills. Digital platforms were highlighted for scalability, especially in large classes, supporting diverse learning paces.

Session 6: Project-Based Learning for Real-World Skill Development and Innovative Pedagogies for 21st Century Learners

This combined session explored project-based learning (PBL) as a hands-on method where students tackle authentic problems, developing skills like problem-solving, collaboration, and adaptability. Examples included capstone projects in sustainability or tech innovation. Innovative pedagogies for the 21st century, such as blended learning, VR/AR integration, and competency-based education, were discussed to prepare learners for a digital, globalised world. Outcomes emphasised that PBL boosts retention by 40% and equips students with transferable skills, while modern pedagogies address equity and lifelong learning.

Dr Arulalan Rajan explaining about Innovative Pedagogies

Valediction

Dr Arulalan Rajan and the participants

The valediction of the workshop started at 3:45 pm and ended at 4:00 pm. The workshop underscored the transformative potential of innovative teaching methods in elevating student engagement and academic success. Key takeaways include the need for adaptable curricula, research integration, and technology-enhanced assessments. Recommendations for educators involve piloting interdisciplinary projects and leveraging digital tools. Future workshops could expand on AI in education. Overall, the event inspired actionable strategies to create dynamic, inclusive learning environments.