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Journal for Research Scholars and Professionals of English Language Teaching

ISSN: 2456-8104 Impact Factor: 6.895 (SJIF)
Vol. 10 | Issue 53 | January 2026 www.jrspelt.com

Evaluating Innovative Pedagogical Approaches for Higher-Order Learning Outcomes in Communication Skills Course

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 Crossref/DOI: https://doi.org/10.54850/jrspelt.10.53.002

Abstract: *Developing effective communication skills is a critical requirement for engineering graduates, yet traditional lecture-based teaching often falls short in developing the higher-order competencies demanded in professional contexts. This study investigates the effectiveness of innovative, activity-based teaching practices in enhancing undergraduate engineering students' communication skills. A survey-based research design was employed with 100 participants, semester-II engineering students learning communication skills as a compulsory course. The multiple instructional strategies, including debates, role plays, flipped classroom sessions, video resume preparation, e-portfolio creation, case studies, and poster making were integrated over a semester. Data were collected using a structured, validated questionnaire and analyzed using descriptive and inferential statistics, supplemented by qualitative categorization of student responses through Bloom's Taxonomy. Results indicated that interactive methods such as group discussions, debates, role plays, and flipped classrooms significantly enhanced engagement, confidence, and critical thinking, while digital tasks like e-portfolios and video resumes strengthened professional readiness. Bloom's Taxonomy analysis revealed that the learning approaches facilitated movement beyond lower-order cognitive processes to application, analysis, evaluation, and creation, with substantial inter-rater reliability. Grounded in constructivist learning theory and Kolb's Experiential Learning Cycle, the study provides empirical support for the integration of experiential and student-centered approaches in engineering education. The findings highlight the potential of a multi-strategy pedagogy to cultivate communication competence, offering valuable implications for curriculum designers and educators seeking to align with competency-based frameworks.*

Keywords: Bloom's Taxonomy, Communication Skills, Higher Order Learning, Teaching Methodologies

Article History: **Received: 03 Jan- 2026;** **Accepted: 12 Jan-2026;** **Published/Available Online: 30 Jan- 2026**

1. Introduction

Globalization has made communication skills a vital necessity. The field of education has changed rapidly due to the growth in technology. The traditional teaching method has been transformed with the help of technology. This further adds new prospects to advance teaching-learning experience. This becomes evident while teaching communication skills to an engineering course. The engineering sector has gradually joined the international academic and professional networks. The need to develop communication skills to enhance employability, research and international collaboration has grown in the past years. Traditional teaching methods may not be sufficient to equip learners with the required communicative competence essential for the specific field. The present paper highlights the need to design the curriculum for communication skills that will incorporate the needs of the present era.

The present article studied various innovative methodologies for learning communication skills, including the flipped classroom, poster making, survey-based mini project, role plays, group discussion, debate, video resume, e-portfolio, case studies, elevator pitch, and poster making. The practice of innovative methodologies offers many advantages, like improved class involvement, access to various resources, and enhanced confidence. It provides them with an active and collaborative learning environment. The pedagogical strategies that align with the subject have been selected. Different methods have been integrated to create an engaging learning experience. The use of experiential and inquiry-based pedagogy enabled students to use theoretical knowledge in real-world situations through different activities and find solutions through research, teamwork and critical thinking.

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Aims:

- Analyze the role of different teaching methodologies in enhancing communication skills
- To explore the range of different methodologies available to teach communication skills.
- To examine the effectiveness of these methodologies in teaching communication skills.
- To observe pedagogical strategies and best practices for integrating new methodologies.
- To assess observations and experiences of students and instructors in using these methodologies.
- To utilize Bloom's Taxonomy as a structured evaluative framework for assessing the effectiveness of innovative teaching methodologies in promoting higher-order cognitive skills in a communication skills course.

With these research objectives, the study aims to contribute valuable understandings and recommendations to the field of English language communication by incorporating different teaching methodologies for engineering students. Effective communication in English is essential for teamwork, research and career advancement. Technology has made several innovative teaching methodologies available to improve teaching and learning experience. These methodologies can be incorporated into education to help holistic development. These methodologies will provide an engaging learning environment that will address different learning styles. The study proposes a few recommendations that will help in curriculum development and certain pedagogical methods to improve communication skills.

