An Innovative Teaching-Learning Technique Using WIT & WIL Approach

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Abstract*—Engineering Education plays a crucial role in shaping students into skilled employees thereby helping the society to grow in terms of technology. Engineers create infrastructure such as buildings, dams, bridges, highways, etc., Knowledge of all the subjects is possible only through effective classroom learning. In this aspect, teacher plays an important role. Teacher should make class interesting by following proper teaching learning pedagogies in the classroom. This is possible by the use of a few methods like WIT &WIL (Why am I teaching & What I am teaching, Why am I learning & What I am learning), POGIL (Process Oriented Guided Inquiry Learning), Course-based Projects & ICT tools like online whiteboards, online video conference software, smart boards, podcasts, virtual labs, etc., In the present paper, to explain the effectiveness of students involvement in the classroom and also to show the improvement in the academic performance, Foundation Engineering subject is taken as a reference study. With the implementation of WIT & WIL teaching pedagogy in classroom lecture, there is a lot of improvement observed in student performance in terms of core job placements, higher studies, pass percentage, and Student publications. After the academic year 2016-17, teaching learning pedagogies implementation in the classroom is made mandatory by our institute. There is more than 30% improvement in the student's performance in all the aspects discussed above. Even POGIL, Course-based project pedagogies make students to think creatively and also develop critical thinking skills thereby helping in lifelong learning.

***Keywords*— Course based projects; ICT tools; POGIL; Teaching Learning Pedagogies; WIT & WIL.**

ICTIEE* Track*: Pedagogy of Teaching and Learning
ICTIEE Sub-Track: Differentiated Instruction in Meeting the Needs of Every Student

I. INTRODUCTION

Education is a vital requirement of every human being and it is the source of our wisdom. It began with the emergence of the human race and will continue as long as people exist [Sharma et al. 2023]. "Education" refers to the powerful tool that allows us to obtain knowledge and improve our skills daily. It is widely recognized as the essence of every country's development and advancement. Prosperity and country-building are all possible when a nation or country has a strong, effective education method and policy.

A talented or educated citizen is known as an asset to any country. Nowadays people's assets are considered as the country's national assets and resources. An educated person can explore new ideas and this ideology helps in the development of the self as well as the whole country. Education has a great power to change the entire world. Providing students with the skills they need to live successful, meaningful lives is vital. In the modern world, this entails giving young people educational opportunities that foster their interests, curiosities, and creativity. It also improves critical thinking, problem-solving abilities and helps in lifelong learning [Shuman et al. 2002].

Education's stakeholders, notably governments, organizations, and students, all agree on its multidimensional importance. High-quality education, particularly tertiary education, is an essential component of family development throughout the income spectrum. To shape the world into a better place, engineering education plays a crucial role.

For generations, engineering has played an important role in human development and advancement. Imagine a world without roads, buildings, phones, computers, or even electricity; this is what a world without engineering. Engineering shapes the world by building infrastructure, advancing technology, and addressing difficult global concerns. Engineering study deals with the creation, maintenance, and application of machinery, engines, structures, etc. Civil Engineers create infrastructure such as bridges, dams, highways, and skyscrapers. Without them, modern society would simply not work. The world is constructed and designed by engineers. It's been argued that engineering is a method of thinking rather than merely a degree. It is a crucial and complicated component of education because it produces skilled workers whose decisions affect the safety of the general public in all spheres of society: from building infrastructure like roads and bridges to operating in an industrial setting like mining or electricity production to assessing natural disasters like landslides and tornadoes [Olds et al. 2005].

Engineering education is changing to meet the needs of students in the modern world [Brunhaver et al. 2017]. In today's scenario, the student's involvement in education is declining. Due to growth in technology and mental health concerns, it is getting harder and harder to engage and excite students in the classroom. Discovering fresh approaches to instruct engineering to a class of 20 or even 200 students is challenging,

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and the subject can appear unapproachable to students, particularly when lecturing is the main mode of communication [Rugarsia et al. 2000].

