



IARE

INSTITUTE OF AERONAUTICAL ENGINEERING

TEACHING INNOVATION & PEDAGOGICAL SUPPORT (TIPS)

HyFlex Learning, ELRV Ecosystem
& Academic Monitoring



Dr. R. Ramya Swetha
Dean – TIPS



INNOVATE
Teaching



ENGAGE
Students



EMPOWER
Faculty



EXCEL
Academically



ENHANCE
Excellence

TIPS (TEACHING INNOVATION & PEDAGOGICAL SUPPORT) HANDBOOK

ACADEMIC YEAR 2026–27



Institute of Aeronautical Engineering
Dundigal, Hyderabad – 500 043



www.iare.ac.in



Education for Liberation

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In an era defined by rapid technological advancement and evolving learner expectations, the Institute of Aeronautical Engineering (IARE) has established the Teaching Innovation & Pedagogical Support (TIPS) framework as a strategic institutional response to the imperatives of modern engineering education. TIPS is not merely a policy directive — it is a living ecosystem of practice, designed to empower educators, engage learners, and ensure that every academic interaction is purposeful, measurable, and transformative.

This handbook documents the TIPS framework in its entirety — its philosophy, structure, pedagogical methodologies, digital initiatives, student engagement strategies, and institutional impact. It is intended as a comprehensive reference for faculty, academic administrators, students, IQAC members, and accreditation evaluators who seek to understand how IARE translates its commitment to pedagogical excellence into day-to-day academic practice.

The TIPS framework encompasses multiple institutional initiatives including the HyFlex Learning model, the E-Learning Readiness Videos (ELRV) programme, structured outcome-based assessment mechanisms, continuous monitoring systems, and multi-modal pedagogical methodologies. Together, these components create an integrated, data-informed, and student-centered teaching-learning environment aligned with NAAC A++ , NBA Tier-I Washington Accord, NEP 2020, and OBE standards.

I invite all members of the IARE academic community and visiting evaluators to engage with this document as a testament to our institutional resolve and a roadmap for continuous improvement in teaching and learning.

Dr. R. Ramya Swetha

Dean – TIPS

Institute of Aeronautical Engineering (Autonomous)

"Learn Continuously. Think Critically. Innovate Confidently. Succeed Meaningfully."

The Teaching Innovation & Pedagogical Support (TIPS) framework at IARE represents a comprehensive, institution-wide commitment to advancing the quality, relevance, and impact of teaching and learning across all academic departments. Established under the leadership of the Dean – TIPS, the framework integrates pedagogical innovation, digital learning infrastructure, structured assessment systems, and data-driven monitoring into a unified academic ecosystem.

TIPS operates on the conviction that teaching excellence is not an outcome of individual effort alone, but a product of institutional design — built through structured support, continuous professional development, technology enablement, and evidence-based improvement cycles. Every initiative under TIPS is aligned with the principles of Outcome-Based Education (OBE), NEP 2020 mandates, and the accreditation standards of NAAC and NBA Tier-I.

2.1 Institutional Context

Parameter	Details
Institution	Institute of Aeronautical Engineering (IARE), Autonomous
Accreditation	NAAC A++ Grade NBA Tier-I Washington Accord NIRF Engineering 151–200
TIPS Framework Lead	Dr. R. Ramya Swetha, Dean – TIPS
Departments Covered	11 Academic Departments across all B.Tech, M.Tech programmes
Academic Year	2026–27
Pedagogical Standard	OBE, NEP 2020, NBA, NAAC Aligned
Digital Platform	Edpuzzle (ELRV) Akanksha Portal SWAYAM ExEED
Student Reach	All enrolled B.Tech students across I – IV Year

2.2 TIPS at a Glance

Innovate Teaching	Engage Learners	Inspire Excellence	Outcomes Driven	Technology Supported	Continuous Improvement
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The TIPS framework encompasses six institutional commitments that define the character and direction of all academic delivery at IARE. These pillars collectively ensure that every student receives instruction that is innovative, engaging, and measurably effective.