A wide range of teaching-learning methodologies were developed for the study, like flipped classroom, poster making, survey-based mini project, role plays, group discussion, debate, video resume, e-portfolio, case studies, elevator pitch, and poster making. NEP 2020 aims at improving learning, assessment and planning along with fixing existing challenges and undertaking action research to improve the quality of learning. It also suggests moving away from the traditional high-stakes examination system to a multidimensional, competency-based evaluation that will measure critical thinking and real understanding.

2. Methodology

Research Design: The present study employed a quantitative, descriptive survey-based research design to evaluate 100 students' perceptions of the effectiveness of various innovative teaching methodologies in enhancing their communication skills by qualitative categorization of responses through Bloom's taxonomy. The design was chosen to systematically examine students' perceptions of innovative teaching methodologies and to evaluate the extent to which these interventions contributed to the development of communication skills.

The target population comprised a total of 100 first year engineering, semester II students, in the year 2025 who had undergone classroom instruction integrated with a range of experiential and activity-based strategies. The subject related to communication skills is compulsory for semester II.

Demographic Profile: Age range-18-19 years, semester of study II (January-May 2025).

Male- 68%, Female-32%

Learning Approaches: Students were exposed to a series of experiential and activity-based methodologies integrated into the Communication Skills curriculum. These included: group discussion/debate, flipped classroom sessions, survey-based mini-projects, video resume preparation, e-portfolio creation, case studies, role plays, elevator pitches, and poster making. Each method was implemented as part of the Communication Skills curriculum to promote active learning, critical thinking, collaboration, and real-world application of concepts.

Research Tool: Data was collected through a structured questionnaire having24 items measured on a 5-point scale (1 = strongly disagree to 5 = strongly agree), developed to understand students' feedback on parameters such as engagement, skill development, clarity of concepts, and overall learning experience. Responses were

analyzed through quantitative analysis of perceptions. This methodological approach enabled the researchers to systematically examine the impact of the adopted teaching practices on students' preparedness for academic and professional communication contexts. The research was reviewed by a panel of three subject experts to establish content validity.

The study received ethical approval from Vidyalankar Institute of Technology, Mumbai, where the data were collected. Participants were informed about the research and confidentiality of their responses was assured.

The learning approaches were implemented over a period of a semester, January to May 2025, and at the end of the semester, the questionnaires through Microsoft forms as well as paper forms were shared with them. In total, 100 responses were received.

Data Analysis: Data were compiled into two tables: (i) percentage of skills covered through each activity, and (ii) distribution of learning outcomes across Bloom's taxonomy levels. Each response was analyzed for key indicators corresponding to Bloom's taxonomy (1956) cognitive skill levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating. It helped to map perceived learning outcomes to cognitive skills levels. Students' responses were recorded in terms of the percentage of skills developed through each activity, while cognitive learning outcomes were mapped against Bloom's Taxonomy (Remember, Understand, Apply, Analyze, Evaluate, Create).

These data were analyzed using descriptive statistics (percentages and graphical representation) to highlight overall trends. To determine whether the differences across activities and learning levels were statistically significant, Chi-square Goodness of Fit tests were performed.

The analysis was carried out with a fixed sample size of n = 100, allowing direct conversion of percentages into frequencies. For Bloom's taxonomy, the expected distribution was uniform across six levels, whereas for teaching activities, it was uniform across nine categories. The chi-square values, degrees of freedom, and p-values were calculated to test for significance at the 0.05 level.

This methodological approach ensured both descriptive and inferential insights: descriptive analysis provided an overview of the distribution of student responses, while inferential statistics tested the significance of observed differences.

Hypothesis Formulation

For the analysis of teaching activities and the percentage of skills covered, the following hypotheses were tested using the Chi-square Goodness of Fit test:

Null Hypothesis (H_0): The effectiveness of all teaching activities (in terms of percentage of skills covered) is equal, i.e., there is no significant difference among the activities.

Alternative Hypothesis (H_1): The effectiveness of teaching activities (in terms of percentage of skills covered) is not equal, i.e., some activities are significantly more effective than others.