Adapting teaching methodologies by teachers to accommodate different learning styles and to meet the preferences of today's student's requirements [Woodcock et al. 2022]. To ensure that students learn effectively, teachers need to come up with innovative lesson plans and strategies. They ought to know how to create an engaging environment for every student in their class [Kapadia et al. 2008]. Learning effectiveness can be improved significantly by adapting small group learning or collaborating learning instead of individual learning. The results indicate that better performance can be seen after implementing the small group concept to the students. There is a scope for further research to investigate these methods and better document their instructional processes and outcomes to enhance pedagogical practices [Kalaian S et al. 2018]. Integration of Information Communication Technologies (ICT) in higher education in the Pacific, particularly at The University of the South Pacific (USP) highlights various smart learning tools, including REACT, mobile learning applications, Online Mathematics Diagnostic Tool (OMDT), and e-mentoring. Challenges include digital literacy gaps, infrastructure issues, and geographic isolation. These devices support a wide range of services and applications, which consistently promote student-centered learning, support student agency, and are deliberately developed to encourage social change. Recommendations emphasize the need for teacher training, collaboration, and investment in technology to enhance educational quality and accessibility in the region [Sharma, B. et al. 2018].

To educate students effectively and efficiently, engineering faculty members need to use teaching approaches, which are basic concepts pedagogies like WIT & WIL, POGIL, Think Pair Share, course-based projects, etc. These are selected based on several factors which include the topic areas, classroom statistics, and the teacher's educational ideas. For effective application of the above-mentioned pedagogies in the classroom, we need to take the help of ICT tools like a blackboard, Power Point, audio-visual aids, e-books, MOOCs, online video platforms, podcasts, virtual labs, polls, collaborative annotations, learning management systems, online journals and articles, online whiteboard, online video conference software, smart boards, etc in the teaching [Kanchana et al. 2024]. Various other pedagogies, like Problem-Based Learning (PBL), is to be implemented to enhance students' technical and transferable skills. There is a need to develop a curriculum comprising a set of PBL activities linking technical content and transferable skills. Key philosophies include interdisciplinary, authenticity, embedded skills, and promoting intrinsic motivation. Case studies illustrate the implementation of these philosophies through projects like "Engineering Challenges" and "How to Change the World [Mitchell, J et al. 2019]." A few teaching-learning methods that can be followed to deliver lectures in the classroom are shown in the Fig. 1 below.

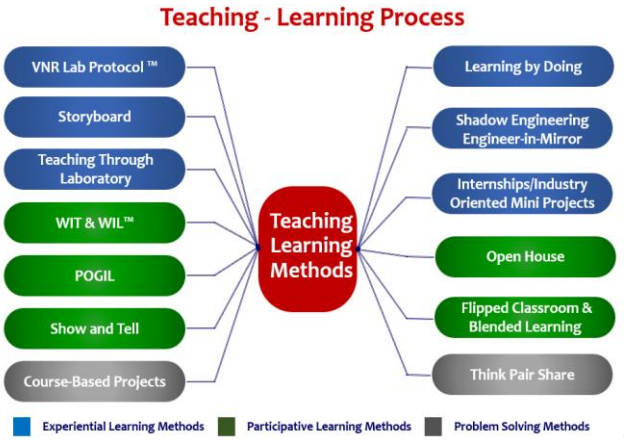

Fig. 1. Illustration of a few teaching-learning methods

Utilizing this wide range of teaching-learning methods in the classroom focuses on students' general growth which enhances their capacity for critical analysis and problem-solving skills. It encourages collaboration and supports the growth of decision-making skills [Sirigiri et al. 2015]. The purpose of writing this paper is to apply the teaching-learning pedagogies in the classroom effectively. To enhance classroom teaching, few of the following pedagogies are to be followed:

WIT & WIL: The "WIT & WIL" technique is an active teaching and learning approach incorporating the teacher's perspective on "Why am I teaching & What I am teaching." Additionally from a student's point of view, it is "Why am I Learning & What I am learning". Since learning happens through understanding rather than memorization, WIT & WIL offers a clear framework and measurable standards to ensure that the course objectives are fulfilled. Students become more proficient in organizing and processing information, which prepares them to build knowledge. Additionally, WIT and WIL formats offer an extensive number of opportunities for utilizing modern educational technologies and interactive teaching methods, including the use of slideshows, case studies, audio-visual materials, and storytelling with real-world examples.

To give a clear idea about what the WIT & WIL means is shown in below Fig. 2.