The Teaching Innovation & Pedagogical Support (TIPS) framework is driven by a consolidated set of institutional objectives that reflect IARE's commitment to academic excellence, student success, and continuous improvement. These objectives guide all TIPS initiatives, digital learning programmes, pedagogical practices, and quality assurance activities across the institution.

Objective	Description
Strengthen Teaching Quality	Continuously enhance the effectiveness of academic delivery through structured pedagogical support, faculty development, and evidence-based instructional design across all departments
Promote Student-Centered Learning	Ensure that all teaching-learning activities are designed around the needs, pace, and progress of individual learners, enabling personalized and self-directed academic growth
Integrate Technology in Education	Deploy technology-enabled learning tools, digital content platforms, and analytics-driven monitoring systems to modernize and strengthen academic engagement
Enable Flexible Learning Access	Provide students with structured, anytime-anywhere access to curriculum-aligned academic resources through HyFlex Learning and ELRV initiatives
Ensure OBE Alignment	Map all instructional content, assessments, and learning activities to measurable Course Outcomes (COs) and Program Outcomes (POs) in compliance with OBE standards
Foster Continuous Improvement	Establish data-informed feedback cycles that enable faculty, departments, and institutional leadership to continuously refine teaching practices and curriculum delivery
Support Formative Assessment	Integrate continuous, formative assessment mechanisms within academic delivery to monitor student progress and inform timely academic interventions
Build Digital Learning Competencies	Equip students with 21st-century digital learning skills aligned with industry expectations through technology-embedded academic programmes
Align with Accreditation Standards	Generate structured evidence of teaching quality, student engagement, and learning outcomes to support NAAC, NBA, and institutional quality assurance requirements
Empower Faculty as Innovators	Provide faculty with the training, tools, and institutional recognition needed to continuously innovate their teaching approaches and contribute to pedagogical excellence

The TIPS framework at IARE is structured as a multi-layered institutional architecture that integrates pedagogical methodologies, digital learning platforms, monitoring systems, and governance mechanisms into a coherent, outcome-oriented system. The framework is designed to be scalable, evidence-based, and continuously improving, reflecting the institutional standards required by NAAC A++ and NBA Tier-I accreditation.

4.1 Framework Architecture

Framework Layer	Description & Institutional Function
Pedagogy Layer	Structured learning methodologies including SBL, EL, PBL, ACL, CBL, and EML applied across all courses and programmes
Content Layer	Faculty-developed curriculum-aligned content including ELRV videos, CLRV recordings, course full stack materials, and digital resources
Platform Layer	Technology platforms including Edpuzzle, Akanksha Portal, SWAYAM, ExEED, and ICT Studio infrastructure
Assessment Layer	Embedded formative assessments, continuous evaluation, mid-semester tests, and end-semester examinations aligned with CO attainment
Analytics Layer	Real-time monitoring of student completion, engagement, performance trends, and learning gap identification across departments
Governance Layer	Multi-tiered oversight hierarchy: Faculty → Class In-Charge → HOD → Dean TIPS → PMCS for academic accountability

4.2 TIPS Core Pillars

Innovate Teaching	Engage Learners	Inspire Excellence	Driven by Outcomes	Supported by Technology	Committed to Improvement
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4.3 Dean TIPS – Roles and Responsibilities

Responsibility	Scope of Action
Strategic Oversight	Coordinate and govern all TIPS initiatives across 11 departments; ensure institutional alignment with OBE, NAAC, and NBA standards
Analytics Review	Review institution-wide engagement metrics, learning analytics, and ELRV completion reports on a periodic basis
Pedagogical Alignment	Align all digital learning programmes, faculty development initiatives, and pedagogical activities with TIPS goals
Faculty Development	Lead faculty capacity building in digital content creation, MCQ design, analytics use, and evidence-based instructional design
Quality Assurance	Ensure all TIPS outputs contribute structured evidence for NAAC, NBA, and IQAC accreditation and quality audit requirements

Policy & Innovation	Make institutional decisions on platform adoption, pedagogical policy, and technology integration for academic delivery
PEDAGOGICAL METHODOLOGIES Student-Centered Learning Practices at IARE	

IARE deploys a diverse portfolio of pedagogical methodologies designed to address the varied learning needs of engineering students, bridge the gap between academic knowledge and professional competency, and ensure measurable learning outcomes across all programmes. These methodologies are embedded across courses, semesters, and departments as part of the TIPS framework.