For the analysis of Bloom's Taxonomy levels, the following hypotheses were tested using the Chi-square Goodness of Fit test:

Null Hypothesis (H_0): Students' learning outcomes are equally distributed across all six levels of Bloom's Taxonomy, i.e., there is no significant difference in the representation of cognitive levels.

Alternative Hypothesis (H_1): Students' learning outcomes are not equally distributed across Bloom's Taxonomy levels, i.e., some levels are significantly more represented than others.

Theoretical Framework

The methodological approach of this study was grounded in established and contemporary learning theories that underline active engagement and skill development. Bloom's Taxonomy provided the framework for classifying

student learning outcomes across cognitive domains, ranging from lower-order processes such as remembering and understanding to higher-order skills like analyzing, evaluating, and creating (Anderson & Krathwohl, 2001; Su & Cheng, 2019). To ensure that students engaged in meaningful practice beyond rote learning, the study also drew upon Kolb's Experiential Learning Cycle, which highlights learning as a cyclical process involving concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984; Kolb & Kolb, 2017). Additionally, the study was informed by constructivist learning theory, which posits that learners actively construct knowledge through authentic, real-world tasks and collaborative interactions, making instruction more student-centered and participatory (Vygotsky, 1978; Loyens & Gijbels, 2017). Together, these theoretical frameworks justified the integration of innovative teaching practices and guided both the design and evaluation of the instructional strategies.

Teaching Methodologies

Effective communication is an essential factor in professional life. Irrespective of the profession, the skill to share information, convey thoughts, build relationships or collaborate with others is indispensable. Communication skills will reduce misunderstandings, improve workplace efficiency, encourage a positive work culture and help to be a better professional. Communication skills are not just professional competence; it is a fundamental necessity.

Communication skills is a course taught to engineering students in first year, second year and third year. The traditional teaching includes classroom teaching of thirty hours and practical sessions of 30 hours per class in a semester. The in-semester assessment includes assignments based on the syllabus and practical activities along with documentation. The assignments and practical activities are designed to be activity-based to have more student involvement.

Flipped Classroom: In a flipped classroom, the traditional way of teaching is with teacher explaining the concept using a lecture method, followed by assignments and exercises, is flipped. The study material, list of books and instructional videos are provided to the students for a specific topic before the class begins and students understand and review it at their own pace. The class session is used for active learning through interaction, activities and presentation under a teacher's supervision. Doubt-solving sessions are also included to bring clarity to the topic. Through peer learning and presentations, students understand the topic in a better way.

Bergmann & Sams (2012) introduced the flipped classroom concept, where students engage with instructional content (like videos) before class, freeing up classroom time for interaction and communication practice. McLaughlin et al. (2014) demonstrated that the flipped classroom significantly improves engagement and communication competencies among health sciences students through peer discussion and active learning. Baig, M. I., & Yadegaridehkordi, E. (2023) offered a comprehensive review of technologies and pedagogical approaches, showing flipped classrooms enhance engagement, critical thinking, and 21st-century communication skills. Wei, X. (2025) observed that flipped instruction over eight weeks significantly improved high school students' listening comprehension by 15.9% (vs. 3.4% control) and boosted speaking fluency, accuracy, confidence, and motivation. The flipped classroom model improves student engagement and deepens understanding by shifting content delivery to outside the classroom and using class time for active learning. In communication skills, it allows learners to analyze, apply, and discuss concepts more interactively.

Poster Making: Digital Poster making activity during practical sessions for certain concepts of communication skills enhances class engagement, group coordination, creativity and activity-based learning. Poster presentations enhance visual communication, synthesis of information, and creativity in expressing complex ideas concisely. It also improves verbal and non-verbal communication. Rowe & Ilic (2009) found that poster presentations foster academic knowledge sharing and improve visual-verbal integration, which is key to effective communication. Kermish-Allen et al. (2015) specified that poster-based activities help students synthesize information and develop clearer communication. Poster making and presentation highlights best

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Journal for Research Scholars and Professionals of English Language Teaching
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Vol. 10 | Issue 53 | January 2026 www.jrspelt.com

practices such as using conversational tone, analogies, bullet point summaries, and strong eye contact to improve audience engagement.

