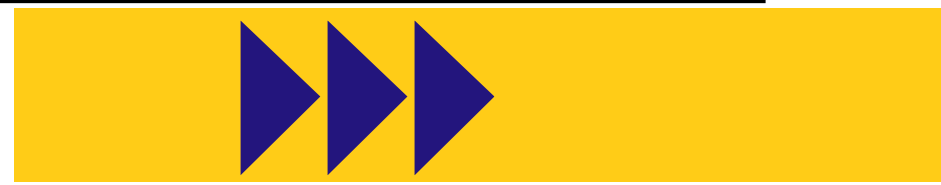
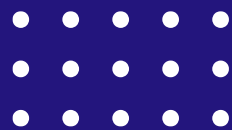
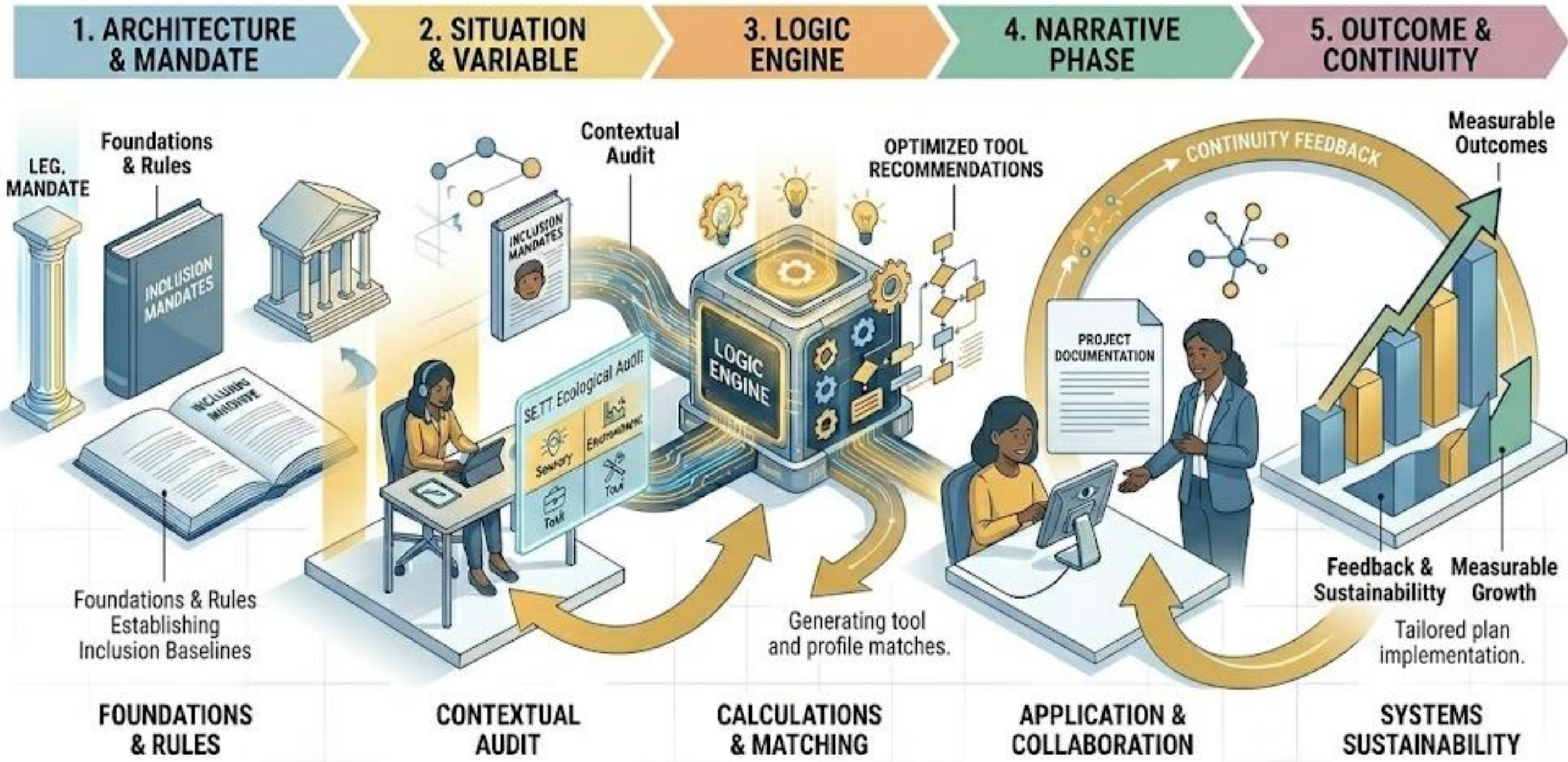
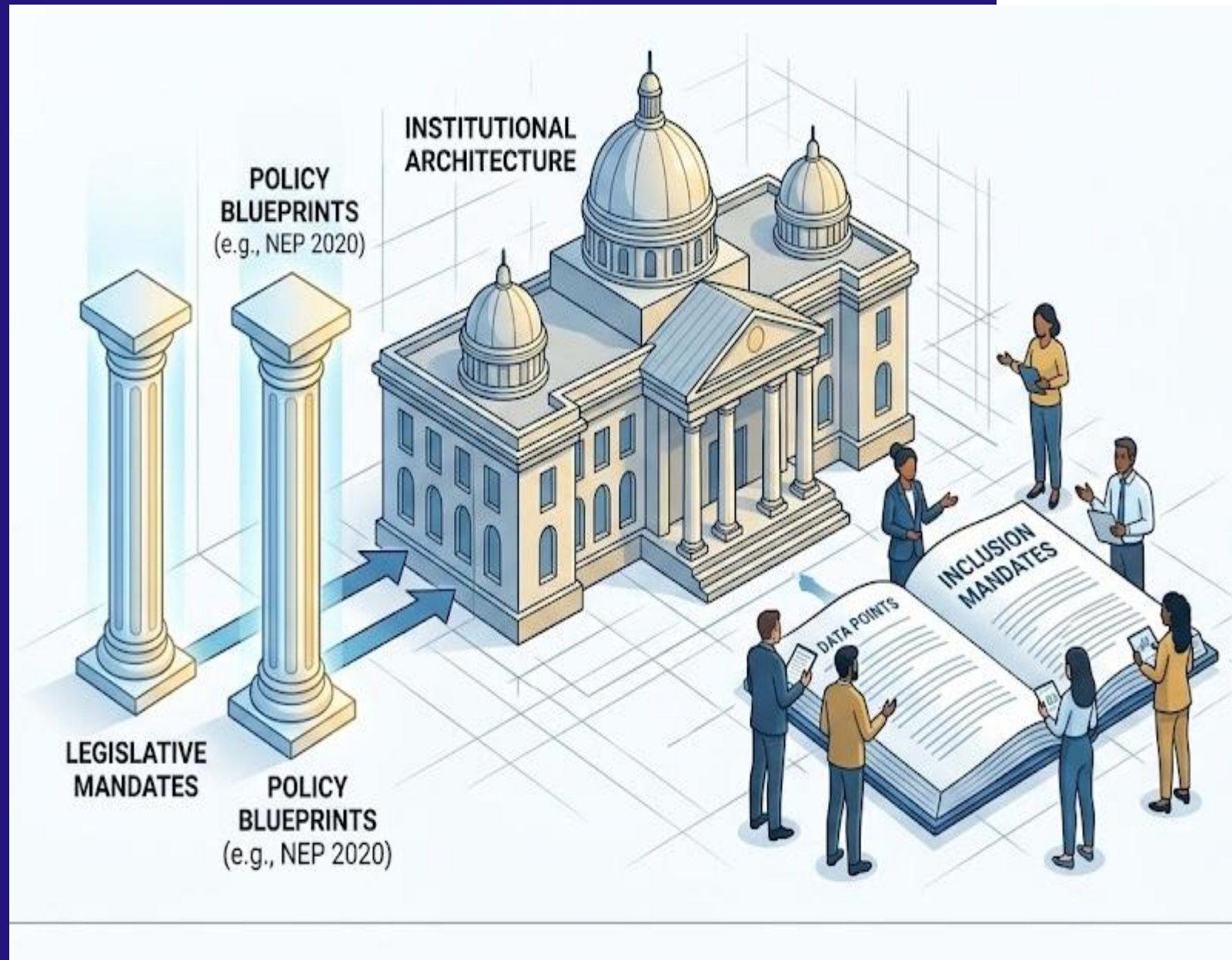
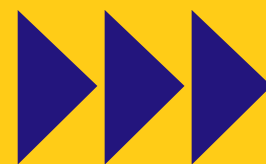
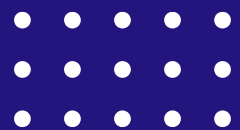


