



Shri Aillak Pannalal Digamber Jain Pathashala's

WALCHAND INSTITUTE OF TECHNOLOGY

(An Autonomous Institute)

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1. Title of the Practice:

Disruptive Innovations in Teaching-Learning (T-L)

2. Objectives of the Practice

- To provide a platform for faculty members to share and exchange views/suggestions regarding ET research & experiments, a way to improve T-L process continuously.
- To blend various learner centric strategies and ICT tools in T-L process to enhance learning outcomes, while addressing diverse student groups.
- To review ET activities periodically & provide expertise/guidance through regular meetings & follow ups.
- To engage teachers in peer discussions and assessments of the resources created and to make available course contents in the form of videos, OER etc. and create Learner Centric MOOC (LCM).
- To facilitate students to learn anywhere, any times and many times.
- To facilitate faculty members to save some time due to creating e-contents & use of ICT for utilizing it efficiently for other academic activities.

3. The Context

Various studies have proved again and again that concentration of students in a class is observed to be @12minutes. Therefore, even though teacher is teaching sincerely & effectively, it has been always the million-dollar question “Are students learning?”.

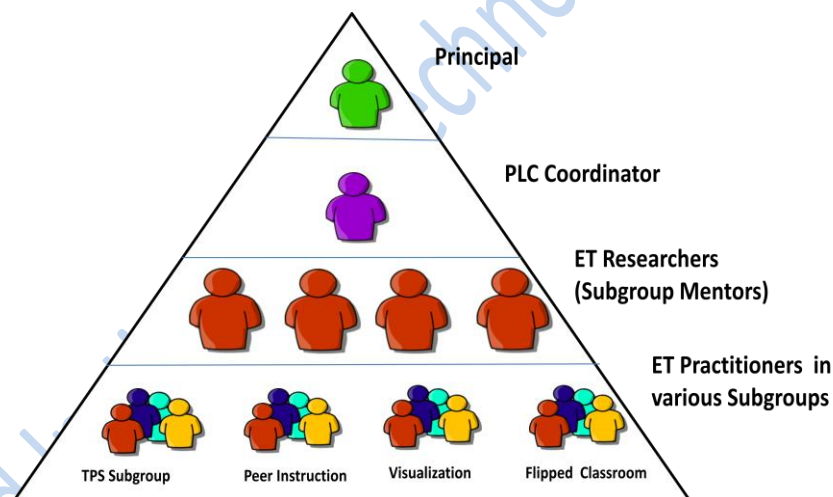
In the view, to overcome this weakness, Institute is practicing disruptive innovations where students can learn anywhere, anytime, many times. This includes e-content generation @e-Learning Center, implementation of Learner Centric MOOCS (LCM),

Blended teaching-learning Process while employing ICT & instructional strategies. For this purpose, institute has set two MOODLE servers for e-contents deployment, assessment and feedback.

Unprecedented Covid 19 Pandemic pressed education sector to switch from physical/blended teaching mode to totally mandatory online teaching mode. During this pandemic, the primary objective was to ensure uninterrupted & effective teaching-learning (T-L) through online mode.

In spite of lock down we succeeded in our commitment to engage T-L virtually, with overnight smooth shift from physical/blended classroom to totally an online mode. This has become possible due to inculcation of blended T-Lin earlier years under Professional Learning Community (PLC).

PLC is a blended formulation of administration as follows:



PLC Organizational structure

4. The Practice

Institute adopted following disruptive innovations under PLC:

- **Creation of course e-contents**

For generating quality course e-content, we have established recording studio titled 'E-Learning Centre' at our institute. The e-learning center has facility of lecture capturing and live lecture streaming. Faculty members use various forms of content presentation in video creation such as PowerPoint presentation, demonstrations of various

tools/simulators/coding in various programming languages, animations, simulations etc. Faculty members also use document camera for demonstrating derivations, problem solving similar to conventional teaching methodology. Through continuous monitoring, peer review, experimentation and counseling, the results have been achieved to empower teachers to create course content in form of videos for the benefit of learners. Standards and guidelines are set for video creation by PLC for ensuring minimum quality standards and bringing uniformity. Some of the guidelines are: every video shall contain Learning outcome/s aligned to Bloom's Taxonomy, reflection spots to trigger students to think & reflect, citations, plagiarism check and common creative license and follow presentation format. Now, institute has set a well-defined process for video creation.