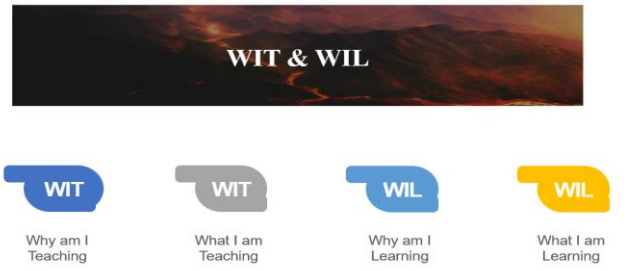

Fig. 2. Illustration of WIT & WIL for better understanding

POGIL: POGIL is abbreviated as "Process Oriented Guided Inquiry Learning". It is a student-centered instructional approach. In a typical POGIL classroom or laboratory, students work in small teams with the instructor acting as a facilitator. The POGIL technique has two broad goals: to promote subject mastery through student understanding, and to develop and strengthen key learning skills such as information processing,

communication, critical thinking, problem-solving, metacognition, and assessment. In POGIL activity, the teacher acts as a facilitator of learning rather than a provider of information. This activity leads students to build an understanding of the concepts that are discussed in the classroom [Begum et al. 2019]

Think-pair-share: Think-pair-share (TPS) is a teaching methodology in which students interact with each other to find answers or work through issues on a given problem. With this approach, students must meet the following requirements (1) Think towards a challenge or provide an answer on their own; and (2) Discuss their ideas with other students [Gumaelius et al. 2024].

Course-based projects: It is a student-centric teaching approach that promotes learning by bringing interesting, practical, and curriculum-related questions or tasks. Students work on a project for an extended period to solve a real-world problem or answer a hard question. The project must be demanding, open-ended, and interdisciplinary, requiring students to use their knowledge and skills from other subjects. Project-based learning can also help students learn valuable life skills like time management, organization, and goal planning. Students learn how to prioritize work, fulfill deadlines, and define attainable goals as part of the project planning and execution process. These abilities are useful not only in academic contexts but also in their future employment and personal life [TV et al. 2017]

Information and communication technologies (ICT) Tools: ICT tools allow teachers to develop unique ways of teaching skills that meet the particular requirements of each student, and improve retention of knowledge [Babu et al. 2024]

The use of appropriate ICT tools is necessary to design micro-lesson plan activities at various cognitive levels. A few years ago, the teaching faculty changed from traditional classroom teaching to proactive teaching using digital resources due to complex pandemic scenarios [Beena et al. 2022].

A variety of digital tools are available readily in the market. Several online journals, articles, online whiteboards, online video conference software, smart boards, podcasts, virtual labs, polls, learning management systems, and audio-visual aids are a few examples of digital tools. These ICT resources help educators deliver teaching and learning efficiently [Muntasher et al. 2016].

Research Gap: Online diagnostic tools can be created to address the problems in learning analytical subjects. The tool should evaluate the student's proficiency in the respective subject. Students who pass all the modules should be directed to the certification tool. Students who fail should be directed to remedial exercises. This will enhance their learning process efficiently.

II. METHODOLOGY

In this paper, an organized and systematic approach to the usage of a few teaching-learning pedagogies in the classroom to improve student academic performance is discussed. The main teaching-learning process adapted here is WIT & WIL [Kumari et al.,]. It is one such initiative that has been embedded into the teaching-learning process in our institute since 2017, as a part of the education process re-engineering. Some of the classroom activities adapted to teaching are discussed in the introduction part and the outcome is explained in the below sections.

Teaching Learning Experience with WIT & WIL: Teaching through WIT &WIL was implemented in the course Foundation Engineering in the VI semester of the Civil Engineering undergraduate program. In the class, there were 71 students with different capabilities, learning abilities, and understanding capacities. To bring interest in this subject and to seek attention towards the subject from all the students is a challenging task. This task can be achieved by teaching through WIT & WIL.

Foundation Engineering is a core subject that is designed to impart knowledge about the problems related to, different types of foundations and their adoption to site conditions, and analyze the stability of the soil-structures. Any Civil Engineering structure safety mainly depends on the strong foundation of the structure. There is a lot of potential for experiential learning in this course because the concepts are connected to real-world applications.

In the very beginning of the introduction to the course, foundation engineering syllabus delivery to the students, WIT & WIL application is made by taking a central scenario that connects the whole syllabus unit-wise with real-world examples. The explanation is made with the help of images and it is the practice that is followed in everyday class before starting a new topic. The scenario chosen to explain WIT & WIL is that which encompasses all the topics and subtopics of the syllabus represented with different images. The scenario is divided into different girds. The corresponding numbering is given to the grids. This numbering helps to identify the topic which is going to be taught in the class. The scenario taken here to introduce the syllabus of the subject is tilted as “Sikkim Pakyong Airport-A study on the Geotechnical Aspects”. This airport was taken as the central concept because, from the excavation work to the laying of the foundation, the procedure to be followed has interlinked with the syllabus of the subject. Linking the syllabus with the real-world application helps the students to understand the concept clearly. It also creates interest in learning and gives an idea about practical or field applications of the concepts and makes them industry-ready. All the topics in the syllabus are linked to the scenario thereby connected to the field applications. The general WIT & WIL methodology followed in our institute is shown in Fig. 3.