# Architecture of Inclusion: From Systemic Mandate to Individual Mastery





# Part I: Architecture & Mandate



# Framework of Pedagogical Equity

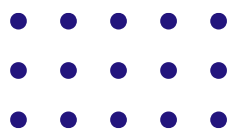
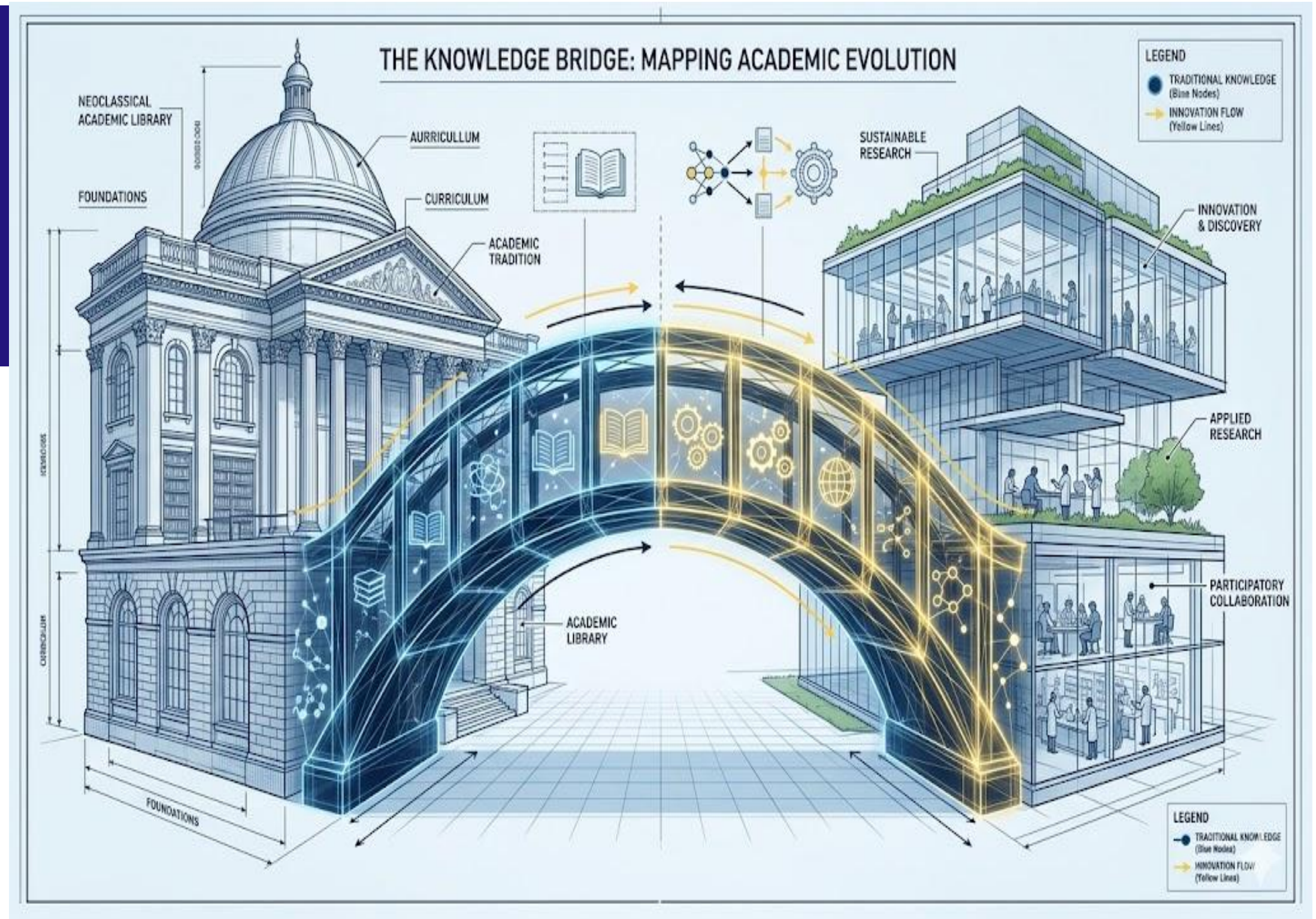
*We begin our inquiry not with technology, but with **Architecture** !!!*

