Innovations by Faculty in Teaching Learning Process

In order to enhance the effectiveness of conventional teaching and learning, various measures have been adopted. The web-based learning and ppt presentations do not completely replace the conventional teaching and learning. However, these aid to improve the teaching and learning. Few of the innovative techniques adopted in the department is briefly tabulated below.

Use of ICT	•Video based learning •PowerPoint presentations
Instruction delivery	•Flipped classrooms, Online lectures, NPTEL videos, YouTube Videos, Animations, MOOC courses.
Instructional methods	•Google Classroom, Open Board, Video recordings, Concept based assignments
Inclusive classrooms	•Model based learning, Participative learning, Field visits
Assessment and Evaluation	•Online assignments, class works, Quiz, Internal assessments

1. Video based learning and assessment

All our classrooms are equipped with projectors to facilitate the faculties to conduct ppt presentations and demonstrate the concepts through videos of working examples. Even though a plethora of videos demonstrating scientific concepts are available on the internet, it is important to guide the students to learn from it. With this purpose video-based assignments have been given to students in several subjects. Students are even encouraged to submit short videos delivering maximum information in a short period of time as part of the course assignments. NPTEL videos are shared with the students through google classroom platform. Faculties also employ Flipped classroom method to improve the teaching and learning process. Figure 1 shows a screenshot from YouTube video lectures delivered by Prof.

Anilkumar K N, faculty ME Department at RIT Kottayam. The lecture links are even shared with the students before the commencement of the classes.

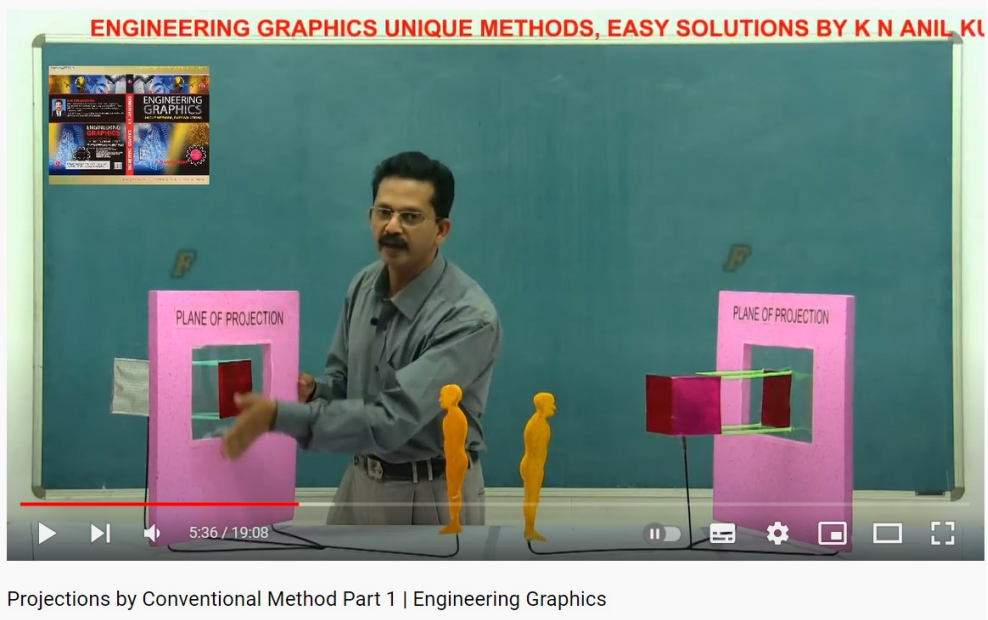

Figure 1: YouTube video lectures by Prof. Anilkumar K N, faculty ME Department at RIT Kottayam.

2. Field visits to small and medium scale Industries

Frequent visits are arranged to nearby Industrial areas to learn and relate the subjects in their curriculum. These give students the opportunity to identify better ways to achieve certain tasks. Students identify problems during such visits and take up projects relevant to the industry.