Fig. 3. Flow Chart of WIT & WIL Methodology [Kumari et al. 2016]

For the proof checking of the scenario, it was endorsed by the industry expert i.e., a civil engineer or a gusseted officer. A sample image of the scenario titled "Sikkim Pakyong Airport-A study on the Geotechnical Aspects" is shown in Fig. 4.

Fig. 4. Scenario of Foundation Engineering [Compiled from various sources]

Every day after the class, a WIT report is prepared based on the topics delivered in the class that are linked to the practical applications in the field. This activity is done daily after completion of the class and these reports are shared with the students on the next day of the class as a recap of topics discussed in the previous class. The template of the WIT daily report is shown in Fig. 5.

Daily report on WIT

Name of the Faculty:

Name of the Subject:

Class/Section: **Date:**

Sl.No.	Particulars	To be filled by the faculty
1.	Grid Reference No.	
2.	Scenario Reference: (Mapping with syllabus)	
3.	Topic covered in every class	
4.	**Description of scenario mapping and class content in and above 500 words:**	
5.	Relevant additional illustration/Information	
6.	Video links / Web links with reference to the description.	
7.	Signature of Repository by Coordinator of WIT & WIL	

Fig. 5. Template of WIT daily report

The whole class is divided into 12 groups & each group consists of 6 members. At the end of each unit, WIL reports are submitted by the student groups. For the effective preparation of the WIL reports, students are given with few journal papers and case studies that are related to that particular unit. For the effective practice of WIT & WIL in the class for all the subjects, an institute-level peer review team consisting of 3 senior faculty members visits the class 2 times each semester to review the students regarding WIT & WIL usage. The template of the WIL report is shown in Fig. 6.

Subject Name

What am I Learning, Why I am Learning (WIL)

Roll.No	Name	Unit Number

What did you learn from this unit

Was the application illustrated, clear for understanding the topics covered in this unit

Identify an application, to relate to the content learnt and explain

Fig. 6. Sample WIL report

WIT & WIL Implementation & Evaluation:

- Teachers delivered each lesson by clearly declaring their objectives: "Why am I teaching this topic?" Furthermore, "What should students achieve from it?"
- Similarly, students were asked to think about "why am I learning this topic?" and "what is its relevance in real-world applications?"
- Teachers in the Foundation Engineering course, for example, explicitly linked lecture topics like foundation types to real-world concerns like creating safe and secure buildings or bridges.
- Short, interactive Q&A sessions at the beginning and end of lectures emphasized these points.
- Student involvement was measured using attendance rates, in-class participation, and direct student response forms.
- Academic outcomes such as pass percentages, test scores, and grades were monitored before and after implementation.

The learning process is also enhanced by following a few teaching pedagogies like "POGIL, Think-Pair-Share, and course-based projects". For the evaluation of marks to the students two assignment tests are conducted. One of the assignments is evaluated through POGIL & Think-Pair-Share activities. To conduct these activities in the class, students are divided into batches consisting of 3 members. This is conducted similarly to the quiz. Through these activities, every student's participation is achieved. They will overcome stage fear, and the sharing of knowledge will also be achieved. One more assignment is evaluated based on course-based projects. At the end of the complete syllabus before the mid-term 2 examination, students were given with few projects related to the subject as an assignment. To evaluate the student's performance, the rubrics given in Table 1 below are followed for course-based projects.

TABLE I
ANALYTICAL RUBRIC USED FOR THE GROUP PERFORMANCE EVALUATION

Criteria	Excellent(5 marks)	Average (3 marks)	Poor (1 mark)
Objective & relevance	Projective objectives are and clear	Objectives are vague.	Objectives are not properly defined.

	relevant to the topic taken		
Project model	A nice working model	The model is ready but has some working issues	No Model
Results obtained and validation	Proper validation with genuine data	Validation is not done up to the mark.	Results are obtained but no validation was done
Report writing	A neat report with clarity of all the concepts, and proper editings.	A few images are not clear	The report is not clear.
Presentation	Proper presentation covering all the topics containing aim, methodology, results, and discussion. Proper explanation is required	The presentation is not up to the mark.	Poor presentation skills.
Viva	Should answer most of the questions during the presentation.	Able to answer only a few questions.	No clarity in the answers.