Survey-Based Mini Projects

Survey-based mini-projects on the topics of communication skills promote interpersonal communication, critical thinking, and real-world engagement. Students select a topic based on the syllabus and undertake survey using questionnaires, collect data, interpret data, analyze it and present conclusions along with recommendations. This helps them to learn about formal communication and critical thinking. Spronken-Smith et al. (2012) showed that inquiry-based learning, including student-conducted surveys, promotes critical thinking, communication, and application of concepts through real-world interaction. Conducting surveys develops inquiry-based learning, research writing, and interpersonal communication by involving students in real-life data collection and interpretation. It also promotes group learning and coordination.

Group Discussion (GD)/Debate

Group discussion encourages collaborative learning, critical thinking, and articulation skills, while promoting active participation and peer learning. Brookfield & Preskill (2005) emphasized that group discussion fosters democratic engagement and deeper understanding of communication dynamics through active participation. Bansal & Dhananjay (2020) demonstrated that GD significantly enhances confidence and clarity in spoken communication among Indian college students.

Debating hones logical argumentation, persuasion, public speaking, and respectful disagreement, which are core to effective communication, Guardian report (2024). Debate clubs in state schools are increasingly recommended to develop oracy skills, critical thinking, and confident public speaking even in under-resourced settings. Lu, J. et al. (2025). Debate training increases leadership outcomes in workplaces. Employees who received nine-weeks of debate training were 12% more likely to move into leadership roles; student debate training boosted leadership traits in peer contexts.

Elevator Pitch

An elevator pitch helps students practice concise, compelling self-presentation, a vital workplace skill in networking and professional communication. Dannels (2002**)** underlined the need to teach concise communication for professional disciplines, with the elevator pitch being a practical strategy. Clark (2010**)** encouraged the use of elevator speeches to build self-confidence and clarity in delivering personal or business messages under time constraints. Beltrán-Palanques (2024) describes a three-phase genre-based multimodal framework (deconstruction, joint construction, independent practice) that helps ESP students develop concise, persuasive elevator pitch communication.

Case Study Method

The case study method presents students with complex, realistic narratives or problems that require analysis, reasoning, decision-making, and communication of conclusions. In communicative training, cases are used both for written/oral argumentation (e.g., presenting an analysis or recommendation) and for group discussion exercises that require listening, turn-taking, and persuasive structuring. Pedagogically, teachers function as facilitators who guide discussion, probe assumptions, and scaffold abstraction from a specific scenario to general principles (Prada et al., 2017; Tan et al., 2014).

Empirical studies across higher-education fields report that case-based teaching improves students' analytical reasoning, ability to apply theory to practice, collaborative discussion skills, and confidence in presenting reasoned arguments (TaBLE Case Method Evaluation, 2023; Teaching-with-Case-Method Review, 2025). For example, nursing and teacher-education studies show that carefully designed case activities increase critical thinking and foster communication and collaboration among students (Ajani & Moez, 2011; Martinez-Rodrigo et al., 2017), and experimental studies in physics and computer science confirm significant gains in analytical and collaborative skills (Amelia et al., 2024; Kundra & Sureka, 2016). Qualitative research also suggests

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students perceive deeper understanding and greater readiness for real-world tasks after case-based sessions (Prada et al., 2017).

Cases are strong for developing analytical, organized, and presentational communication. They require students to structure arguments, synthesize information, and present recommendations to an audience (Amelia et al., 2024; Kundra & Sureka, 2016).

