

# Purpose-Driven Learning in the Age of AI: Implementing WIT & WIL™ in Engineering Classrooms

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## Abstract

Engineering education today needs learning experiences that are meaningful, experiential, and connected to what industries are expecting. This paper describes how an AI-supported version of the WIT & WIL™ framework (Why am I Teaching/What am I Teaching and Why am I Learning/What am I Learning) can make teaching and learning more intentional in undergraduate engineering classes. AI tools helped teachers align their courses with industry skills and create useful reflective prompts aligned with real-world scenarios. Students used AI-based diagnostic tools and short learning suggestions to improve their understanding and reflect better on what they were learning. When implemented in first-year courses, this approach improved student engagement, clarity of concepts, and purposeful teaching. The paper also addresses ethical and scaling challenges, transparent AI usage, and phased institutional support. Overall, the study shows that combining AI with reflective teaching practices can create a more personalized, meaningful, purpose-driven and NEP-aligned learning experience in engineering education.

*Keywords-Reflective Learning, AI in Higher Education; Engineering Education, WIT & WIL™, Outcome-Based Education, Personalized Learning, NEP 2020.*

## 1. Introduction

The WIT & WIL™ (Why am I Teaching, What I am Teaching / Why am I Learning, What I am Learning) initiative is a transformative pedagogical strategy designed to enhance purpose-driven learning and teaching pedagogy among engineering educators and students. It encourages faculty to consciously reflect on the "Why" behind every topic they teach (WIT) and motivates students to introspect on the "Why" of what they are learning (WIL). This initiative bridges the gap between curriculum delivery and learner engagement by aligning learning objectives with real-world applications and student aspirations. It integrates reflective questioning, outcome-based education (OBE), and constructive alignment principles, ensuring that both educators and students are active stakeholders in the teaching-learning process. By anchoring academic content to contextual relevance and professional competencies, WIT & WIL™ fosters deeper learning,

engagement, and ownership. Engineering students benefit from increased clarity, motivation, and connection to industry practices, while faculty enhance the relevance and impact of their teaching. This best practice is particularly effective in first-year foundational courses, aligning seamlessly with NEP 2020 (Ashokkumar et al., 2025) and AICTE's vision for outcome-focused, learner-centric education. AI acts as a catalyst in transforming WIT & WIL into a strategic, scalable practice in engineering education by playing an active role in strengthening the reflective learning cycle driving towards outcome-based education (Pratima et al., 2023).

## 2. Background and Rationale

Reflective pedagogies, which are rooted in constructivism, experiential learning, and metacognition, enhance learner engagement and deepen understanding. However, traditional reflective practices are time-intensive, subjective, and difficult to scale. It is here where AI provides the opportunity to enhance both the intent and the execution of reflective pedagogy (Rolf et al., 2018, Nirvikar et al., 2024), making WIT & WIL™ more structured, evidence-based, and scalable by:

- analysing curriculum–outcome alignment,
- identifying learning gaps,
- generating tailored prompts,
- recommending micro-learning resources,
- evaluating reflection depth, and
- providing actionable dashboards for faculty.

## 3. Methodology / Implementation Framework

### 3.1 Orientation and Sensitization

Faculty development programs introduced reflective teaching and hands-on training in AI tools, including curriculum-mapping assistants, diagnostic assessment engines, and AI-driven prompt generators to be implemented in creating WIT scenarios. Students were sensitized on how AI-enabled systems would support their WIL reflections.

### 3.2 AI-Assisted Lesson Planning (WIT)

Using AI planning platforms, faculty:

- analysed topic relevance,
- mapped content to course outcomes,
- identified industry applications,
- and generated WIT prompts based on Bloom's taxonomy and domain skills.

These aspects ensured intentional and context-rich teaching for better relevance and understanding. The template documents of WIT & WIL are represented in Figure 1.

### 3.3 Student Reflection and AI-Enabled Personalization (WIL)

Students created WIL Reflection Journals supported by AI tools that:

- diagnosed prior knowledge gaps,
- recommended micro-learning resources,
- provided real-time feedback on writing clarity and conceptual depth,
- suggested industry-relevant examples for application.

This process led to an automatic understanding of the level of engagement of the students, reflection of themes and their clarity towards conceptual knowledge.

**Report on WIT**

**Why am I Teaching What I am Teaching**

Name of the Faculty: \_\_\_\_\_ Name of the Theory Course: \_\_\_\_\_

Class/Section: \_\_\_\_\_ Academic year/Semester: \_\_\_\_\_

Sl. No.	Particulars	To be filled by the Faculty
1.	Scenario Title: (Mapping with syllabus)	
2.	Name of the Industry endorsed:	
3.	Name & Designation of the Expert (who endorsed the scenario):	
4.	Percentage of syllabus covered through WIT Scenario:	
5.	<b>Description of scenario mapping and course content above 500 words:</b>	
5.	Relevant additional illustration/Information (No. of illustrations with titles)	
6.	Video links / Web links with reference to the description.	
7.	No. of WIL Reports collected (Minimum of 12 reports; Batch size: 5 students per batch)	
8.	Signature of Repository by Coordinator of CET of the Department & HoD	
9.	Signatures of the Auditing team	