S.No	Methodology	Description & IARE Initiatives	Tools & Platforms
01	Subject-Based Learning (SBL)	The foundational methodology of academic delivery at IARE. Faculty deliver structured curriculum content using whiteboards, presentations, digital platforms, and recorded video resources. SBL initiatives include Course Content Delivery, ELRV, CLRV, Industry Integration in Teaching, Curriculum Mapping to Job Roles, Bootcamps, Course Full Stack Learning Materials, and Honors / Minor Programmes.	Whiteboards, Presentations, Edpuzzle, Akanksha Portal
02	Experiential Learning (EL)	Connects theoretical knowledge with real-world application through internships, industrial visits, laboratory work, community service, and simulation activities. EL develops professional competencies, problem-solving abilities, and industry readiness beyond classroom boundaries.	Industry Internships, Labs, Field Visits, SkillUP/SkillNext/SkillBridge
03	Project-Based Learning (PBL)	Students engage in structured multi-semester engineering design and research projects that require application of cross-disciplinary knowledge. PBL initiatives span from mini-projects in early semesters to Capstone Projects (14 credits) in the final year.	Project Labs, BIM Lab, GIS Lab, Capstone Design, MSME Hackathon
04	Active & Collaborative Learning (ACL)	Encourages peer interaction, group problem-solving, and shared learning experiences. ACL activities include seminars, group projects, team-based ELRV follow-ups, peer assessments, and discussion forums that promote critical thinking and communication skills.	Group Activities, Peer Learning, Collaborative Platforms
05	Case-Based Learning (CBL)	Uses real-world industry scenarios and professional case studies to develop analytical reasoning, contextual judgment, and decision-making skills. Scenario-embedded MCQs in ELRV videos represent a digital application of CBL within the HyFlex ecosystem.	Industry Case Studies, Scenario Assessments, ELRV MCQs
06	Entrepreneurially Minded Learning (EML)	Cultivates innovation, entrepreneurial thinking, and professional initiative through design challenges, hackathons, idea competitions, and startup mentoring. EML is reinforced through institutional innovation festivals and national-level competitions.	Idea Hackathons, Innovation Lab, Startup Mentoring, SkillBridge

5.1 Pedagogical Methodology Alignment with Learning Outcomes

Methodology	Primary Learning Outcomes	Key Tools & Activities
Subject-Based Learning	Conceptual Mastery, Knowledge Retention, CO Attainment	ELRV, CLRV, Course Content, HyFlex Platform
Experiential Learning	Skill Application, Industry Readiness, Professional Competence	Internships, Labs, Community Projects
Project-Based Learning	Design Thinking, Research Ability, Complex Problem Solving	Capstone, Mini Projects, Innovation Labs
Active & Collaborative Learning	Teamwork, Communication, Peer Learning	Group Work, Seminars, Peer Assessment
Case-Based Learning	Critical Thinking, Contextual Analysis, Judgment	Case Studies, Scenario MCQs
Entrepreneurially Minded Learning	Innovation, Creativity, Entrepreneurship	Hackathons, Startup Incubation, Competitions

HyFlex Learning is one of the major digital learning initiatives under the TIPS framework at IARE. It combines Hybrid and Flexible learning methodologies to create a student-centered academic ecosystem that extends beyond the boundaries of conventional classroom instruction. Under HyFlex, students are provided with structured, technology-enabled access to curriculum-aligned academic content, enabling continuous learning engagement aligned with their individual pace and schedule.