Role Play

Role play is a structured form of simulation in which learners enact roles in realistic interactions such as interviewer-candidate, clinician-patient, or teacher-parent to practice interpersonal communication, pragmatic strategies (e.g., turn-taking, politeness), and nonverbal behaviors (Nestel & Tierney, 2007). These activities range from lightly scripted micro-scenarios to high-fidelity enactments with trained actors or standardized patients (Gelis et al., 2019). Effective implementations typically integrate pre-briefing, enactment, structured feedback from peers, tutors, or actors, debriefing, and reflective writing to enhance skill development (Nestel & Tierney, 2007; Wang et al., 2024). While many studies report positive learner perceptions such as increased confidence, empathy, and self-assessed communication competence. Systematic reviews indicate that objective evidence of skill transfer to clinical or professional contexts, though mixed, is steadily growing (Gelis et al., 2019; Wang et al., 2024). In medical and allied-health education, randomized and quasi-experimental studies comparing peer role play, standardized patients, and other simulation modalities have shown that role play, particularly when coupled with structured feedback and guided reflection, leads to measurable improvements in observable communication behaviors and counselling skills (Wang et al., 2024). Reviews of peer role-play and standardized-patient approaches consistently report favorable outcomes but highlight that effect sizes vary according to factors such as the realism of the scenario, the feedback model used, and the fidelity of the assessment (Gelis et al., 2019; BMC Medical Education). Peer role play also emerges as a cost-effective alternative to standardized patients while still supporting development of interactional competence, spontaneous response, pragmatic strategy use, and affective skills such as empathy and confidence (BMC Medical Education; Nestel & Tierney, 2007). Curricular designs that intentionally sequence micro-cases to build analytic clarity alongside role-play scenarios to strengthen pragmatic agility are more likely to address the full range of communication outcomes than reliance on either method alone (Gelis et al., 2019; Nestel & Tierney, 2007).

E-Portfolios (digital portfolios)

E-portfolios are digital collections of student work accompanied by reflective commentary. Empirical studies report consistent positive effects on self-efficacy, behavioral engagement, and higher-order skills such as problem-solving, creativity, and analytical thinking (Yang, 2022; Bellemare et al., 2021). Reflection quality, in particular, has been identified as a strong predictor of learning gains and final grades (Yang, 2022). Portfolios are most impactful when implemented with a structured framework, including clear prompts, iterative feedback, and opportunities for artifact revision, ensuring that they function as metacognitive tools rather than static repositories (Yang, 2022). Additional benefits include enhanced digital literacy and the ability to document transferable skills in a professional format. However, challenges remain in terms of faculty workload, ensuring equitable access to technology, and sustaining student engagement (Yang, 2022). E-portfolios support longitudinal, reflective development of communication skills

Electronic portfolios (e-portfolios) have been widely studied in higher education as tools that support reflection, formative assessment, and the documentation of curricular and transferable skills. Recent systematic reviews and empirical work converge on three linked claims: (a) e-portfolios foster reflection and metacognition, (b) they function effectively as platforms for formative feedback and evidence of learning, and (c) their positive effects critically depend on implementation design (clear prompts, teacher/technical support, and assessment architecture). E-portfolios encourage self-reflection and help students make learning processes visible, supporting metacognitive development such as planning, monitoring and evaluating one's own learning. (Zhang & Tur, 2024)

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Video Resumes / Video-CVs

Video resumes, or video-CVs, have emerged as authentic speaking and presentation tasks that integrate verbal content, paralinguistic cues, body language, and visual framing, reflecting the multimodal nature of professional communication (Hiemstra, 2020; Muralidharan et al., 2021). Without targeted guidance, students often struggle with delivery aspects such as intonation, facial expressions, posture, and creative presentation, all of which are crucial for audience engagement (Kaur & Singh, 2019). Research shows that structured scaffolding through explicit instruction, exemplars, and iterative feedback can significantly enhance the technical and expressive quality of student video resumes, leading to increased confidence and perceived employability (Vázquez-Cano et al., 2020). The pedagogical basis for such tasks lies in scaffolding theory (Wood et al., 1976), which emphasizes the gradual release of responsibility through staged support, enabling learners to develop complex skills by progressing from guided practice to independent production. In the video-CV context, this process may involve providing models, breaking the task into manageable components (e.g., scripting, vocal delivery, non-verbal cues), and offering targeted feedback at each stage (Hafner & Miller, 2019). Equally important is the development of multimodal literacy, the ability to interpret and create meaning across multiple semiotic modes (Kress, 2010), which is critical for producing high-quality video resumes that blend verbal, visual, and gestural communication. When scaffolding and multimodal literacy frameworks are combined, instruction fosters both linguistic and presentation competencies while equipping learners with the digital communication skills required in contemporary employment landscapes (Jewitt, 2017; Lim et al., 2021; Zhang & Van der Veen, 2022)

Constructivist learning theory emphasizes that learners actively construct knowledge through interaction with their environment, rather than passively receiving information from instructors. Rooted in the work of scholars such as Piaget and Vygotsky, the theory highlights the importance of prior knowledge, social collaboration, and authentic problem-solving in the learning process. Within this framework, the teacher functions as a facilitator who designs meaningful, real-world tasks that encourage students to engage in inquiry, reflection, and dialogue. By situating learners at the center of the educational experience, constructivist pedagogy fosters deeper understanding, critical thinking, and the transfer of skills to new contexts, making it particularly relevant for communication skills development in professional education (Mattar, 2018; Taber, 2020).