Enclosures: Industry Endorsed WIT & WIL scenario

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**Report on WIL**

**Why am I Learning, What I am Learning**

B.Tech. xx Year xx Semester – Department and Section Academic Year:

Subject Name: \_\_\_\_\_

Roll.No.	Name	Course

What did you learn from this course?  
(Note: This should not reflect the syllabus of the units)

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Was the application illustrated, clear for understanding the topics covered in this course.  
(Explain in few words)

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

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Clarifications/Suggestions (if any):

Figure 1 Sample templates of WIT & WIL

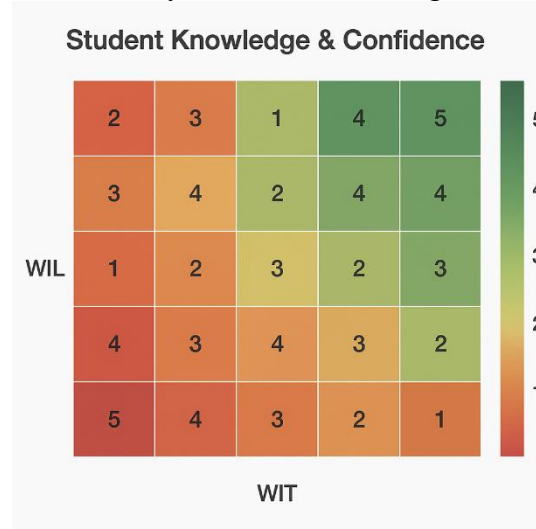
### 3.4 Classroom Integration

WIT prompts were introduced at the starting of each unit by the faculty, followed by collaborative WIL journaling by the students in teams of 4 to 5 members. AI dashboards helped

faculty identify struggling learners and adapt instruction accordingly and further digital tools like Google Forms, Google Classroom, and Padlet, supported submission and peer interaction.

### 3.5 Assessment and Feedback

Reflective questions were integrated into formative assessments. AI analytics generated heatmap (Fig 2) and topic-wise difficulty indicators, enabling evidence-based teaching decisions.



**Figure 2 Heat map of student knowledge & confidence on WIT & WIL**

The heat map visually represents students' responses on the WIT & WIL™ framework. Each cell in the grid corresponds to combined student ratings on these dimensions using a 1–5 scale, where 1 indicates very low clarity or confidence and 5 indicates high clarity, relevance, and perceived value.

The colour gradient ranges from red (low) to green (high), enabling quick interpretation of areas where students feel confident and those where they require additional support. Warmer colours (reds and oranges) indicate zones where students may lack clarity about the purpose or importance of learning activities, suggesting misalignment between teaching intentions and student perceptions. Cooler colours (greens) highlight areas where students demonstrate better understanding, engagement, and alignment with course outcomes.

In this sample heat map, the distribution shows mixed levels of WIT and WIL, with several mid-range scores (2–3) indicating moderate understanding but also revealing opportunities for improvement in reflective learning and curriculum alignment. Higher ratings in certain cells show that some concepts resonate well with students, validating effective teaching practices. Conversely, lower-rated pockets signal areas where educators may need to strengthen explanations, contextual relevance, or learning activities.

Overall, the heat map serves as a diagnostic tool that helps instructors quickly identify patterns of student clarity, motivation, and perceived value, enabling targeted instructional interventions. It also supports students in reflecting on their own learning journey, encouraging deeper engagement with the WIT & WIL™ framework.

## 4. Results and Outcomes

### 4.1 Enhanced Learner Engagement

More than 85% of students reported improved understanding of topic relevance. AI-personalized micro-resources increased motivation and classroom participation (Muh et al., 2024).

#### **4.2 Improved Conceptual Understanding**

Students who engaged with AI-recommended resources demonstrated better performance in unit tests and deeper conceptual articulation in WIL reflections.

#### **4.3 Strengthened Faculty Intentionality**

AI-generated mapping and insights helped faculty refine their teaching plans, improve pacing, and design more effective reflective prompts in generating the scenarios.

#### **4.4 Data-Informed Teaching Decisions**

AI dashboards allowed faculty to identify common misconceptions, slow-learning areas, and the effectiveness of instructional strategies.

#### **4.5 Career Clarity and Skill Awareness**

Students connected course topics to real-world engineering roles, improving elective choices, project selection, and professional identity formation.

### **5. Discussion**

The integration of AI moved WIT & WIL™ from a reflective teaching strategy to a dynamic, data-informed ecosystem. AI addressed major challenges in reflective pedagogy like scalability, consistency, and personalization. Importantly, the approach maintained ethical integrity through transparency, minimal data collection, and faculty oversight over AI suggestions by embedding AI into specific processes: curriculum mapping, personalized feedback, analytics, and automated prompt generation.