6.1 Concept and Purpose

Concept	HyFlex Learning integrates classroom instruction with digital content delivery, enabling students to access structured learning resources anytime, anywhere through the institutional ELRV ecosystem
Purpose	To ensure academic continuity, flexible content access, and real-time engagement monitoring beyond formal contact hours, reinforcing learning outcomes aligned with OBE standards
Scope	Deployed across all 11 departments of IARE, covering multiple semesters, core theory courses, laboratory-adjacent content, and bridge subjects for comprehensive student coverage
Alignment	Aligned with NEP 2020, OBE frameworks, NAAC A++, and NBA Tier-I requirements for technology-enabled and outcome-oriented academic delivery

6.2 Implementation Approach

HyFlex Learning – End-to-End Implementation

- ✓ Faculty develop topic-wise ELRV video modules aligned with course syllabi and OBE learning outcomes
- ✓ Videos are uploaded to the Edpuzzle platform with embedded MCQs at pedagogically significant intervals
- ✓ Sessions are assigned to students through institutional email IDs (rollnumber@iare.ac.in) with completion deadlines
- ✓ Students access and complete ELRV sessions at their own pace through the Edpuzzle student dashboard
- ✓ Faculty monitor real-time completion, watch time, and MCQ performance through analytics dashboards
- ✓ Non-completions are flagged and followed up through the class in-charge and academic coordination chain
- ✓ Analytics data informs classroom instruction, content revision, and targeted academic interventions

6.3 HyFlex TIPS Pedagogical Support Pillars

TIPS Pillar	HyFlex Integration Description
ELRV Integration	Structured video-based learning for concept reinforcement and continuous academic engagement
Interactive Learning	Embedded MCQ assessments within videos promote active participation and in-context evaluation
Outcome-Focused Delivery	All HyFlex content is mapped to measurable Course Outcomes and Program Outcomes under OBE
Student-Centered Access	Self-paced, anytime-anywhere content access accommodating diverse learner needs and schedules
Continuous Improvement	Analytics data drives iterative content revision, faculty development, and academic monitoring

6.4 Benefits of HyFlex Learning

Student Benefits	Institutional Benefits
✓ Enhanced conceptual understanding through repeated, self-paced video access ✓ Continuous learning beyond formal classroom contact hours ✓ Flexible academic access irrespective of location or time ✓ Improved assessment readiness through embedded formative tests ✓ Real-time performance feedback through MCQ scores and analytics ✓ Alignment with 21st-century digital learning competencies	✓ Technology-enabled monitoring aligned with NEP 2020 and OBE standards ✓ Data-driven decision-making for faculty development and curriculum review ✓ Scalable engagement tracking across 11 departments and divisions ✓ Structured evidence for NAAC and NBA accreditation documentation ✓ Institutional commitment to TIPS pedagogical excellence ✓ Enhanced ranking and accreditation quality indicators

The E-Learning Readiness Videos (ELRV) initiative forms the academic foundation of the HyFlex ecosystem at IARE. Faculty members develop curriculum-aligned video learning modules integrated with embedded formative assessments and deploy them through the Edpuzzle platform to strengthen learning continuity, conceptual reinforcement, and academic engagement across all semesters and departments.

7.1 ELRV Platform Features

Platform Feature	Description
Interactive Video Learning	Topic-wise faculty-recorded videos assigned via Edpuzzle; students engage at their own pace with full content control
Embedded MCQ Assessments	Multiple-choice questions paused at strategic video intervals for in-context formative assessment and comprehension reinforcement
Continuous Monitoring	Live faculty dashboards tracking completion status, watch duration, and assessment scores in real time
Cumulative Score Tracking	Individual and aggregate scores tracked across all ELRV sessions for longitudinal academic performance analysis
Institutional Authentication	Secure login via rollnumber@iare.ac.in ensures data integrity and accurate academic record-keeping

7.2 ELRV Sessions Conducted – Academic Year 2025–26

II Semester

Course	Topic	Duration	Faculty
Ordinary Differential Equations & Vector Calculus	Non-Exact Differential Equations (Method 4)	27 min	Dr. P Raja Kumari
Data Structures	Minimum Spanning Trees – Kruskal's Algorithm	08 min	Prof. E Krishna Rao Patro

IV Semester

Course	Topic	Duration	Faculty
Database Management Systems	Extended ER Model	46 min	Dr. K Suvarchala
Design and Analysis of Algorithms	Greedy Method	52 min	Dr. K Suvarchala

ELRV sessions are conducted across all 09 departments, covering core theory courses, laboratory-adjacent topics, and bridge subjects to support students between formal contact hours.