Kolb's Experiential Learning Cycle is a widely recognized model that explains how individuals learn through experience. It emphasizes learning as a continuous process where knowledge is created through the transformation of experience. The cycle consists of four stages: Concrete Experience, where learners actively engage in an activity; Reflective Observation, where they reflect on and observe their experiences; Abstract Conceptualization, where insights and theories are developed based on reflection; and Active Experimentation, where learners apply these new ideas to test and refine their understanding. By moving through these stages, learners integrate practical experience with conceptual understanding, promoting deeper learning, problem-solving skills, and adaptability in real-world situations. This model is especially valuable in education and professional development, as it encourages hands-on involvement and critical reflection rather than passive learning (Kolb & Kolb, 2024; Egan et al., 2023).

3. Results and Discussions

Descriptive findings - The percentage of skills covered in the selected activities is shown below in the table. The questionnaires shared with students and online forms were analyzed to find out the reflections of students on the innovative teaching methodologies for the subject communication skills. A total of ten activities were considered for the study, including group discussions, debates, flipped classroom, survey-based mini-project, creating a video resume, preparing an e-portfolio, analysis of case studies, role plays, poster-making activity and an elevator pitch. The results revealed that group discussion and debate (89%) are the most preferred activity, as students think that it develops communication, listening skills, fast thinking, team participation, patience, confidence to put ideas in front of the group, respecting opinions and leadership. Flipped classroom (79%) helped them to understand communication, presentation and boosted their confidence in facing the audience and managing the team. Role - play (79%) gave them an opportunity to work on communication skills essential for

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ISSN: 2456-8104 Impact Factor: 6.895 (SJIF)
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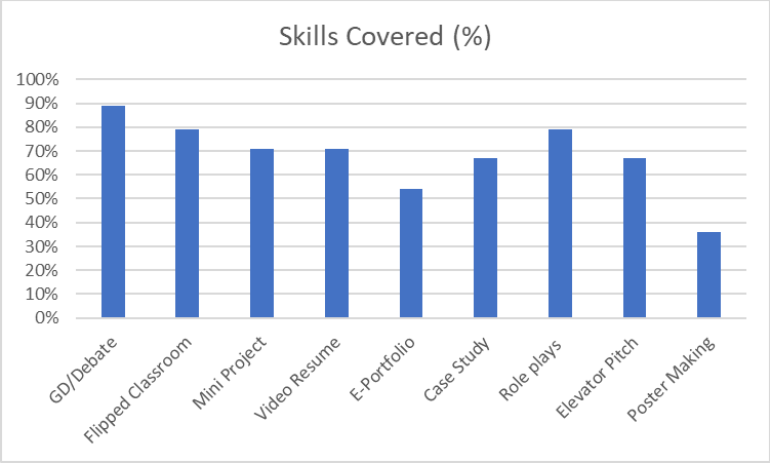
the given situation. Survey-based mini-project (71%) helped them to plan, collaborate, conduct surveys, gather data, analyze data, interpret data, draft reports and present results. It gave them ideas about survey-based research. The creativity, organizing information, selecting design, using professional language, made a video resume and E-portfolio (71%/ 54%) enjoyable activities. Elevator pitch (67%) taught them to be concise, precise and confident in communication, whereas poster making was a creative activity that focused on critical thinking.

