

AI as Academic Copilot

For Teaching, Research, Administration and Institutional Transformation

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భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Why This Talk?

3 Years Ago

"Can ChatGPT write code?"

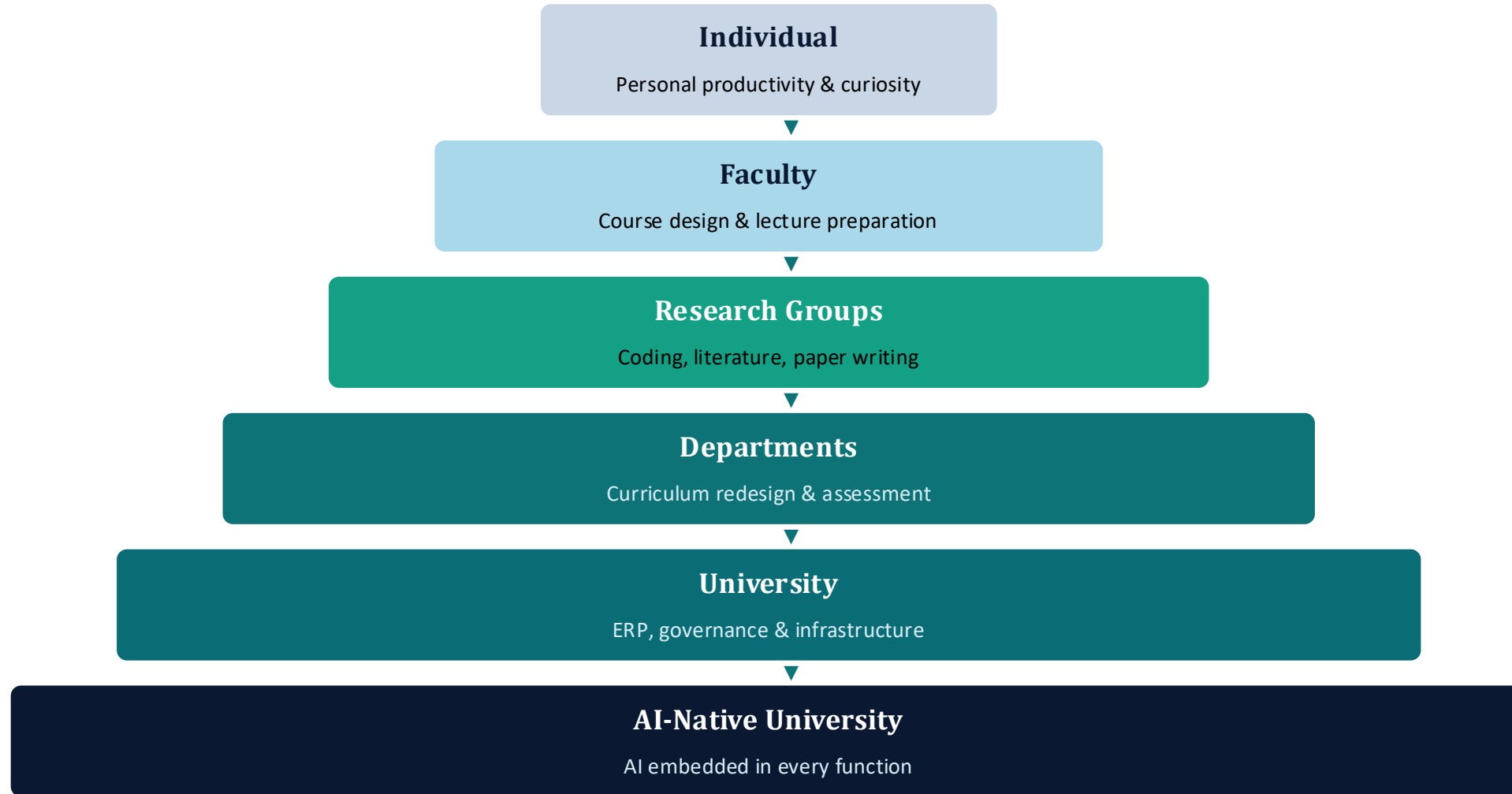
The individual curiosity phase

Today

"How do we redesign _____ with AI?"