Using this rubrics, they get a clear idea of the practical applications of the subject in real life so that they will be able to understand, analyze & also resolve practical field problems. The core Industry expects engineers to have practical knowledge rather than theoretical knowledge, thereby providing job opportunities mainly in the field of Geotechnical Engineering.

POGIL Implementation & Evaluation:

- Students worked in small groups to answer carefully structured questions with Foundation Engineering problems.
- Rubrics were used to measure group performance in terms of teamwork, problem-solving abilities, and depth of understanding.

Course-Based Projects Implementation & Evaluation:

- Virtual labs were used to simulate stress analysis on various soil types.
- Smart boards and online whiteboards were used in classroom sessions to provide dynamic, and visual explanations of complicated engineering ideas.
- Student input on the usefulness of these tools was gathered through surveys.

III. Results & Discussions

The success of the WIT & WIL methodology in giving knowledge and interest to the students is based on the outcome of the students. After the academic year 2016-17 WIT & WIL method of teaching started practiced in classroom teaching. The following Table II consolidates the gradual changes in students' performance in the subject foundation engineering before and after methodology implementation i.e., during 2016-17 and after 2017-18 up to 2023-24 by taking into consideration of few parameters as the measure:

TABLE II
Performance of the students before & after implementation of the WIT & WIL

S. No	Particulars	Before the Implementation of WIT& WIL	After the implementation of WIT&WIL						
		During Academic Year (AY): 2016-17	During AY: 2017-18	During AY: 2018-19	During AY: 2019-20	During AY: 2020-21	During AY: 2021-22	During AY: 2022-23	During AY: 2023-24
1.	The overall attendance percentage of the students Referring to the syllabus, online Videos, lecture content	65%	70 %	75 %	80 %	83 %	85 %	87 %	90 %
2	Pass percentage in MID, End Examinations	45%	50 %	60 %	65 %	80 %	85 %	88 %	90 %
3	Student Publications	65%	69 % %	71 %	75 %	79 %	82 %	85 %	88 %
4	Core Job Placements as Geotechnical Engineers	5%	8%	11 %	15 %	25 %	30 %	35 %	40 %
5	Higher Studies (M.Tech, M.S)	1%	3%	4%	5%	6%	7%	8%	10 %
6	NPTEL Certifications	10%	12 %	15 %	20 %	25 %	30 %	35 %	40 %
7		15%	18 %	20 %	23 %	35 %	43 %	53 %	60 %

A comparison of students' performance in aspects like attendance, pass percentage, placements, etc. from AY 2016-17 up to 2023-24 is shown in Fig. 7 to 13.