Figure 2: Photograph of a field visit to Kerala State Rubber Cooperative Limited, Mattress Division (left) and a model of the incinerator system developed for the company (right).

3. Model based learning and assessment

Building of physical models are relevant in modern days even though ICT based methods are available. Students learn the subjects from building a model. A model-based assessment has been done for the subject Engineering graphics. Typical 3D models created by students are shown in Figure 3. Demonstration of the concepts with the help of models helps the students to better understand the concepts. A sample model of the elliptical trammel mechanism used to enhance the effectiveness of conventional teaching of Theory of Machines classes is shown in Figure 4.

Figure 3: Sample 3D models created by First year students as part of the Engineering Graphics Course.

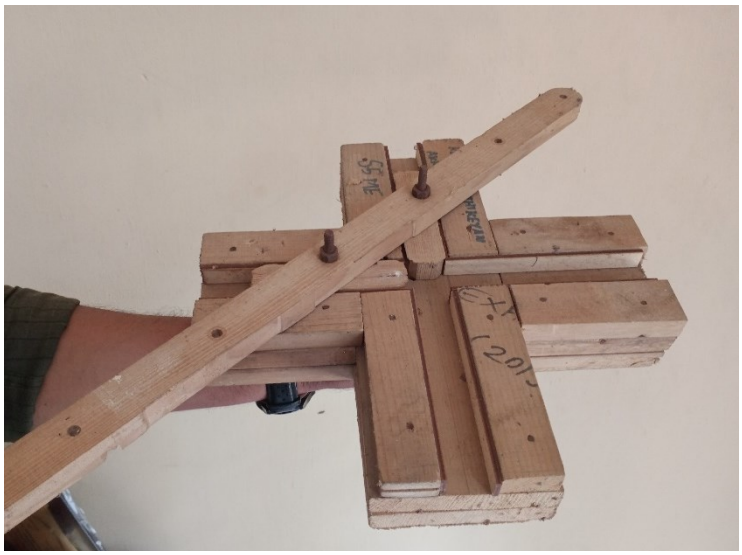

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Figure 4: Model of an elliptical trammel mechanism used by Prof Antony J K for teaching Theory of Machines classes.

4. Use of Learning Management Systems parallel with conventional classroom learning

The pandemic period has seen the widespread use of online platforms for conducting the classes. Most of the activities migrated to online mode from offline mode. Although it helped to conduct the classes smoothly, it cannot be considered as a perfect alternative to the conventional teaching methods. However, LMS platforms were used as a supporting system for enhancing the learning, submitting assignments and sharing study materials and instructions. The resources are shared with the students in Google classroom platform as shown in Figure 5 and the students are able to access the same at any instant. By using the raise hand options, students were able to engage in systematic discussion with the faculties. The sessions were also recorded for future use. The faculty members were also able to download the daily attendance lists and assignment submission details also. Several other platforms such as open board are also used by the faculty members.