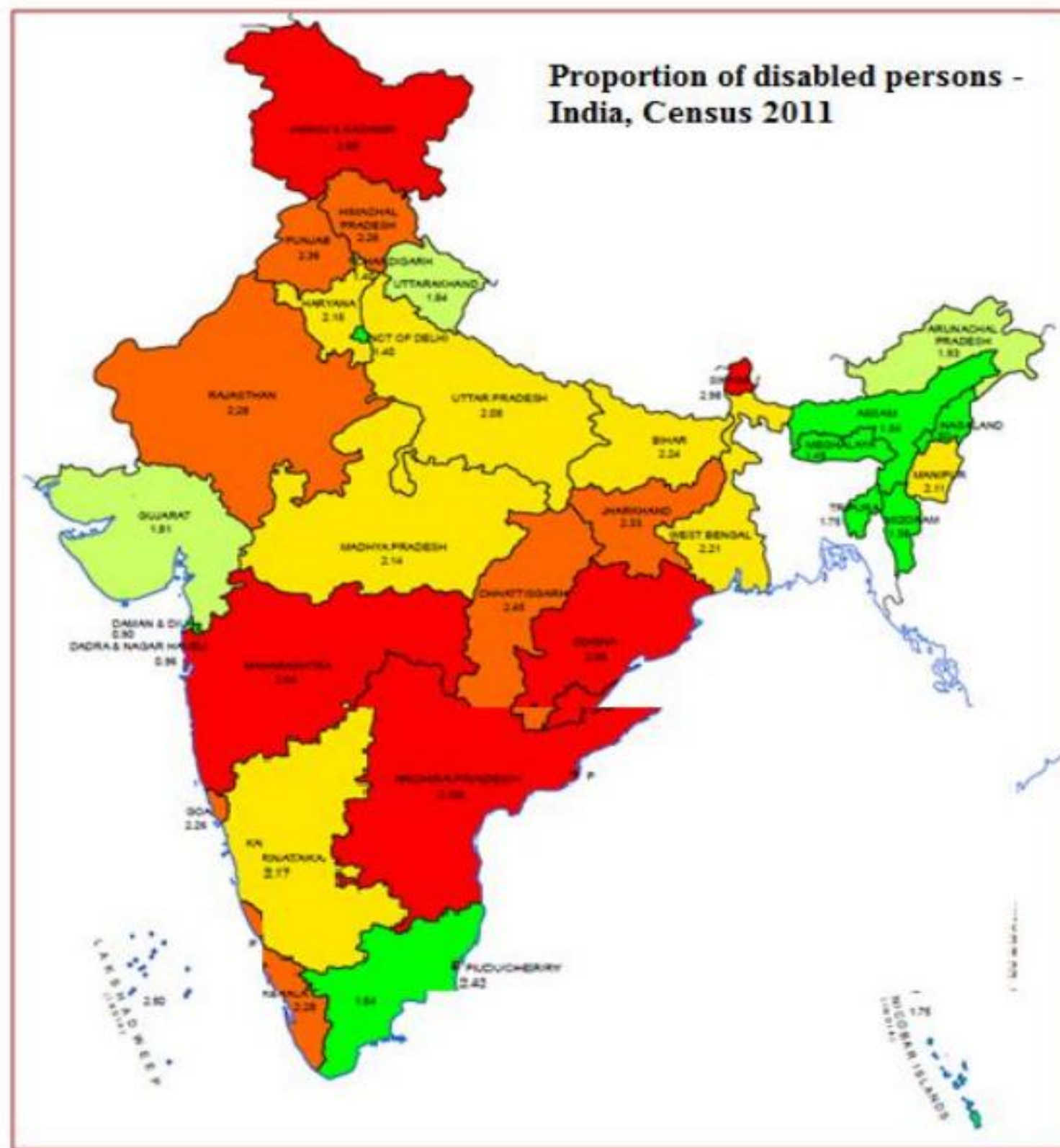
01

**Functional Synergy** in Inclusive Education.

02

**Synchronizing Learner** Profiles with Technological Modalities.

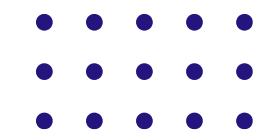
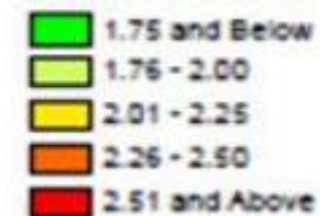




Approximately **2.21%** of the Indian population lives with disabilities.

Gross enrollment ratio in higher education remains **significantly lower** than the national average.

Percentage of Disabled Population to Total Population



## Demographic Imperative

- ▶ *Structural barriers necessitate **intentional pedagogical intervention** rather than passive accommodation.*

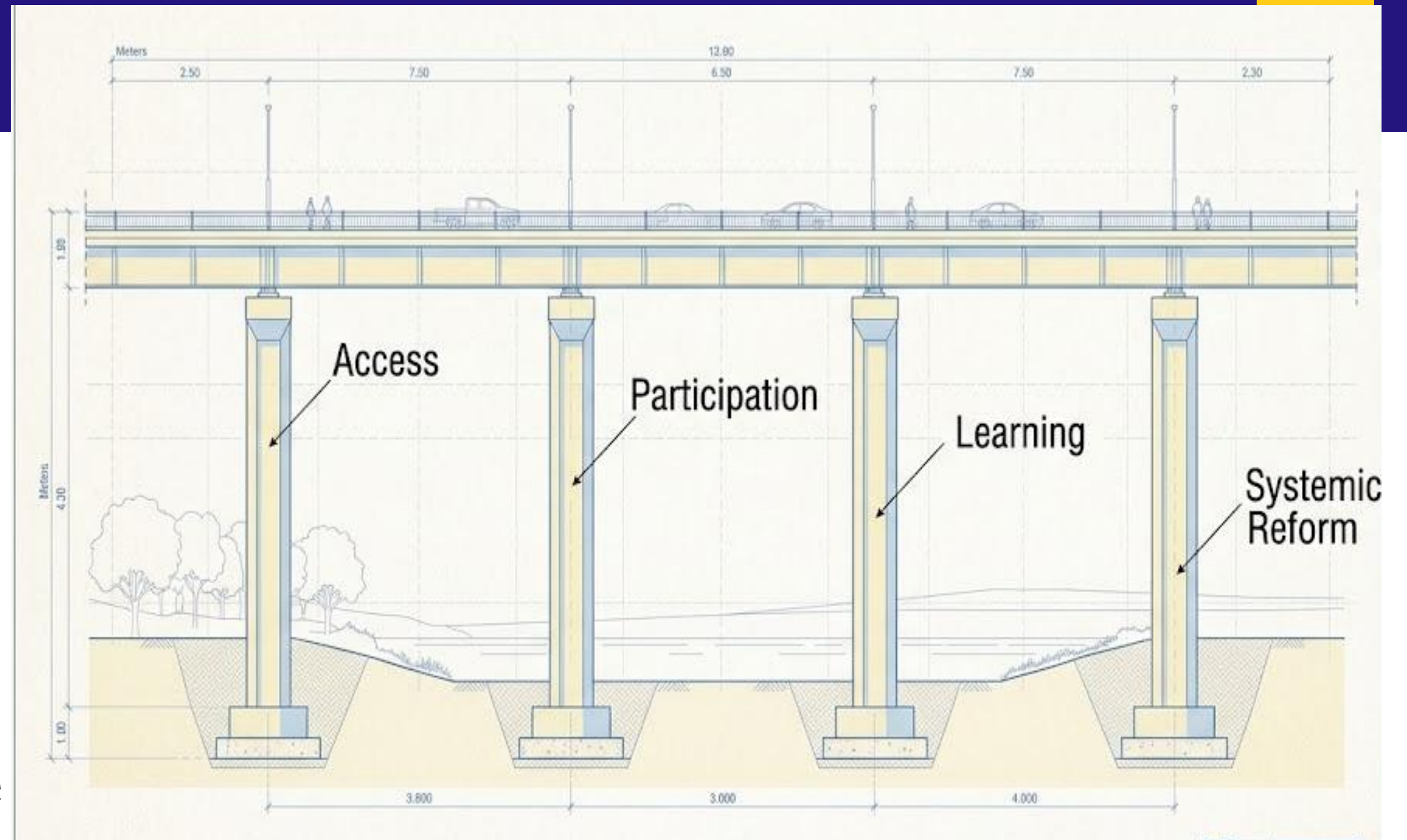


# Legislative Blueprint

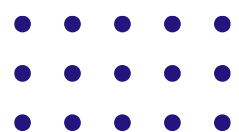
Section 16 of the RPwD Act 2016 mandates **"reasonable accommodation"**