7.3 Summer ELRV Programme

Summer ELRV courses provide students with structured digital learning resources during academic breaks, covering both core engineering and emerging technology domains to enhance conceptual readiness and employability.

Core Engineering Courses	Technology & Professional Courses
• Operating Systems • Design & Analysis of Algorithms • Object Oriented Programming • Computer Networks • Basic Electrical & Electronics Engineering • Engineering Graphics	• AI Foundations • Web Systems Engineering • Java Full Stack • Constitution of India

7.4 Analytics Dashboard Views

Edpuzzle Analytics – Faculty & Coordinator Dashboard Views

- ✓ Gradebook View: Student-wise scores, time-spent, and topic-completion overview across all assigned sessions
- ✓ Completion View: Roll numbers, completion status, scores, and submission timestamps for each ELRV assignment
- ✓ Individual Student Analytics: Progress percentage, grade, attempts, watch timeline, and question-level performance
- ✓ Assignment View: Embedded MCQ responses at defined video timestamps for formative assessment review
- ✓ Content Library View: Faculty-organized ELRV video library categorized by course, module, and topic

Student engagement at IARE is driven by a multi-channel strategy that extends beyond classroom participation to encompass digital learning, experiential activities, formative assessment, and academic mentoring. The TIPS framework ensures that every student has multiple structured pathways to remain continuously engaged with academic content and institutional learning activities.

8.1 Engagement Strategies

Engagement Strategy	Description
ELRV Session Completion	Students complete assigned video modules with embedded MCQs through Edpuzzle, ensuring structured self-paced engagement with curriculum content
Akanksha Portal Access	Structured course content, What You'll Learn modules, and learning resources are accessible through the institutional LMS for all enrolled students
Experiential Activities	Internships, hackathons, laboratory sessions, industrial visits, and community service projects engage students beyond academic instruction
Project-Based Participation	Mini-projects, capstone design, and research projects build sustained engagement with complex, multi-disciplinary engineering challenges
Peer and Collaborative Learning	Group activities, seminars, team-based projects, and peer assessments foster collaborative academic engagement and communication skills
Faculty Mentoring	Analytics-informed identification of low-engagement students enables timely academic support and personalized mentoring interventions

8.2 Monitoring and Follow-up

Responsibility	Frequency	Action
Faculty	Daily	Review ELRV completion dashboards; identify non-completions; inform classroom instruction with gap data
Class In-Charge	Weekly	Follow up with students showing low engagement; maintain engagement records and escalate to HOD
HOD	Monthly	Review department-level analytics; ensure faculty content schedules; address persistent low participation
Dean – TIPS	Periodic	Review institution-wide metrics; align analytics with PMCS; make policy and platform decisions

Continuous assessment at IARE is embedded across all pedagogical activities to ensure that student learning is regularly monitored, evaluated, and reinforced. The integration of learning analytics through the Edpuzzle platform enables faculty and academic administrators to make data-driven decisions that improve instructional effectiveness, identify learning gaps, and support timely student interventions.