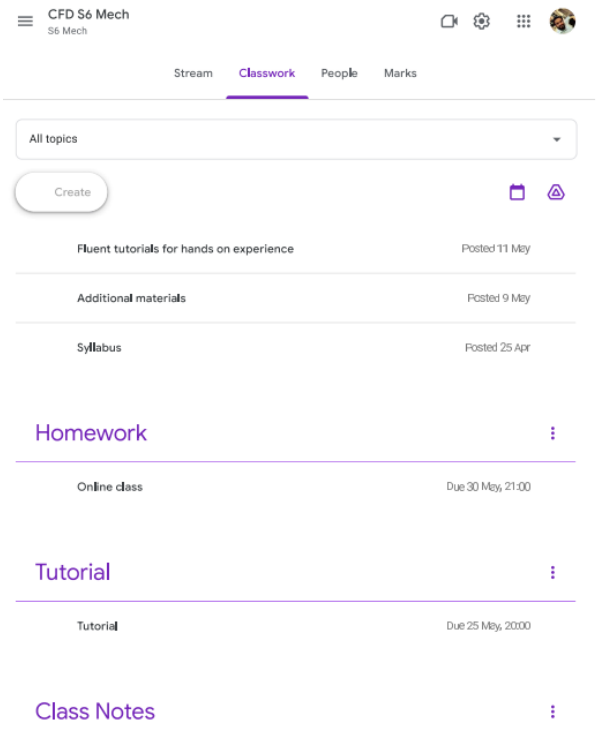

Figure 5: Use of Google Classroom for online classes

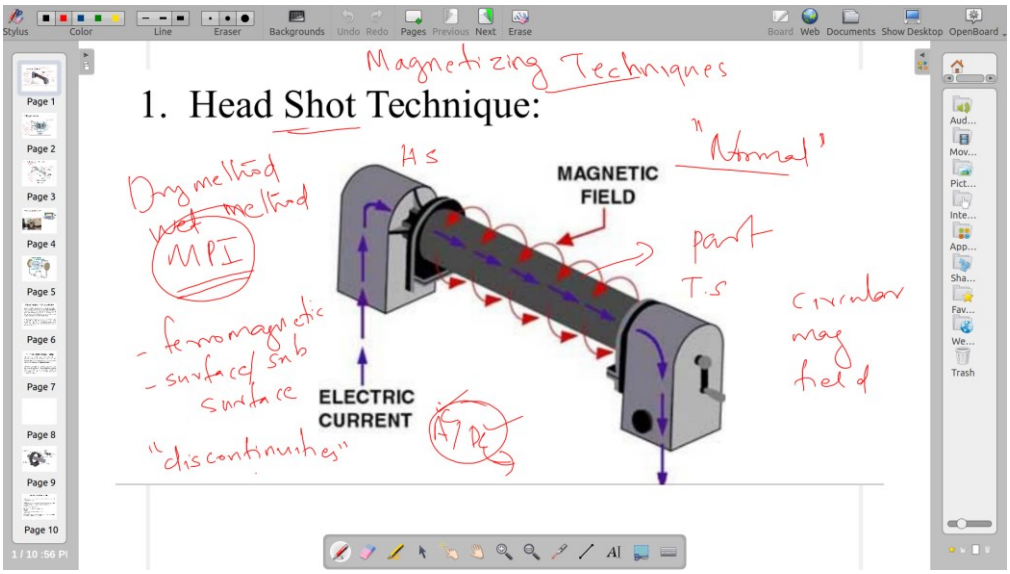

Figure 6: Use of Open board platform by Prof. Vishnu R, Assistant Professor, RIT ME Department.

5. Encouragement for participation in technical competitions and exhibitions

Students are encouraged to participate in technical events such as Young Innovators Programme conducted by the Kerala Government, project competitions conducted by SAE etc. Here, students learn and apply engineering concepts and new tools to complete the project. Figure 7 shows the Sub- Collector of Kottayam interacting with the students during such an expo.

Figure 7: Sub-Collector Kottayam interacting with the students during an expo.

6. Encouraging students to attend MOOC courses

NPTEL local chapter has been established in the college. Subscriptions to the MOOC platform, SWAYAM, Coursera etc facilitates the students and faculties to learn from MOOC courses offered by renowned institutions in India and abroad. For Minor and Honour degrees, the university has approved crediting of MOOC courses as part of the curriculum.

7. Project funding schemes

Students are encouraged to participate and apply for project funding schemes under TEQIP and CERD. These provide financial support to students in completing the projects.

Figure 8: TEQIP Funded student project: Mat punching machine (Industrial project). Faculty in charge: Shri. Antony J K, Assistant Professor, RIT ME Department

Figure 9: CERD Funded student project: Agrobot. Faculty in charge: Shri. Sidharthan, Assistant Professor, RIT ME Department