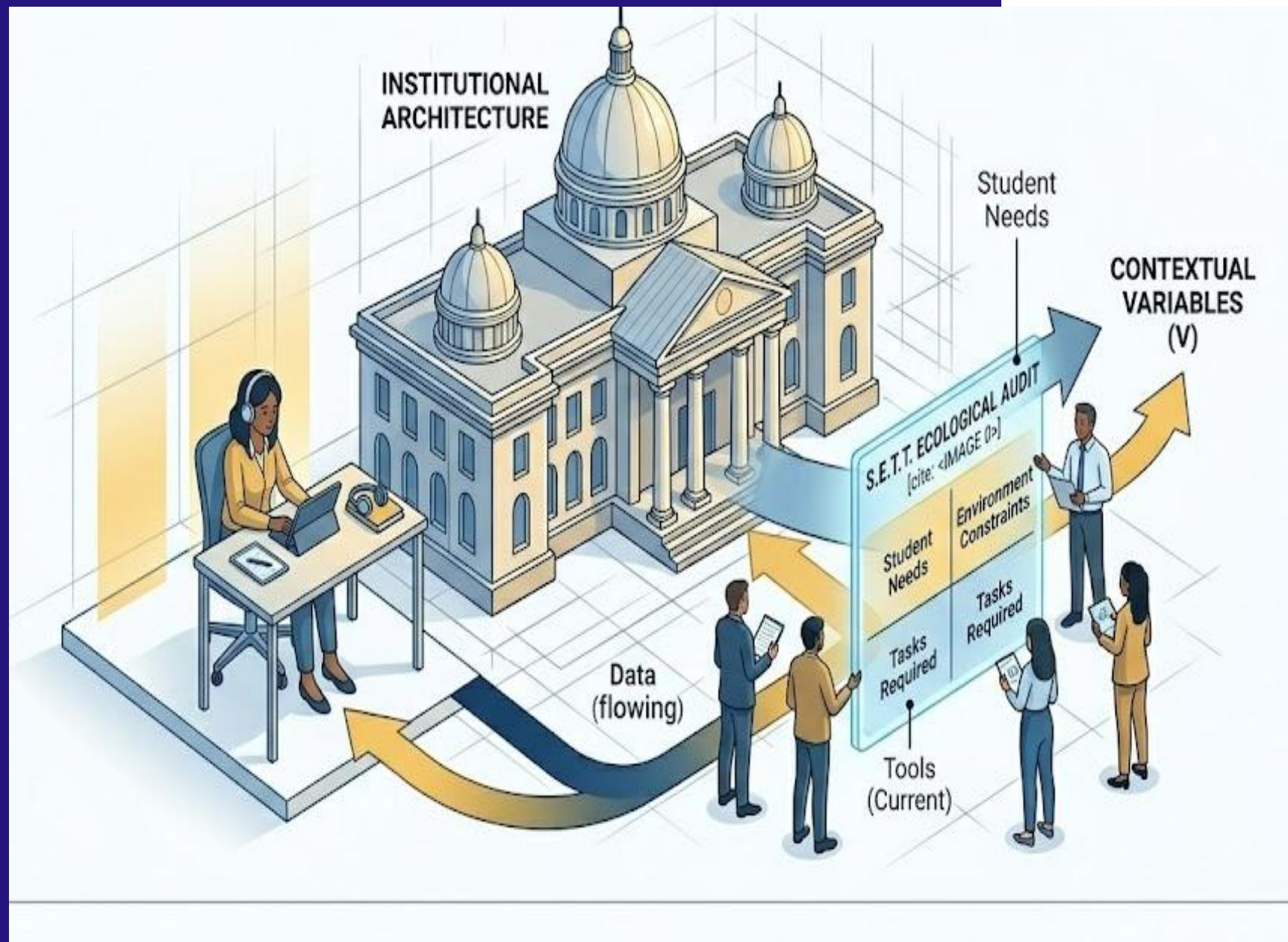
NEP 2020 envisions a 4-pillared approach to inclusion: **APLS**

**Transitioning** from "Ad-hoc support" to "Universal Design for Learning (UDL)."

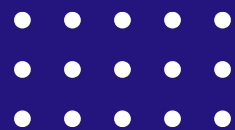


*We are moving toward a **default setting of accessibility**, ensuring it is a foundational ink rather than a retroactive post-script.*





# Part II: Situation & Variable



# Situation — Analyzing the Interface Gap



*Curriculum is traveling via a 'Visual-Only' or 'Text-Heavy' pipe that creates a barrier for learners whose functional character requires a **different entry point**.*

## 01 Accessibility Deficit

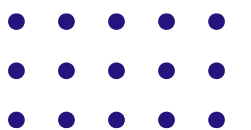
Over 90% of standard PDF resources are **technically inaccessible** to screen readers due to lack of tagging.

## 02 Observed Variable

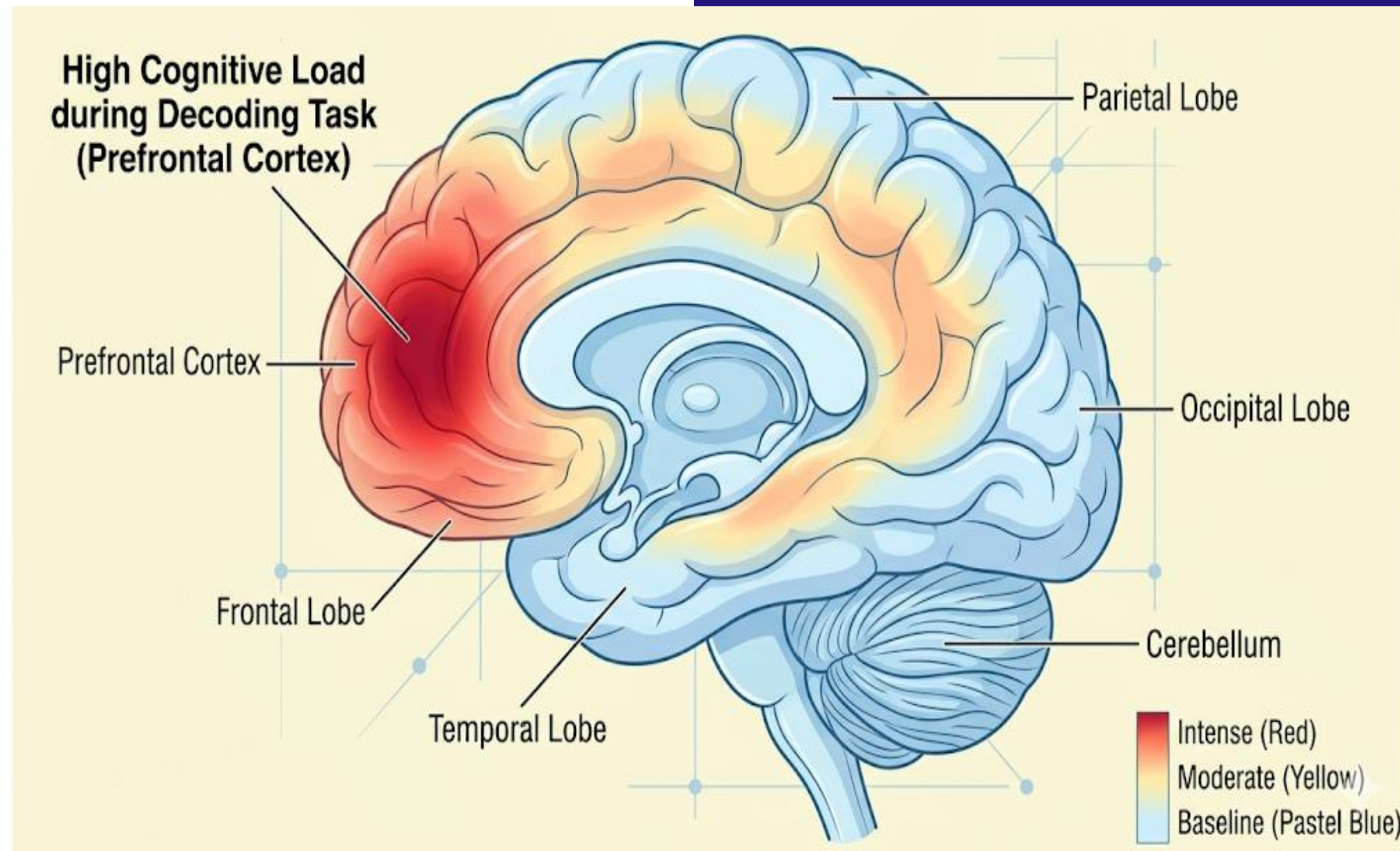
**"Interface Gap"** where delivery meets sensory/cognitive barriers.

## 03 Reality

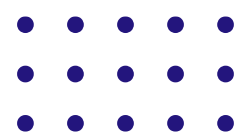
Information is present, but the access modality is **incompatible**.



# Barrier Hypothesis — Cognitive Load



*We are often **testing** struggle with the medium rather than the mastery of the material.*

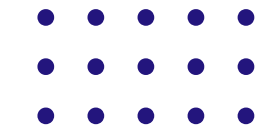


For a learner with dyslexia, decoding can consume up to **80%** of cognitive capacity.