The institutional transformation phase

The AI Maturity Journey in Academia



PART I

Teaching

Case Studies in AI-Augmented Pedagogy

The Traditional Teaching Process



Slides/Lecture Material



Assignments



Grading



Quizzes/exams



Rubrics



Feedback

AI dramatically reduces repetitive load — freeing time for what matters: mentoring and deep engagement.

Designing Courses with AI

Courses Redesigned (Partially)

- Advanced Computer Networks
- Network Security
- Network Security
- Wireless Networks & Security

Slides/Lecture Material

Saves search time

Assignment and Project Design

Open-ended, real-world problems with rubrics auto-drafted and refined

Rubric Creation

Consistent evaluation criteria across projects and open-book exams

Giving Students Harder, More Ambitious Projects

BEFORE AI

- Simple socket programming tasks
- Toy implementations — no real scale
- Easy, templated deliverables
- Limited research connection
- Implementation was the bottleneck

WITH AI

- OpenAirInterface / srsRAN / xApp development
- Near-RT RIC implementations in O-RAN
- WebRTC / QUIC performance analysis
- Digital twin prototyping
- Real research-grade deliverables

Key Insight: AI lowers the implementation barrier — students can attempt research-grade problems that were previously unreachable in a semester.

Assessment: LLM-as-Judge — What Didn't Work

✗ LLM-as-Grader: Failed

- ✗ Inconsistent scores across runs
- ✗ Hallucinated technical reasoning
- ✗ Missed originality & insight
- ✗ Weak on mathematical rigor
- ✗ Students could reverse-engineer grades

✓ Viva Voce: The Answer

- ✓ Cannot be AI-generated in real time
- ✓ Tests understanding, not output
- ✓ Reveals depth vs. surface knowledge
- ✓ Adaptive — follow up on weak points
- ✓ Builds oral communication skills