Continuously every semester, faculties are adding videos in a phased manner, at least 5 videos per semester. During 2020-21, 1186 videos are created. By the end of A.Y. 20-21, total 3454 videos are created and uploaded on institute YouTube channel.

(<https://www.youtube.com/channel/UCb9okJF6NGPDUGgAQxu3TcA>)

- **Creation of Learner Centric MOOCs and Course (Partly) delivery through LCM**

On completion of MOOC course ET702x: Designing of Learner Centric MOOCs by IIT Bombay, every faculty member is creating Learner Centric MOOC (LCM) partially using created videos on Institute MOODLE server since 2018. In addition to watching the videos, students also carry out activities based on the content of the videos and accordingly they are assessed. To begin with, initially 5-10% curriculum was covered through LCM and gradually it was increased and now @25% curriculum is covered through LCM. Every semester every teacher creates at least one LCM (partial course) on MOODLE.

Implementation of LCM includes design of course, schedule for release of course and Feedback. These LCMs are deployed on institute MOODLE spread over the semester as per predefined schedule.

- Design of LCM components: Learning Dialogues (**LeD**)/**videos**, Learning by doing (LbD) activity & Assignment
- Feedback from students on LCM activity
- Review on student feedback, corrections, if required and further planning: Reforms/addition/alteration in LCM

- **Continuous use of different Instructional Strategies and ICT tools during course delivery**

On completion of formal training in ET through various FDPs/MOOCs, now, faculties are employing instructional strategies & ICT Tools during content delivery. Thus, the conventional T-L process is strengthened by blending following ET practices for active learning.

Use of Instructional Strategies/Tools/Innovations:

At the commencement of semester, every faculty member submits course plan along with ET Activity planning. Activity planning template includes name of topics, name of instructional strategies and/or ICT tools to be employed, Schedule for activity etc. Some of instructional strategies & ICT Tools used are:

Instructional Strategies:

Gamification, Project-based Learning, Problem based Learning, Role Play, Jigsaws, Visualization (Animation, Simulation, Live Coding etc.), Flipped Classroom, Teaching by Example, Collaborative Competitive Learning, Competitive Learning, Collaborative Learning

ICT Tools:

Virtual Lab, Virtual Programming Lab (VPL), BodhiTree, Socrative, Kahoot, Bubblino, ModelSim, Selenium, LogicSim, Weka, Parsing emulator, JFLAP, Visualization Tutor, RapidMiner, Pentaho, JasperReports, Tableau, Cassandra, Wireshark, NS2, Simulation Tools (8085, Keil, MPLab, Protous, VLSI Design etc.)

Coding Platforms Like HackerRank, HackerEarth, CodeChef are used regularly for enhancing programming skills and for programming contests.

On an average 12 instructional strategies & 10 ICT tools are employed in T-L process in an academic year leading to enhancement in student's learning and making T-L process joyous experience.

- **Use of Learning Management System (LMS):**

Two MOODLE servers are installed at our institute, which to all students and faculty from outside campus too. This platform is effectively used for deploying LCM, Feedback on T-L process, Training & Placement activities etc.

Virtual Programming Lab (VPL) on MOODLE is effectively used for all programming languages benefitting both students and faculty. Students can run pro-grams interactively. Also, Faculty members evaluate programming assignments by setting various test cases. VPL is also used for programming contests effectively.

During A.Y. 2020-21, @211 partial LCMs were deployed. Three ISE tests for every course and T&P activities (aptitude tests and programming tests) are carried out on MOODLE.