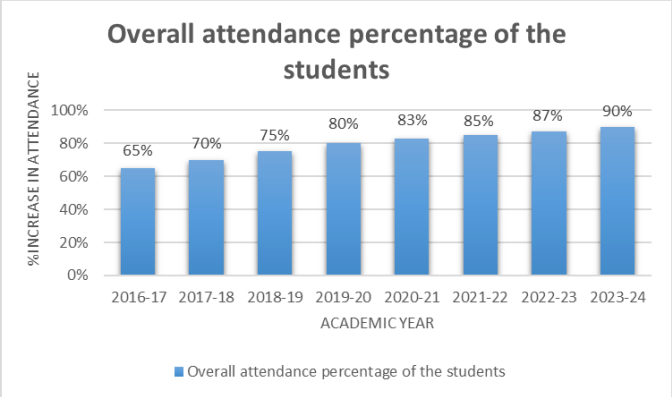

Fig. 7. Comparison of attendance percentage from AY: 2016-17 to 2023-24

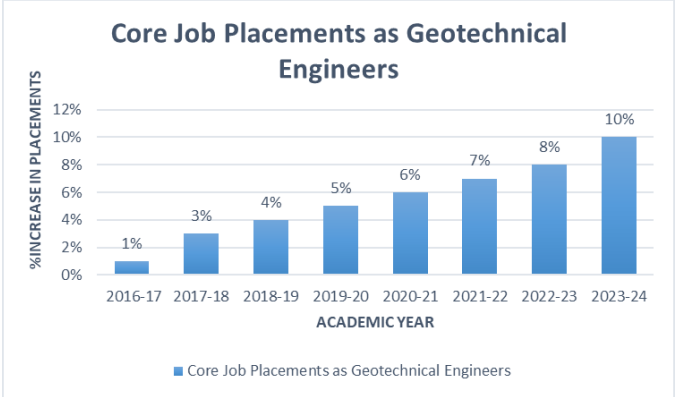

Fig. 11. Comparison of core job placements from AY: 2016-17 to 2023-24

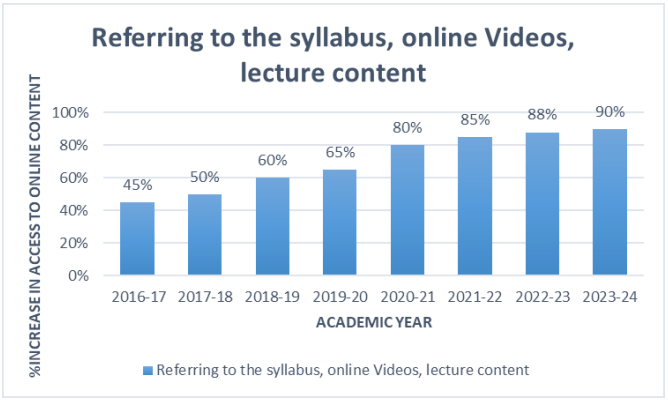

Fig. 8. Comparison of Referring to the syllabus from AY: 2016-17 to 2023-24

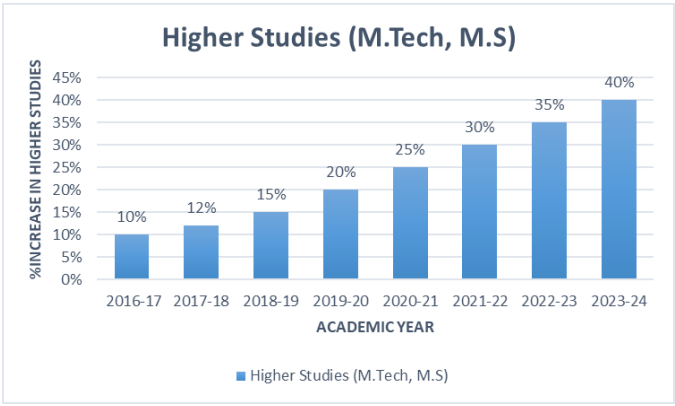

Fig. 12. Comparison of higher stuides from AY: 2016-17 to 2023-24

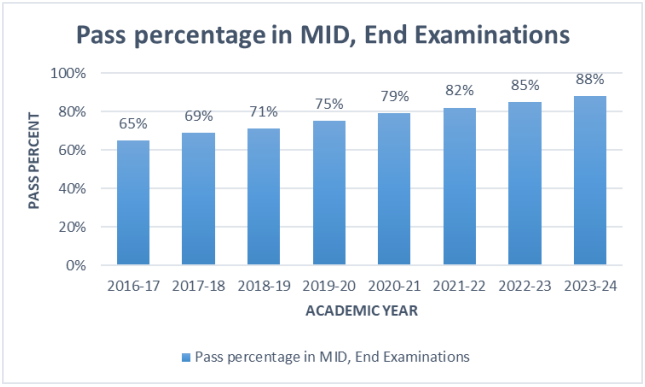

Fig. 9. Comparison of pass percentage from AY: 2016-17 to 2023-24

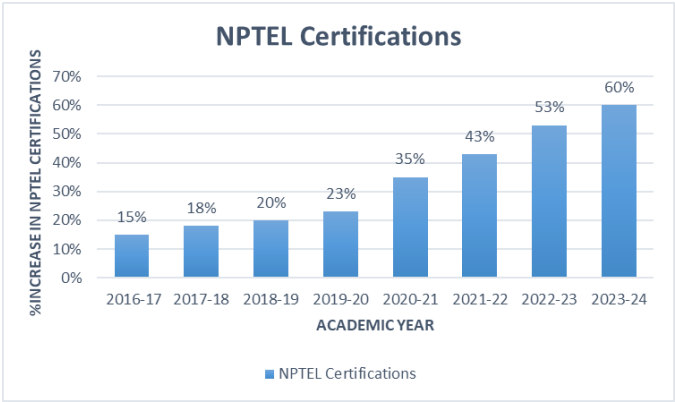

Fig. 13. Comparison of NPTEL Certifications from AY: 2016-17 to 2023-24

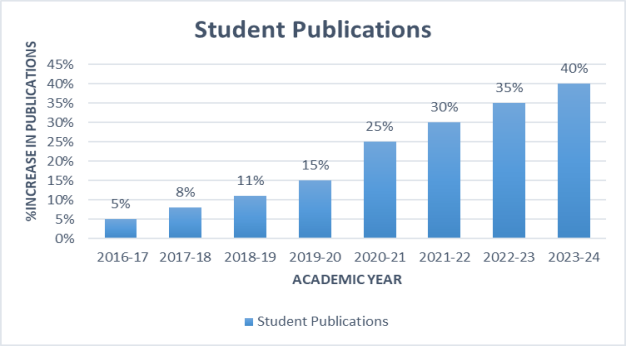

Fig. 10. Comparison of student publications from AY: 2016-17 to 2023-24

To show the performance of students in all aspects like attendance, pass percent, publications, core jobs, and higher studies result analysis of the latest academic year 2023-24 is shown in the below Fig. 14.

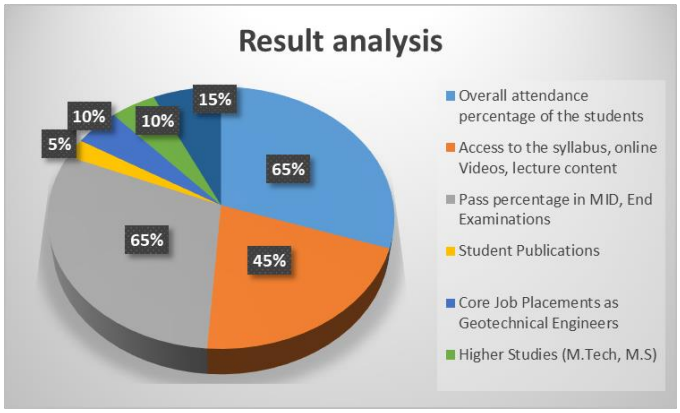

Fig. 14. Result analysis of Foundation Engineering subject for the AY:2023-24

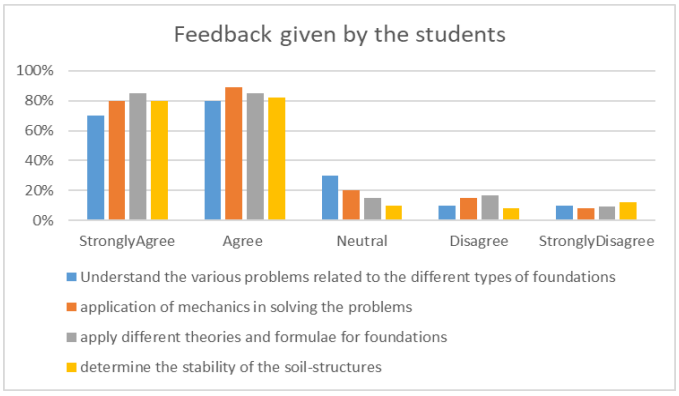

Fig. 15. Students' feedback during AY: 2023-24 for Foundation Engineering Subject

Feedback: Feedback is extremely important in improving student learning experiences. This has a huge effect on transforming teaching at the higher education level. Feedback is crucial to the learning process, both from teachers to students and from students