#### **5.1. Lessons Learned**

- **Clarity and guidance are essential:** Students initially struggled with reflective writing. Guided prompts, AI-generated scaffolds and exemplars helped improve quality.
- **Time management:** WIL reflections required space in tutorials or flipped sessions.
- **Faculty training matters:** Continuous mentoring and showcasing success stories ensured faculty confidence in AI-supported pedagogy.
- **Scalability needs infrastructure:** Automation and institutional IT support are essential for multi-course implementation.
- **Customization Required:** Discipline-specific examples interpreted by AI outputs were crucial to make the WIT-WIL more relatable and a one-size-fits-all approach was not effective.

### **6. Conclusion & Recommendations**

WIT & WIL fosters a culture of intentional and meaningful education in engineering classrooms. By cultivating clarity of purpose in both teaching and learning, this practice empowers students to become lifelong learners and thoughtful professionals and helps faculty deliver content with renewed relevance and enthusiasm. With iterative improvements and institutional support, it holds potential to transform engineering education toward a more reflective, industry-aligned, and purpose-driven model( La Sunra et al., 2024).

The AI-enabled WIT & WIL™ framework offers a reflective, evidence-based, and scalable model for engineering education. By combining AI-driven personalization with purpose-driven teaching, institutions can significantly enhance learner engagement, conceptual clarity, and career relevance. The approach aligns strongly with NEP 2020, outcome-based education principles, and the future of AI-supported higher education. With institutional support and ethical safeguards, WIT & WIL™ can transform foundational engineering courses into purposeful, learner-centric experiences that prepare students for a rapidly evolving technological world. AI tools can identify prior knowledge gaps and suggest personalized resources, setting the stage for meaningful WIL reflections. AI detects what students lack, delivers just-in-time learning, and creates a stronger foundation for students to engage in deeper, personalized WIL reflections.

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### Author Bio

Dr. Jyotsna Cherukuri, Professor of Chemistry at VNR VJIET, Hyderabad, brings nearly three decades of experience to her role. Teaching is her passion, and she actively explores innovative approaches to create skill-based and sustainable learning environments. Her research interests include technology-enhanced teaching and learning, curriculum design and delivery, assessment methods, and environmental projects with societal impact. Her expertise is on topics such as instructional design & delivery systems, WIT & WIL, and modern teaching pedagogies.

Dr. Kanchana Sundaram is a passionate English teacher with over two decades of experience, dedicated to equipping engineering students with essential communication and soft skills. Holding a Ph.D. in English Literature, her expertise spans from language teaching to integrating educational technology. She further contributes as a coordinator for Education Technology, mentoring faculty in innovative pedagogies. She believes deeply in the transformative power of education and actively connects with fellow educators and researchers.

Dr. Prativa Rani Saha, Assistant Professor of English at VNR VJIET, Hyderabad, holds a Ph.D. in ELT and specializes in literature, soft skills, and educational technology. She actively contributes to research, faculty development, and pedagogical innovation, promoting learner-centric methodologies and digital tools to enhance teaching and learning in higher education. Dr. Saha is a dynamic professional who has organized and conducted various programs to empower faculty in adopting innovative pedagogies like online teaching tools, active teaching-learning methodologies, blended learning, and flipped classrooms.

## References

- T. Ashokkumar , T. Russel Raj, A. Rajadurai , A.H. Abishini, A.H. Anchani (2025). Analysing the impact of the new educational policy 2020: A comprehensive review of India's educational reforms. *Evaluation and Program Planning*, Volume 108. <https://doi.org/10.1016/j.evalprogplan.2024.102515>.
- Rolf Reber, Elizabeth A Canning, Judith M Harackiewicz (2018). Personalized Education to Increase Interest. *Curr Dir Psychol Sci.* ;27(6):449–454. <https://doi.org/10.1177/0963721418793140>.
- Nirvikar Katiyar, Vimal Kumar Awasthi, Ram Pratap, Kuldeep Mishra (2024). Ai-Driven Personalized Learning Systems: Enhancing Educational Effectiveness. *Educational Administration Theory and Practice journal* 30(5) <https://doi.org/10.53555/kuey.v30i5.4961>.
- Pratima Jain, Deepak Shrivastava, I. J. (2023). Outcome-Based Education: A Learner-Centric Approach. *European Economic Letters (EEL)*, 13(5), 920–925. Retrieved from <https://eelet.org.uk/index.php/journal/article/view/852>.
- Muh. Nur Alamsyah, Moch. Syihabudin Nuha, Muslihati, Zamroni (2024). Learning Engagement; Definition, Aspects, Measurement and Intervention Strategies. *KONSELING Jurnal Ilmiah Penelitian dan Penerapannya* 6(1):2686-2875, <https://doi.org/10.31960/konseling.v6i1.2364>.
- La Sunra, Nue Aeni & Fauzan Hari Suddling Sally (2024). A Comprehensive Exploration of Outcome-Based Education Principles and Practices, *Asian journal of education and social studies* <https://doi.org/10.9734/AJESS/2024/V50I11234>.
- Krishna, V. R., Krishna, B. M., & Raghunadh, P. V. S. G. (2025). An Innovative Teaching-Learning Technique Using WIT & WIL Approach. *Journal of Engineering Education Transformations*, 38(2), 471–479. <https://doi.org/10.16920/jeet/2025/v38is2/25058>.