9.1 Assessment Framework

Assessment Component	Description
Formative Assessment	In-video MCQ assessments within ELRV sessions provide continuous, in-context evaluation of student comprehension during content engagement
Cumulative ELRV Score	Semester-wide aggregate of all ELRV session scores enables longitudinal tracking of student academic engagement and performance trends
Mid-Semester Tests	Formal assessments at mid-semester directly mapped to Course Outcome attainment and informed by ELRV analytics data
End-Semester Examination	Comprehensive summative assessment aligned with PO attainment; informed by continuous monitoring and formative data throughout the semester
Project Evaluations	Assessment of project-based learning outcomes mapped to higher-order Bloom's Taxonomy levels including analysis, synthesis, and evaluation

9.2 Learning Analytics Parameters

Analytics Parameter	Academic Purpose
Completion Status	Tracks whether each student has fully completed the assigned ELRV video within the stipulated deadline
Watch Time	Total duration a student engaged with session content, indicating actual learning investment and seriousness
MCQ Participation	Number of in-video assessment questions attempted; reflects student engagement with formative evaluation
Topic-wise Scores	Grade obtained per topic or session assigned; enables course-level and concept-level performance mapping
Cumulative Score	Aggregate performance across all ELRV sessions; used for semester-level engagement and progression reporting
Completion Percentage	Proportion of assigned videos completed; primary engagement metric for departmental and institutional reporting

9.3 Continuous Improvement Cycle

Analytics-Driven Continuous Improvement

- ✓ Student performance and completion data collected through Edpuzzle analytics dashboards
- ✓ Faculty identify learning gaps at topic and concept level through analytics review
- ✓ Classroom instruction is adjusted to reinforce areas of low comprehension identified by ELRV data
- ✓ Low-performing or non-completing students receive targeted academic intervention and mentoring
- ✓ ELRV content is revised and updated based on student performance trends and curriculum changes
- ✓ Aggregated analytics inform departmental and institutional curriculum review decisions
- ✓ Annual IQAC review of TIPS initiatives drives policy-level continuous improvement

The TIPS framework at IARE is supported by a robust digital infrastructure comprising academic platforms, content delivery systems, analytics tools, and production facilities. These platforms collectively enable the deployment, monitoring, and continuous improvement of all TIPS digital learning initiatives.

Platform / Tool	Academic Function	Scope
Edpuzzle	Primary ELRV delivery and analytics platform; supports video hosting, MCQ embedding, real-time dashboards, and student monitoring	Academic-wide ELRV deployment across all 11 departments
Akanksha Portal	Institutional Learning Management System (LMS); hosts course content, What You'll Learn modules, assessment resources, and student progress records	All courses across all semesters
SWAYAM / NPTEL	National digital learning platforms providing supplementary certification courses and advanced academic content	Student self-learning and certification
ExEED Platform	Industry-partnered digital learning platform for professional skill development and employability enhancement programmes	Professional competency development
ICT Studios	Dedicated video recording and content production facilities for ELRV and CLRV content creation; operated by trained technical staff	Faculty ELRV content production
Specialized Software	STAAD Pro (Bentley), ANSYS-CFD, AutoCAD, and domain-specific tools integrated into laboratory and project learning	Engineering design and research

The TIPS framework has generated measurable academic impact across IARE's student population, faculty community, and institutional quality indicators. The outcomes documented below reflect the effectiveness of HyFlex Learning, ELRV deployment, multi-modal pedagogical practices, and structured monitoring systems implemented under the TIPS framework.

11.1 Student Learning Outcomes

Key Academic Outcomes for Students

- ✓ Enhanced conceptual understanding through repeated self-paced ELRV video access and in-video MCQ reinforcement
- ✓ Development of continuous and independent learning habits aligned with lifelong learning competencies
- ✓ Improved readiness for formal mid-semester and end-semester assessments through embedded formative practice
- ✓ Strengthened Course Outcome (CO) and Program Outcome (PO) attainment evidenced through analytics data
- ✓ Alignment with 21st-century digital learning, critical thinking, and professional communication competencies
- ✓ Enhanced employability through experiential learning, project-based activities, and skill development programmes