to teachers. From the teacher's point of view, offering timely and constructive feedback enables them to discover areas where students are struggling. This allows teachers to modify their instructional strategies, provide targeted help, and appropriately challenge students. Feedback enables teachers to assess the efficacy of their teaching approaches and make data-driven decisions that improve student results [Finelli et al. 2019]

The Following Table III is the template of the feedback form of the foundation engineering subject which is circulated to students to give feedback to the faculty regarding the subject understanding.

TABLE III
FEEDBACK FORM TEMPLATE

StronglyDisagree/ Poor	Disagree somewhat/ Fair	Neutral/ Good	Agree somewhat/ Very good	StronglyAgree/ Excellent
(1)	(2)	(3)	(4)	(5)

S. No.	Indicators	Outcome	Rating
1.	Are you able to Understand the various problems related to the different types of foundations and their adoption to site conditions?	**CO-1**	
2.	Are you able to correlate the mechanics of soil and apply them in solving the problems related to foundation engineering	**CO-2**	
3.	Are you able to analyze & apply different theories and formulae for	**CO-3**	
4.	Are you able to determine the stability of the soil-structures	**CO-4**	

The Feedback given by the 130 students regarding the course outcomes achieved in the Foundation Engineering subject by using WIT & WIL & Course-based projects pedagogies in the classroom during AY 2023-24 is shown in below Fig. 15.