Activity	Skills Covered (%)
GD/Debate	89%
Flipped Classroom	79%
Survey-based Mini Project	71%
Video Resume	71%
E-Portfolio	54%
Case Study	67%
Role plays	79%
Elevator Pitch	67%
Poster Making	36%

Table 1: Percentage of Skills covered for selected activities



Graph 1

Inferential Analysis

Chi-square Test Results

Analysis	χ^2	df	N	p-value
Teaching Activities	28.23	8	100	4.32e-04

Table 2

The Chi-square Goodness of Fit test was employed to evaluate the student feedback data. For teaching activities, the test yielded a significant result ($\chi^2 = 28.23$, df = 8, N = 100, $p < 0.05$), rejecting the null hypothesis. This indicates that the distribution of perceived effectiveness across activities was not uniform. Activities such as GD/Debate (89%), Flipped Classroom (79%), and Role Plays (79%) were rated much higher in skill coverage compared to Poster Making (36%), which was least effective.

Cognitive Skill Measurement through Bloom's taxonomy

Descriptive findings - Bloom's taxonomy levels from lower order thinking to higher order thinking were used to measure cognitive skills. Analysis of 100 feedback responses specified that 34.29% of students conveyed that activities helped them apply knowledge (Applying), 14.33% conveyed enhanced analytical skills (Analysis), 26.47 % informed improved evaluation skills (Evaluate) and 23.98% reported enhanced creativity through

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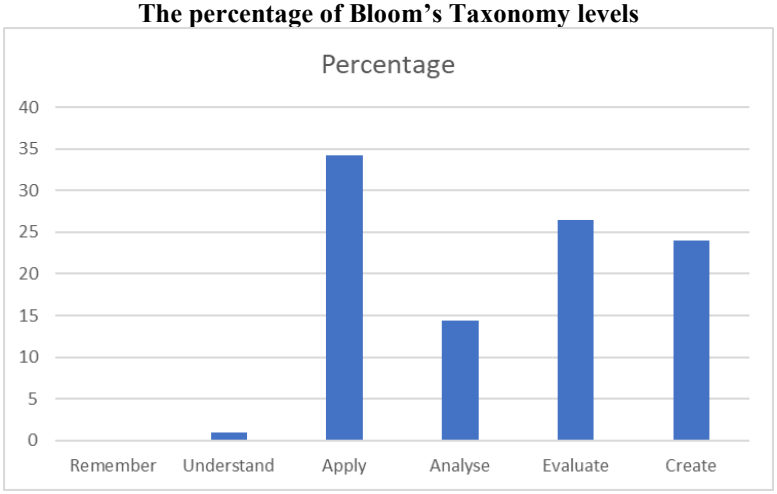
activities (Create). The lower percentage was recorded for understanding (0.93%) and remembering (0%). The result suggests that the innovative teaching methodology predominantly supports higher -order cognitive skills. The pedagogical significance of activities focusing on active learning efficiently supports higher order cognitive skills such as Apply, Evaluate and Create aligning with Bloom's framework.

The result highlights the shift in the learning process beyond rote memorization towards critical thinking, problem-solving, research and improved communication, which are key competencies in professional development. It strongly aligns with outcome-based education nurturing skills that prepare students for professional life. The selected methodologies enhance the learning experience.

Bloom's Taxonomy Levels	Percentage
Remember	0
Understand	0.93
Apply	34.29
Analyse	14.33
Evaluate	26.47
Create	23.98

Table 3

The percentage of Bloom's Taxonomy levels



Graph 2

Inferential Analysis

Chi-square Test Results

Analysis	χ^2	df	N	p-value
Bloom's Taxonomy	58.88	5	100	2.07e-11

Table 4

For Bloom's Taxonomy, the chi-square analysis also revealed a statistically significant difference ($\chi^2 = 58.88$, df = 5, N = 100, $p < 0.05$), rejecting the null hypothesis. Students' learning outcomes were concentrated at the higher-order levels, particularly Apply (34.29%) and Evaluate (26.47%), while Remember (0%) and Understand (0.93%) were minimally represented.

Discussion

The findings clearly demonstrate that innovative teaching methodologies have a different impact on students' learning outcomes. The significant variation in activities suggests that interactive, discussion-based, and experiential methods (e.g., GD/debate, flipped classroom, role play) are perceived as far more effective in developing communication and professional skills than static or individual-based tasks such as poster making.

These findings confirm that different innovative methods impact different dimensions of communication competence, validating the use of a multi-strategy pedagogical approach.