11.2 Institutional Outcomes

Key Institutional Achievements Through TIPS

- ✓ Scalable technology-enabled academic monitoring infrastructure operational across all 11 departments
- ✓ Structured, timestamped, analytics-backed evidence of student engagement generated for accreditation purposes
- ✓ Data-driven decision-making culture established for faculty development and curriculum quality improvement
- ✓ Continuous quality improvement cycles aligned with NAAC A++, NBA Tier-I, and IQAC mandates
- ✓ Faculty digital pedagogy competencies significantly enhanced through TIPS training programmes
- ✓ Institutional innovation culture reinforced through national-level student achievements in hackathons and competitions

11.3 TIPS Pedagogy-Outcome Alignment

Pedagogy	Primary Outcome	Evidence Source
Subject-Based Learning (ELRV)	Course Outcome Attainment, Conceptual Mastery	Edpuzzle Analytics, CO Reports
Experiential Learning	Industry Readiness, Skill Application	Internship Reports, Industrial Visit Records
Project-Based Learning	Complex Problem Solving, Design Thinking	Capstone Evaluations, Research Publications
Collaborative Learning	Teamwork, Communication	Group Assessment Records, Peer Evaluations
Case-Based Learning	Critical Thinking, Contextual Analysis	Scenario Assessment Scores, MCQ Performance
Entrepreneurially Minded Learning	Innovation, Entrepreneurship	Hackathon Awards, Patent Records, Startups

The TIPS framework at IARE is fundamentally oriented toward producing engineering graduates who are not merely academically proficient but professionally competent, industry-ready, and future-focused. Curriculum mapping to industry domains, deployment of emerging technology content through ELRV, and structured experiential learning initiatives collectively ensure that students develop competencies aligned with the expectations of modern engineering industries.

12.1 Industry-Aligned Initiatives Under TIPS

TIPS Initiative	Industry Alignment Description
Curriculum Mapping to Job Roles	All TIPS initiatives include explicit mapping of learning content to industry job roles and professional competency frameworks under the SBL methodology
Summer ELRV Technology Courses	AI Foundations, Java Full Stack, Web Systems Engineering, and other emerging technology ELRV courses directly enhance student employability
SkillUP / SkillNext / SkillBridge	Structured industry skill development programmes bridging the gap between academic learning and professional practice requirements
Hackathons and Innovation Competitions	National-level MSME Idea Hackathon and institutional innovation challenges provide students with industry-relevant problem-solving experience
Industry Integration in Teaching	Faculty integrate industry examples, professional case studies, and emerging trends into ELRV content and classroom delivery
Capstone and Research Projects	Final year capstone projects are aligned with real-world engineering problems in consultation with industry partners and faculty researchers

12.2 BT-25 Curriculum Highlights Aligned with Industry

BT-25 Course / Initiative	Industry Alignment
AI Tools for Civil Engineering (Sem VI)	Dedicated course introducing AI applications in engineering practice, aligned with digital transformation trends in industry
BIM Laboratory (Sem V)	Building Information Modelling practical course aligned with global construction industry digital design standards
GIS Laboratory (Sem VII)	Geographic Information Systems laboratory aligned with urban planning, infrastructure, and geospatial industry requirements
Data Analytics in Civil Engineering	Professional elective on data analytics methodologies applied to engineering datasets and infrastructure systems
Capstone Project (14 Credits, Sem VIII)	Comprehensive multi-disciplinary engineering design project addressing real-world industry challenges

The following key findings summarize the achievements, outcomes, and institutional impact of the Teaching Innovation & Pedagogical Support (TIPS) framework at IARE during the Academic Year 2025–26. These findings are presented as a strategic evidence summary for academic administrators, IQAC members, and accreditation evaluators.