Despite the positive outcomes observed, certain limitations need to be acknowledged. Several challenges emerged during the implementation of these pedagogies. Student feedback played a crucial role in evaluating the success of these methods and identifying areas for improvement:

- The pedagogies were especially applied to the Foundation Engineering course at a single institution. This limits the applicability of the findings to other engineering courses or universities with differing student demographics, resource availability, or teaching styles.
- Virtual labs, smart boards, and podcasts demand major institutional investment in infrastructure and training. Limited access to these technologies, particularly in resource-constrained contexts, can impede the wider use of these methodologies.
- POGIL demands small, well-facilitated group work, which presents logistical problems such as ensuring good group dynamics and preventing domination or lack of engagement by particular students.
- Preparing teachers to move from lecturers to facilitators. Designing well-structured problems that correspond to course objectives.
- Active learning methods, such as POGIL, and course-based projects frequently required more time than typical lectures. This occasionally reduced the breadth of topics covered in the allowed course hours.
- Students esteemed the clarity gained by connecting ideas to real-world applications. They felt more motivated and purposeful when the content's relevance was highlighted.
- Many students indicated that group activities and projects helped them improve their critical thinking, teamwork, and problem-solving abilities.
- Course-based projects, in particular, were recognized as the most engaging feature of the approach since they enabled students to apply theoretical knowledge in real-world scenarios.

Innovative Applications:

Integration of Emerging Technologies in Pedagogy like AI Driven Tools, Virtual Reality (VR), and use of Digital Twins, etc..,

- Use AI tools, such as chatbots or virtual assistants, to create individualized learning experiences. For example, an artificial intelligence system might replicate soil properties and assist students in designing a foundation in a virtual environment, providing feedback on their choices.

- Introduce VR-based simulations that allow students to virtually explore construction sites or examine soil layers beneath a building in 3D. For example, a virtual reality module may enable students to "walk through" a virtual building project, spotting potential foundation design issues and providing solutions in real-time.
- Digital twins could be used to simulate physical systems (for example, a building's foundations) in a virtual environment, allowing students to test their designs under various conditions without risking their safety. For example, a digital twin of a bridge foundation might enable students to replicate stress tests, erosion, and seismic impacts.
- Move beyond traditional heutagogy by embracing current concepts such as connectivism and constructionism.
- Connectivism: Use internet networks, forums, and collaborative platforms to enable students to learn from their classmates, industry professionals, and the global community. For example, students could take part in worldwide engineering hackathons or work on a virtual project with peers from other institutions.
- Constructionism emphasizes project-based learning, in which students "learn by making." For example, introduce a capstone project in which students create a physical foundation prototype with new materials and submit it to a panel of industry experts.
- These applications and examples go beyond typical frameworks, relying on technology, multidisciplinary approaches, and real-world applicability to make the teaching unique and effective.
- By bringing novel, context-specific applications, the study adds new ideas to engineering education and demonstrates how these methods might handle 21st-century concerns.

CONCLUSIONS

The WIT & WIL approach to teaching-learning methodology was adapted in the classroom to give students a clear picture of the real-world applications. It enhances the student's understanding capabilities of the subject in terms of practical knowledge thereby making them industry-ready.

Through the following goals, the aforementioned program can give students a profile that is ready for employment.

- To expose the student as a potential employee based on their academic achievements, such as high attendance rate or aggregate percentage.
- Inspire students to become passionate about the subject specializations they have chosen right from the first year.
- Assign them to work on real-time projects utilizing modern technologies in fully furnished labs adhering to specific norms.
- Build an environment that encourages proactive questioning, effective presentation skills, and a wide range of industry exposure.
- Students took NPTEL certification courses and got topper & ELLITE certificates in the course foundation engineering.
- Few Students have done major projects during their IV year in the field of geotechnical engineering and two batches were awarded the best project award in our college.
- Course-based projects helped the students to publish conference and journal papers in reputed journals like Disaster Advances, Material Today proceedings, etc which are Scopus-indexed publications.

To provide the best possible results for students, it is necessary that institutions of any standard, whether they are affiliated colleges or autonomous status institutions, need to implement certain teaching methodologies in the classroom.

The students worked very hard to translate the ideas into functional models that were relevant to the real-world situation. The expertise and the level of critical thinking that went into conceptualizing the idea were both demonstrated by the model display. Additionally, it was evident from the peer evaluation and student responses, that every student thoroughly loved the process and participated in it, which would not have been possible in a conventional classroom environment.

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