Similarly, the analysis of Bloom's Taxonomy levels highlights that these methodologies predominantly foster higher-order cognitive skills such as application, analysis, and evaluation, while lower levels like remembering and understanding are almost absent. This aligns with the objectives of competency-based education under NEP 2020, which emphasizes critical thinking, problem-solving, and creativity rather than rote memorization. The majority of responses clustered at Apply, Analyze, and Evaluate, indicating that the interventions successfully moved students beyond rote learning toward higher-order thinking.

This pattern aligns with the intended curriculum design, where activities like role plays and debates inherently encourage evaluation and creation, while tasks such as poster-making foster application and analysis.

Overall, the results underscore the importance of adopting learner-centric, participatory, and higher-order skill-oriented teaching methods in professional courses. Statistical evidence strengthens the argument that innovative pedagogies not only engage students more effectively but also better equip them with the cognitive and communication competencies required in real-world contexts.

The results support the argument that innovative, experiential teaching methodologies significantly enhance students' communication skills compared to traditional lecture-based instruction. Specifically:

Active Participation- Group discussions, debates, and role-play align with constructivist principles, as students co-constructed knowledge through interaction, aligning with Vygotsky's social learning framework.

Professional Readiness - Tools such as video resumes and e-portfolios resonate with Kolb's Experiential Learning Cycle, where students engaged in concrete tasks, reflected on their experiences, and produced professional artefacts.

Higher-Order Thinking - The Bloom's taxonomy-based analysis confirms that innovative pedagogies foster critical analysis, evaluation, and creative output, extending beyond basic comprehension.

Practical Implications - The study suggests that a multi-modal pedagogy, integrating traditional content delivery with interactive tasks, provides a balanced approach to developing both foundational and advanced communication competencies among engineering students.

Limitations and Future Scope

Despite the positive outcomes, certain limitations must be acknowledged:

The study was confined to one institution and a relatively small sample (N = 100), limiting applicability. Self-reported perceptions may carry bias; future research should triangulate findings with performance-based assessments of communication skills. Future studies should also integrate technology-mediated learning tools like virtual presentations, AI-driven feedback etc. to examine their potential in enhancing communication pedagogy.

4. Conclusion

The findings of this study underline the effectiveness of integrating innovative teaching practices into communication skills pedagogy for engineering students. By aligning instructional strategies with Bloom's Taxonomy, Kolb's Experiential Learning Cycle, and constructivist learning principles, the learning approaches successfully promoted higher-order thinking, professional readiness, and active engagement. The results demonstrate that a multi-strategy approach incorporating debates, role plays, flipped classrooms, and digital artefacts can foster both cognitive development and practical competence, preparing learners for real-world communication contexts. Statistical analysis demonstrates that innovative teaching methodologies have a differential impact on student learning outcomes. Interactive, discussion-based, and application-oriented

approaches were significantly more effective in developing professional and cognitive skills. These findings underscore the importance of adopting learner-centric methods that foster higher-order thinking and engagement.

While the study is limited in scope to a single institutional context and relies on self-reported perceptions, the outcomes provide a strong foundation for further exploration of blended and technology-mediated pedagogies. Future research should expand across larger and more diverse samples. The pedagogical implications of these activities focus on a clear shift from teacher-centered to learner-centered methods, highlighting active participation, teamwork, and experiential learning. Teachers act as facilitators, mentors, and instructors rather than mere content deliverers, creating opportunities for peer learning, inquiry, and reflection. Ultimately, this study contributes to the growing discourse on competency-based education, offering empirical evidence that innovative, student-centered methods are essential for cultivating communication proficiency in twenty-first-century engineering education.

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Conflicts of Interest: The authors declare “No conflict of interest".

Acknowledgments: I am deeply grateful to the faculty of Humanities department, Vidyalankar Institute of Technology, Mumbai for their support, and valuable suggestions. I acknowledge the assistance of Prof. Aarti Koduri in data collection and technical help. Finally, I extend my sincere appreciation to our students for their feedback and help with data collection.

Author Contributions: The first author, Dr. Leena Potdar was primarily responsible for the conception of the study, data analysis, and interpretation of results, and led the drafting and critical revision of the manuscript. The second author, Prof. Aarti Koduri contributed to the acquisition of data, assisted in organizing and formatting the dataset, and supported the preparation of the manuscript. Both authors reviewed the final version of the manuscript and approved it for submission.

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