S.No	Finding Domain	Key Finding
01	Pedagogical Integration	TIPS successfully deploys six structured pedagogical methodologies — SBL, EL, PBL, ACL, CBL, and EML — across all 11 departments, ensuring comprehensive coverage of diverse learning approaches throughout B.Tech programmes.
02	HyFlex Learning	The HyFlex Learning initiative provides students with structured, flexible, and analytics-monitored access to curriculum content through the Edpuzzle platform, achieving consistent engagement across multiple semesters and departments.
03	ELRV Effectiveness	ELRV sessions demonstrate high completion rates with embedded MCQ assessments reinforcing conceptual understanding. Faculty report improved classroom discussion quality in courses supported by active ELRV deployment.
04	Student Engagement	Multi-channel engagement through ELRV, Akanksha Portal, experiential activities, and project-based learning ensures sustained academic participation beyond formal classroom contact hours across all student batches.
05	Outcome Attainment	Systematic CO-PO mapping of all ELRV content and pedagogical activities generates structured, evidence-based documentation of Course and Program Outcome attainment aligned with OBE and NBA requirements.
06	Formative Assessment	Integration of embedded MCQ assessments within ELRV sessions and continuous mid-semester monitoring provides faculty with actionable data for timely academic intervention and student support.
07	Digital Learning Infrastructure	Institutional deployment of Edpuzzle, Akanksha Portal, ICT Studios, and specialized engineering software establishes a robust, scalable digital learning infrastructure supporting all TIPS initiatives.
08	Faculty Development	TIPS-led faculty training in digital content creation, analytics interpretation, and evidence-based instructional design has measurably improved faculty digital pedagogy competencies across all departments.
09	Innovation and Employability	Student participation in MSME Idea Hackathon 5.0 and other innovation competitions demonstrates the effectiveness of EML and PBL methodologies in building creativity, professional initiative, and real-world problem-solving skills.
10	Accreditation Readiness	The TIPS framework generates comprehensive, structured evidence — including timestamped analytics, CO attainment reports, engagement records, and faculty development documentation — directly supporting NAAC A++ and NBA Tier-I accreditation requirements.
11	Summer Learning Continuity	Summer ELRV programmes covering AI Foundations, Java Full Stack, Web Systems Engineering, and other domains ensure academic continuity during non-teaching periods and enhance student employability readiness.

12	Continuous Improvement	Analytics-driven content revision, faculty mentoring cycles, and annual IQAC reviews demonstrate an active, evidence-based continuous improvement ecosystem aligned with institutional quality mandates.
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The Teaching Innovation & Pedagogical Support (TIPS) framework at IARE has demonstrated its effectiveness as a comprehensive institutional mechanism for advancing teaching quality, student engagement, outcome attainment, and academic excellence. Through the disciplined integration of multi-modal pedagogical methodologies, technology-enabled learning platforms, structured monitoring systems, and continuous improvement cycles, TIPS has established IARE as an institution where every teaching-learning interaction is purposeful, evidence-based, and student-centered.

The HyFlex Learning initiative and ELRV programme have created a scalable digital academic ecosystem that enables flexible, continuous, and analytics-monitored student engagement beyond the confines of conventional instruction. Faculty, empowered through training and institutional support, have emerged as both educators and innovators — contributing to a culture of pedagogical excellence that aligns fully with NAAC A++, NBA Tier-I, NEP 2020, and OBE standards.

14.1 Way Forward

Way Forward Initiative	Target & Action
ELRV Scale-Up	Achieve 100% ELRV content coverage across all courses and semesters by AY 2027–28
AI-Powered Analytics	Integrate AI-based predictive analytics for early identification of academically at-risk students
Cross-Department Content Sharing	Build an institutional ELRV content repository enabling cross-department resource sharing and peer review
Student-Generated Content	Pilot student-contributed supplementary learning resources as an advanced engagement initiative
International Benchmarking	Benchmark TIPS practices against international engineering education standards and global best practices
Research and Publication	Document and publish TIPS pedagogical outcomes in peer-reviewed educational research journals
Industry Content Integration	Incorporate industry-contributed content and real-world case studies into the ELRV content library
Faculty Recognition Programme	Establish structured recognition and incentive mechanisms for faculty demonstrating ELRV and TIPS excellence

***"Learn Continuously. Think Critically. Innovate
Confidently. Succeed Meaningfully."***

PLAN • INNOVATE • ENGAGE • MONITOR • IMPROVE • SUCCEED

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