**Minimal mental resources** remain for actual conceptual comprehension or critical analysis.

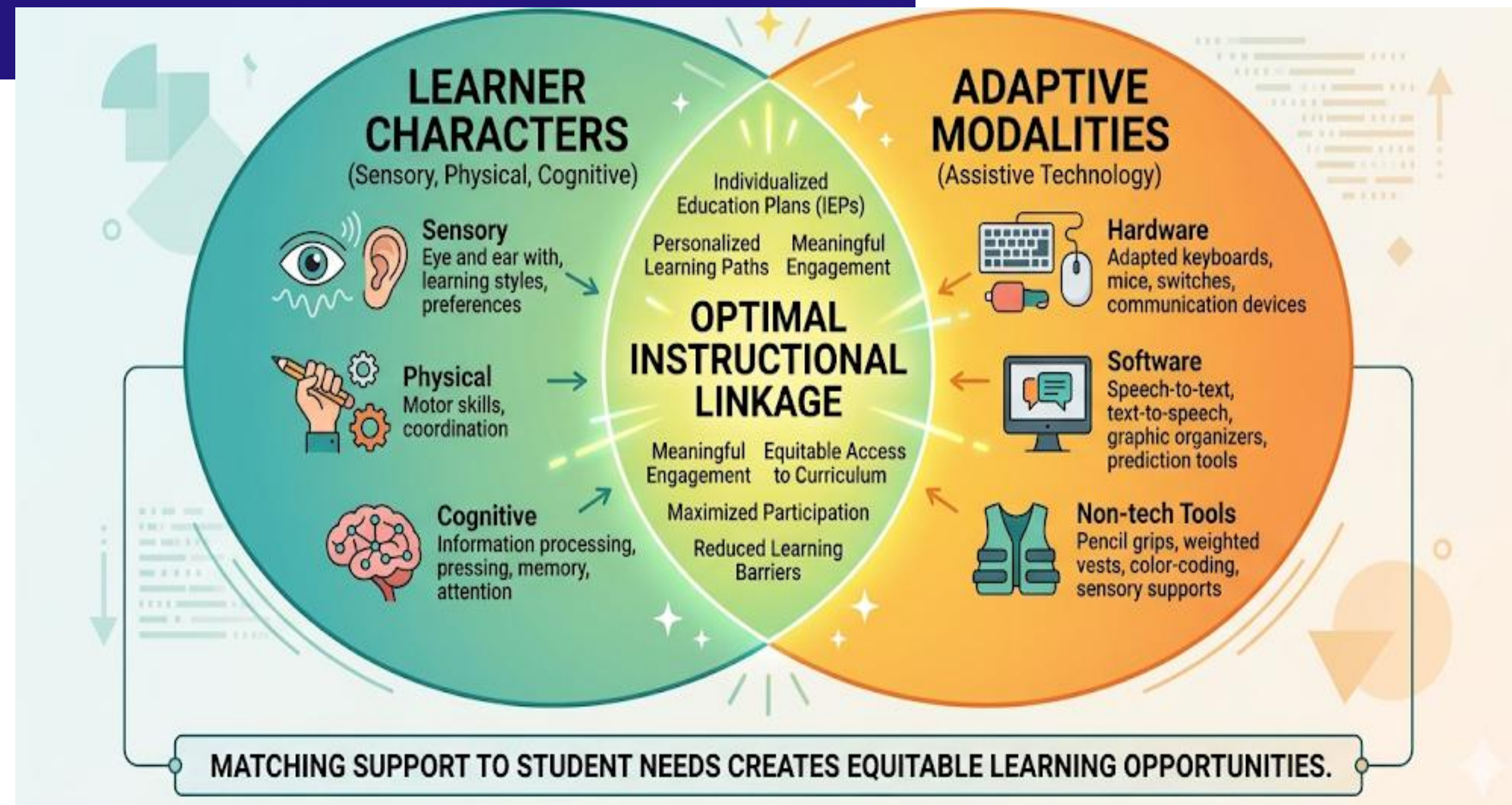
Medium of Delivery **vs.** Mode of Perception.