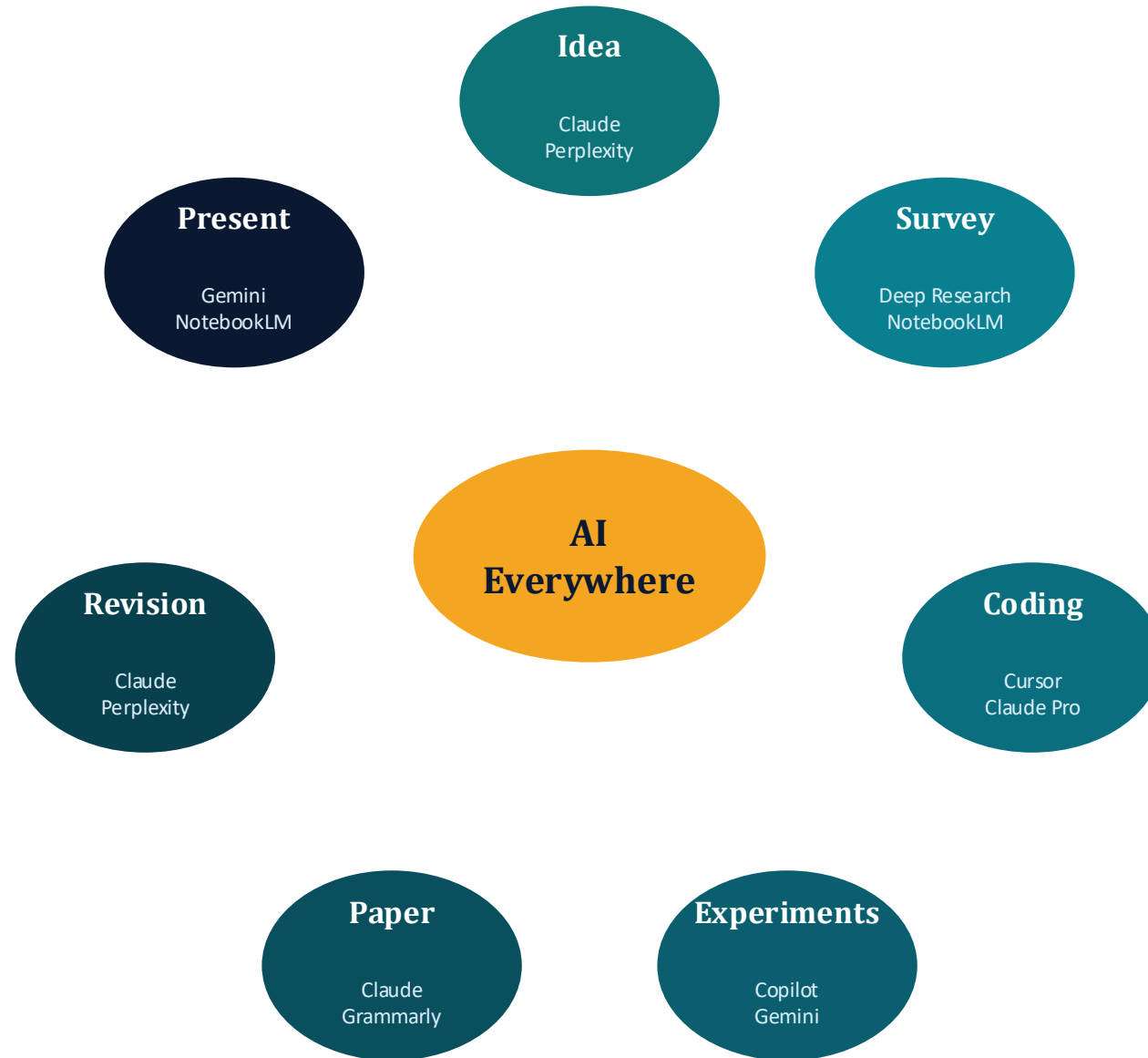
Shift in assessment philosophy: Reports tell you what AI can produce. Conversations tell you what the student understands.

PART II

Research

Case Studies in AI-Accelerated Discovery

AI Across the Research Lifecycle



Literature Survey: From Weeks to Hours

Deep Research

100+ paper synthesis in one prompt. Generates structured literature reviews with citations.

NotebookLM

Upload 20 PDFs → podcast-style summaries, gap analysis, cross-paper Q&A.

 Always verify: AI-generated citations can be fabricated. Cross-check every reference before submission.

Coding: PhD Students with AI Pair Programmers

Claude Pro

OpenAirInterface
(OAI)

srsRAN

xApps

Near-RT RIC
(O-RAN)

10×

Faster prototyping

vs. without AI assistance

70%

Less time on boilerplate

More time on research logic

1 sem

PhD-grade demos

Previously took 1–2 years

Writing: AI Across Every Document Type

Research Papers

Drafts, structuring arguments, revision responses to reviewers

Grant Proposals

Problem statements, impact sections, budget justifications

Governance Docs

ToR templates, SOP drafts, committee reports, DPGC documents

Emails & Comms

Executive-level emails, MoMs, vendor communications

Presentations

Outline to slide structure in minutes; speaker notes auto-generated

Policy Documents

Vision roadmaps, digital transformation strategy docs

PART III

Administration & Digital Transformation

DISHA ERP: AI-Accelerated Enterprise Development

DISHA Modules

- Hostel Management
- HR / APAR Workflows
- Asset Management
- Digital Governance
- Campus Automation
- LMS Integration
- Google Workspace

AI Tools Used

Cursor + Claude → Rapid ERP module prototyping
Natural language → code → working module in weeks, not months



Development Speed

Before: Months

After: Weeks



Documentation

Before: Manual

After: AI-Drafted



Policy Drafts

Before: 2–3 weeks

After: Hours

AI for Inclusion: Multilingual Classroom Translation

English Lecture

↓ Speech-to-Speech AI ↓

Hindi

Telugu

Tamil

Kannada

Bengali

Offline · On-device · No data leaves the campus

Impact: Students from non-English backgrounds participate more actively. First-generation college students benefit most.