- **Online Teaching-Learning during pandemic**

During COVID-19 Pandemic, online lectures and discussion happened through various platforms like Zoom, Google Meet, Webex, Microsoft Teams, YouTube etc. All these platforms were studied based on various parameters such as cost, number of users, internet bandwidth required, various features offered and Students' Feedback and now GoogleMeet is used for delivering online lectures. One more reason to use GoogleMeet is that all faculty members have G-Suite accounts which provide additional features in GoogleMeet.

For communication, assessment and deployment for e- contents, Google classroom, YouTube Channel are used along with institute MOODLE server.

We have not only gone for online lectures but also laboratory experiments up to the considerable extent through Virtual Labs (VLabs), a project initiated by the MHRD, Government of India, under the National Mission on Education through Information and Communication Technology. Total 379 experiments are planned & completed from Second year to Final year 71 courses during A.Y. 2020-21.

Assessment

Formative and summative assessments are carried out to assess students' engagement & learning using various proven forms such as MCQ tests, crossword puzzle, quizzes, survey questionnaire, rubrics etc. In addition to conventional ways of assessment

different ICT tools are employed for effectiveness and immediate feedback on content delivery. Continuous Assessment as well In-sem assessment is carried out through MOODLE, Google Classroom, Google Forms, Vlabs, Socrative, Kahoot tools etc.

5. Evidence of Success

- At the end of A.Y. 20-21, videos uploaded are 3454. Subscribers of this channel are 22993 and views are 3421803 for our WIT Solapur – Professional Learning Community YouTube Channel.

These videos are found useful across the globe. Indian Viewers are @66% and 34% are across the globe. Viewers across the globe are on rise.

- Grant of Rs.25, 05,000/- is utilized for establishing studio for creating e-contents.
- One faculty member is recipient of IUCEE outstanding Engineering Educator Award amongst 5 from all over India and 4 faculty members are recipient of IUCEE Faculty Fellow Award all over India for year 2016 and 2017.
- 29 faculty members of our institute are amongst top 253 nationwide recipients of SAP Fellowship Award and cash prize of Rs. 5000/- each as Top Performers in a four-week FDP on "Use of ICT in Education for Online and Blended Learning" conducted by IIT Bombay. Out of these, 23 faculty members have worked as Associate Faculty of IIT Bombay for FDP on Foundation Program in ICT for Education and Pedagogy for Online and Blended T-L Process. Every faculty mentored 40 faculty members across the nation and also received Rs. 12000/- each.
- Winners of Inspire-Infosys Campus-connect Award for Content Guru and Distinguished Facilitator Tracks during for three years.
- Activities were highly appreciated by gathering of the Fourth International Conference on Learning and Teaching in Computing and Engineering (LaTiCE 2016) at IIT Bombay and organizers have disseminated this success story to stakeholders for implementations as a role model.
- Substantial ET practices are emerging as some of the best practices after due iterations and total 52 number of research publications on ET
- Training on innovations is extended to conventional Arts, Science & commerce colleges in city. In all, 84 teachers from other institutions are trained.

- Improvement in students leaning & in turn result: Results of all the classes is above 95%
- Inculcation of self learning through e-contents amongst students

6. Problems Encountered and Resources Required

- Initially, majority of faculty members in our institute were novice and did not receive any formal training in education and pedagogy. In order to address this issue, training on ET was an essential factor.
- Mentoring for ET Research and training of ET practices to fresher was essential.
- Collaboration and peer assessment
- Regular follow-up & facilitation was required for the successful completion of activity

Resources required

- Infrastructure
 - i. Well-equipped classrooms/smart class room
 - ii. Recording rooms with good audio and video setup
 - iii. Client server environment
 - iv. Adequate Internet Facility
 - v. e-resources
- Human Resources
 - i. Expertise in education technology

7. Notes

Blended T-L is the need of the day. Especially in COVID-19 pandemic, all have been shifted to virtual/online platform, where effective T-L has become a challenging task. Such innovations will facilitate all the stakeholders in online/offline mode. Also, e-contents created by institute will be useful in Indian scenario where there is a paucity of good qualified faculty due to scaling up of engineering education.