# Primary Variables — Functional Profiles



**Learner** (Sensory, Physical, Cognitive Processing Characters).

**Technology** (Adaptive Interfaces: Family of Apps & Devices).



# Variable Synergy — Engagement Metrics

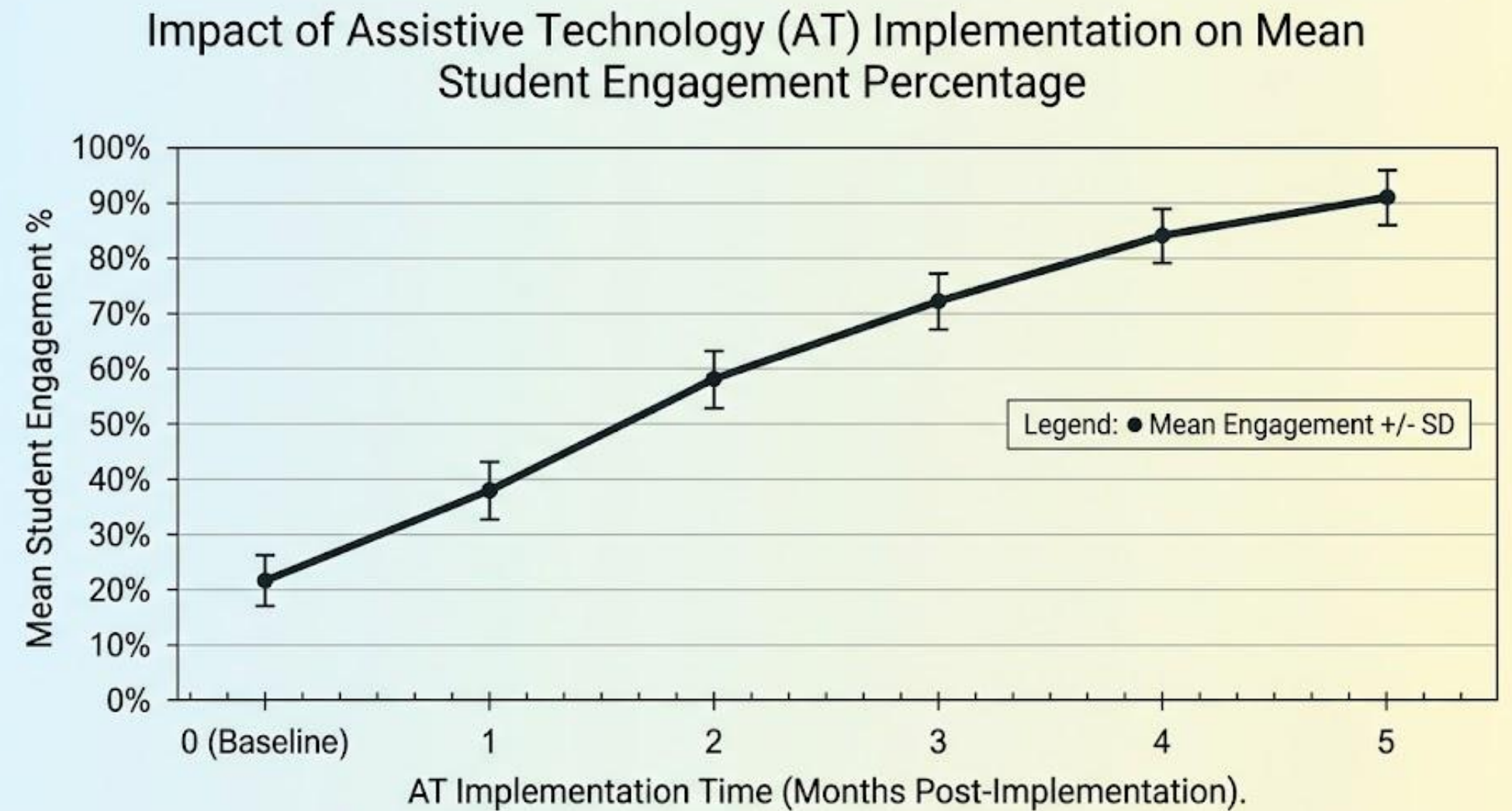


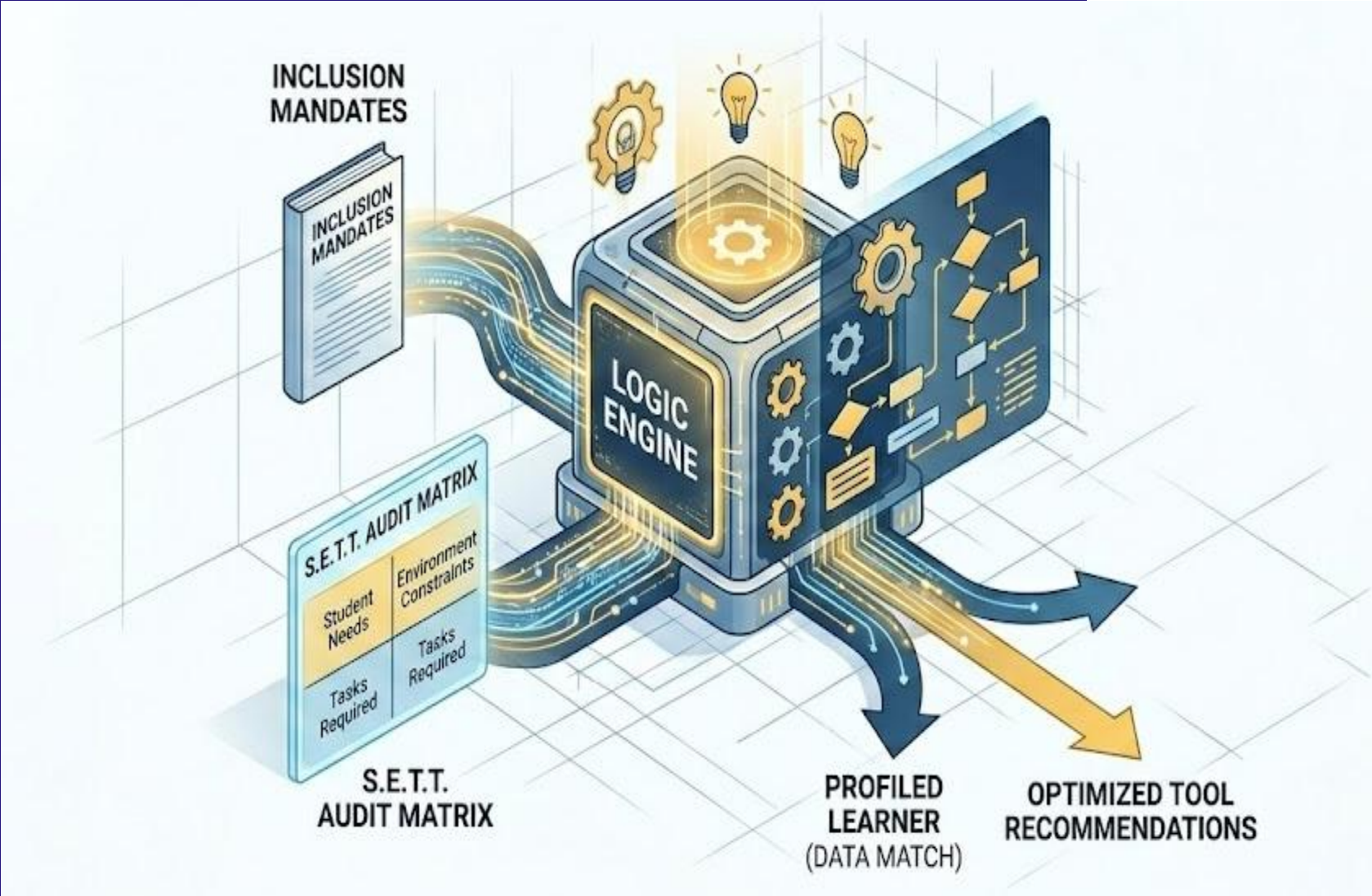
Figure 1: Mean student engagement (%) over a 6-month observation period.

01 Success is the **mathematical intersection** of User Capability (C) & Tool Functionality (F).

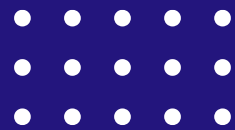
02 When **C≠F**, the learning outcome is  $\approx$  zero.

*AT: Assistive Technology*

Studies show an average **35-40%** increase in student engagement when AT is correctly mapped.



# Part III: Logic Engine



## S. STUDENT



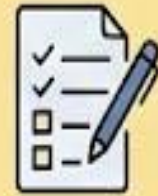
- Functional Area of Concern
- Needs & Challenges
- Current Abilities & Skills
- Interests & Preferences  
(Who is the learner?)

## E. ENVIRONMENT



- Physical Layout & Barriers
- Available Supports & Personnel
- Materials & Equipment (current)
- Attitudes & Expectations  
(Where will AT be used?)

## T. TASKS



- Specific Educational Tasks
- Required Activities in the Environment
- Gap between Student Abilities & Task Demands
- Critical Elements of Tasks  
(What does the student need to do?)

## T. TOOLS



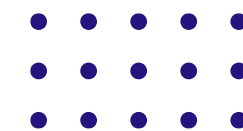
- Devices (no-tech, low-tech, high-tech)
- Services & Training
- Strategies & Modifications
- System of Tools Working in Combination  
(What features lower the barriers?)

# S.E.T.T Framework

*Thought process is governed by the **S.E.T.T Framework.***

80% of AT abandonment occurs because tools were selected **without context.**

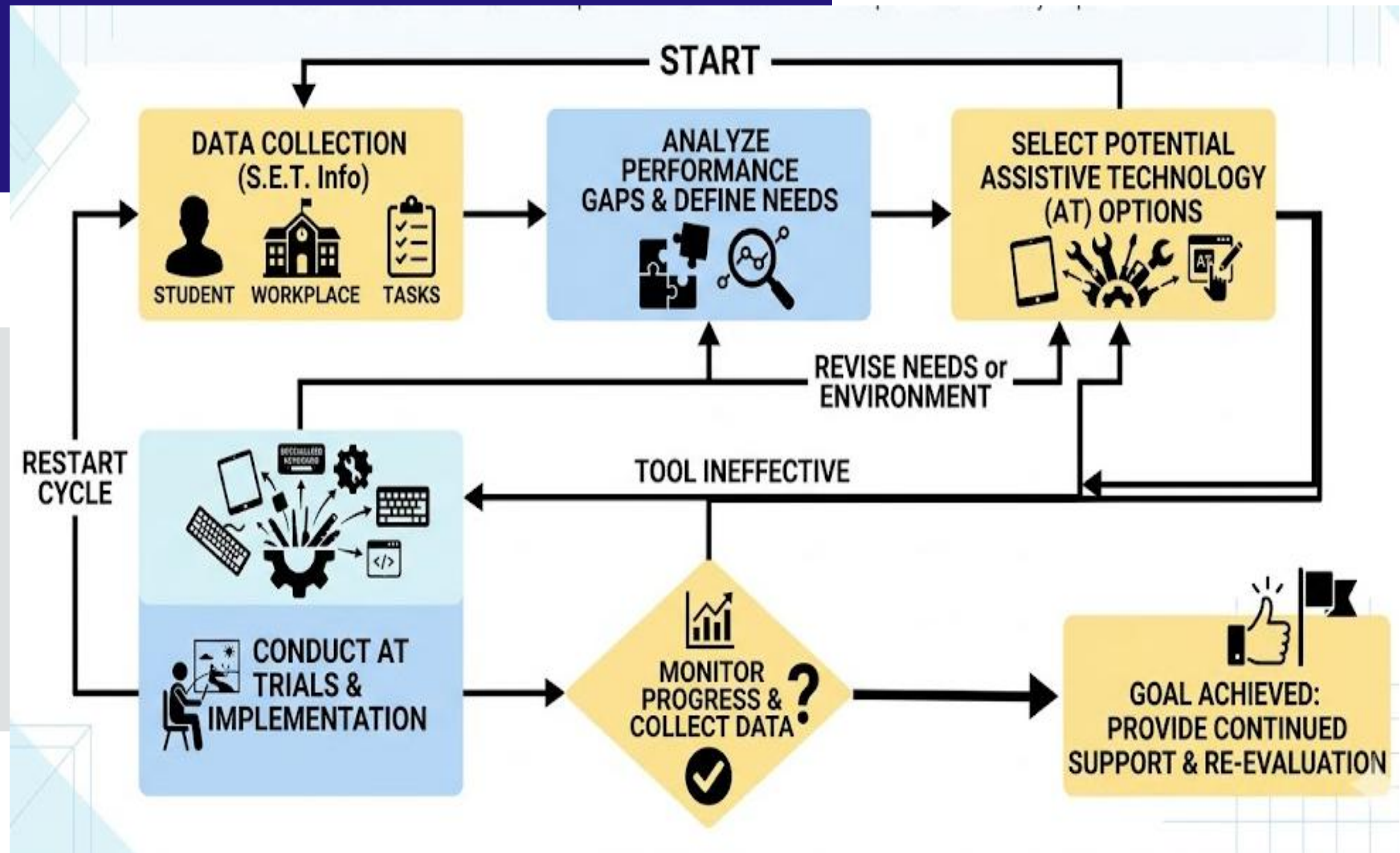
Aim for **Structural integrity** of the learning bridge.