AI for inclusion — not just productivity.

PART IV

Reality Check

What AI Gets Wrong — and Why That Matters

Hallucinations: Real Examples from Academic Work

✗ Fake Citations

Papers that don't exist, DOIs that resolve to different articles, authors misattributed.

Lesson: Never submit a reference without independently verifying it.

✗ Wrong Equations

Plausible-looking mathematical expressions that are technically incorrect — especially in signal processing.

Lesson: AI reasons well but calculates badly. Always verify maths.

✗ Fabricated Facts

Incorrect protocol specifications, wrong RFC numbers, fabricated statistics in domain-specific content.

Lesson: Domain-specific claims need domain-expert verification.

Privacy Concerns

- X Student personal data
- X Confidential research data
- X Peer review materials
- X Committee deliberations
- X Vendor contracts & pricing
- X HR / APAR records

- *Never upload to public AI APIs without anonymization.*
- *DPDPA 2023 compliance is non-negotiable.*

Academic Integrity: The AI Sandwich Model



<https://onlinelearningconsortium.org/olc-insights/2026/01/the-ai-sandwich/>

PART V

Future

Where We Are Going: AI-Native Universities

Next Frontier: Agents and Automated Workflows



Research Agent

Survey → synthesize → Digest. Autonomous literature monitoring.



Teaching Agent

Auto-generates quiz questions, grades MCQs, sends personalized feedback to students.



Automation Agent

Triggers workflows, sends reminders, escalates approvals, generates compliance reports.



Cyber Security Agent

Monitors 200+ websites, correlates Wazuh alerts, escalates to humans for authorization.

The AI-Powered Digital Transformation

T

Teaching

Personalized, adaptive, AI-co-designed curricula

R

Research

Agents + humans collaborating on discovery

A

Administration

ERP, governance, compliance — AI-automated

C

Campus infra

Smart labs, energy, security — AI-monitored

L

Libraries

AI-curated, discovery-first, multilingual

S

Student Services

24/7 AI advisor, placement, wellness

Ten Lessons Learned

1 Experiment early — the learning curve is steep but fast

3 Think before prompting — clarity in = quality out

5 Declare AI usage — normalize it like citing software, paper

7 AI is excellent for brainstorming; weak for blind trust

9 Privacy is non-negotiable — know your red lines

2 Verify everything — AI is a brilliant but unreliable collaborator

4 Use AI for productivity, never for bypassing thinking

6 Viva matters more than reports in the AI era

8 Invest in institutional AI — personal tools aren't enough

10 Keep humans accountable — AI assists, people decide!

Recommendations

For Faculty

1. Start with one course — redesign it with AI
2. Mandate AI usage declarations in submissions
3. Adopt the AI Sandwich as your integrity framework
4. Use NotebookLM for lecture preparation

For Students

1. Learn to prompt well — it's a very important skill
2. Use AI to attempt harder problems, not easier ones
3. Never submit without verifying AI output
4. Declare every AI tool you used, always

For Universities

1. Invest in enterprise AI licenses
2. Build a private AI model for sensitive data
3. Embed AI literacy in all programs
4. Treat AI governance as infrastructure, not IT policy

AI will not replace teachers, researchers or engineers.

But those who effectively collaborate with AI
will redefine teaching, research and innovation.

**It is not the strongest of the species that survives, nor the most
intelligent, but the one most responsive to change -- Darwin**

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