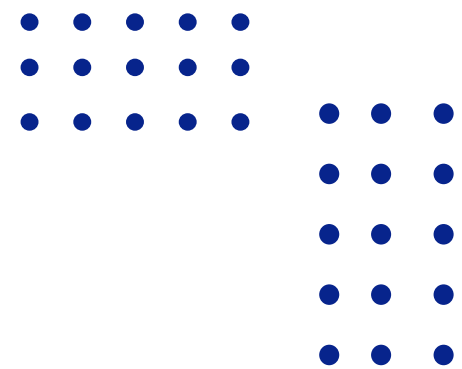
# SETT Protocol

## The Loop:

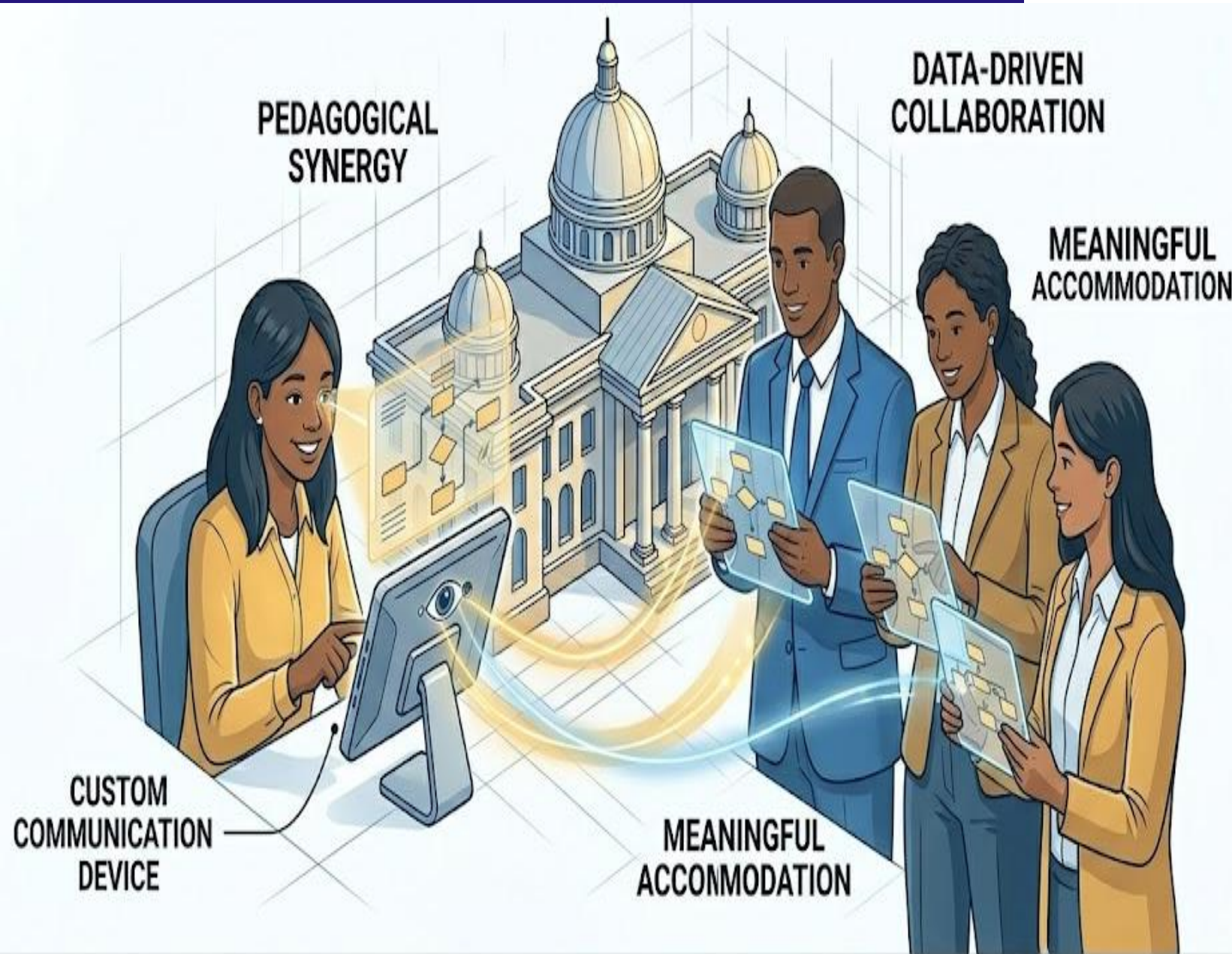
Student (Func. character)  
Environment (Context)  
Tasks (Curricular Goals)  
Tools (Technical solution)



**Selection Criteria:** Matching AT features for real-time monitoring & evaluation.

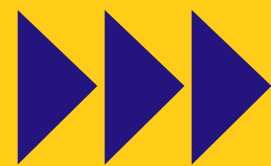
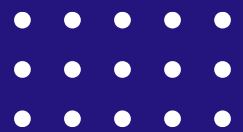


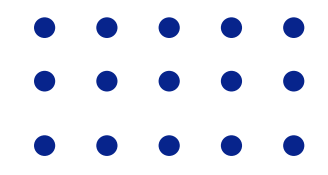
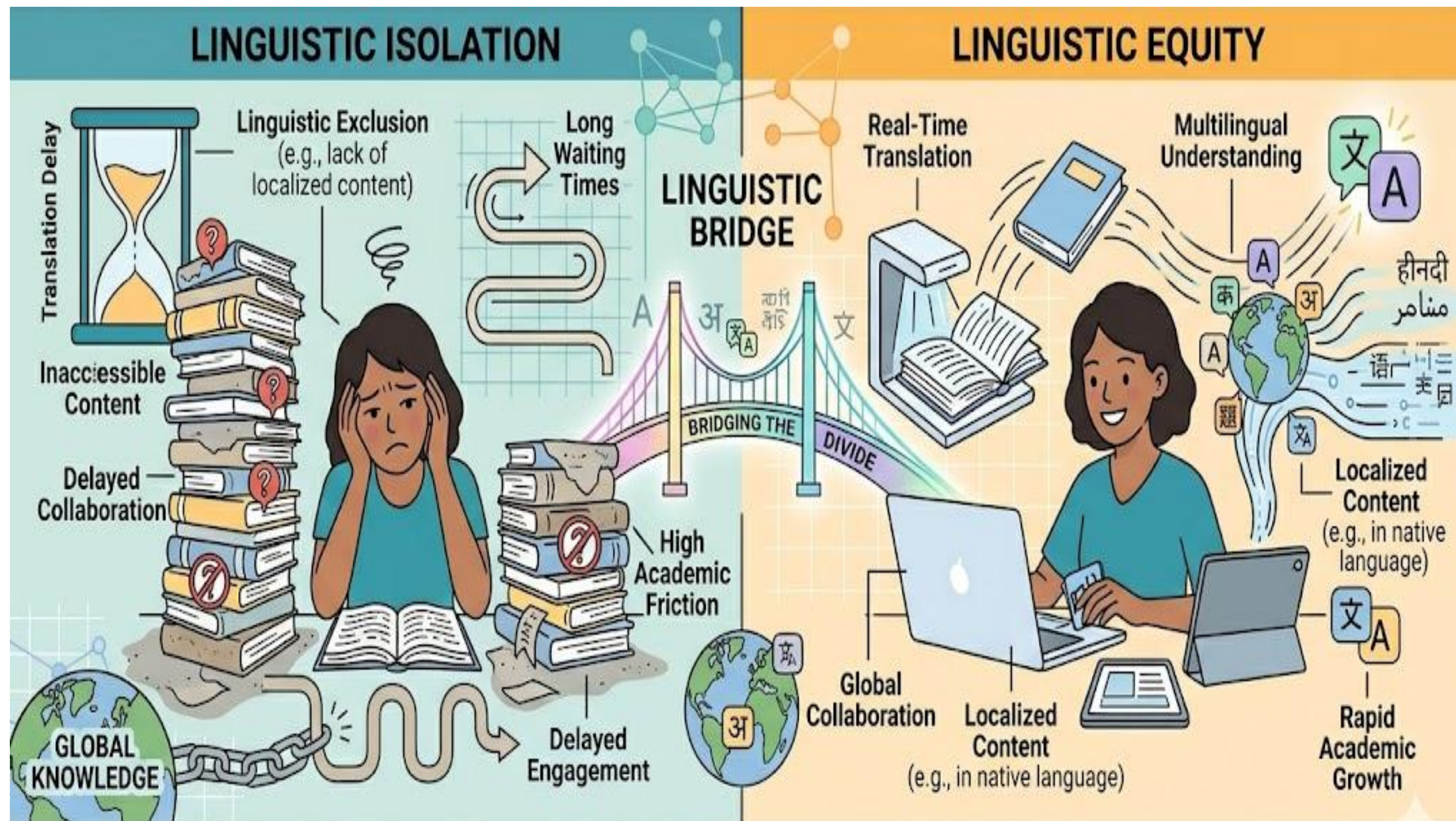
# Part IV: Narrative Phase



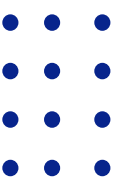
**From Barrier to Breakthrough:  
The Case of Aarya**  
Grade 11 student; high cognitive  
aptitude; significant motor  
impairment affecting manual output.

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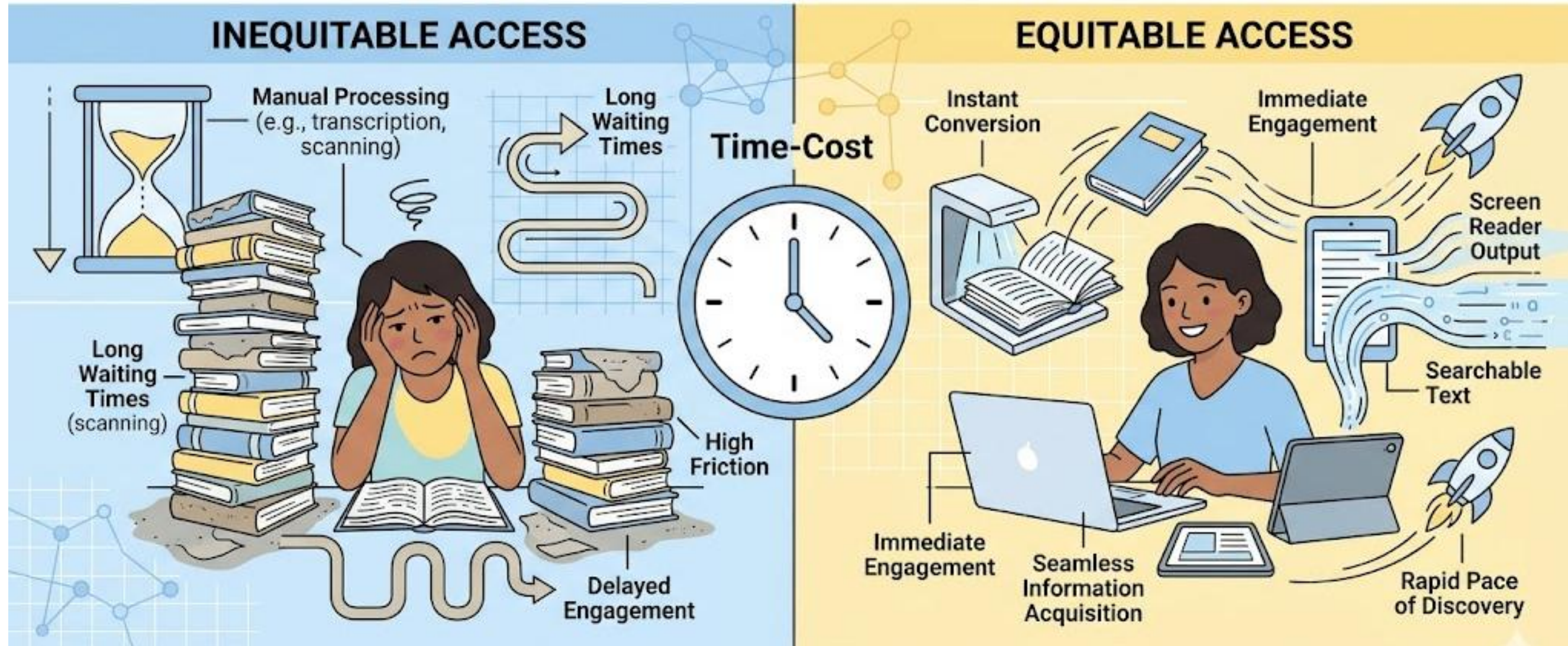
*Does our digital architecture bridge the linguistic divide, or does it inadvertently reinforce academic isolation?*



- Screen Readers (NVDA) & DAISY formats.
- NVDA **supports over 50 languages**, including Hindi & regional dialects.

**Acquisition  
(Sensory Linkage)**

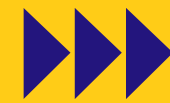
- Is "access" truly equitable if the time-cost of obtaining information remains a barrier to the learner's pace of discovery?



# OCR Efficiency — Microsoft Lens

- Reduces the "Time-to-Access" for physical documents by 95%.
- Converts a library book into a readable digital format in under **30 seconds**.

# Processing (Cognitive Scaffolding)



Func-tion-al  
Syn-er-gy  
in  
In-clu-sive  
Ed-u-ca-tion.

The  
Lear-ner  
Pro-file:  
Di-verse  
pro-cess-ing  
char-ac-ters

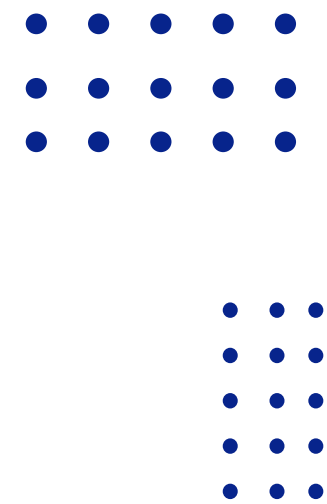
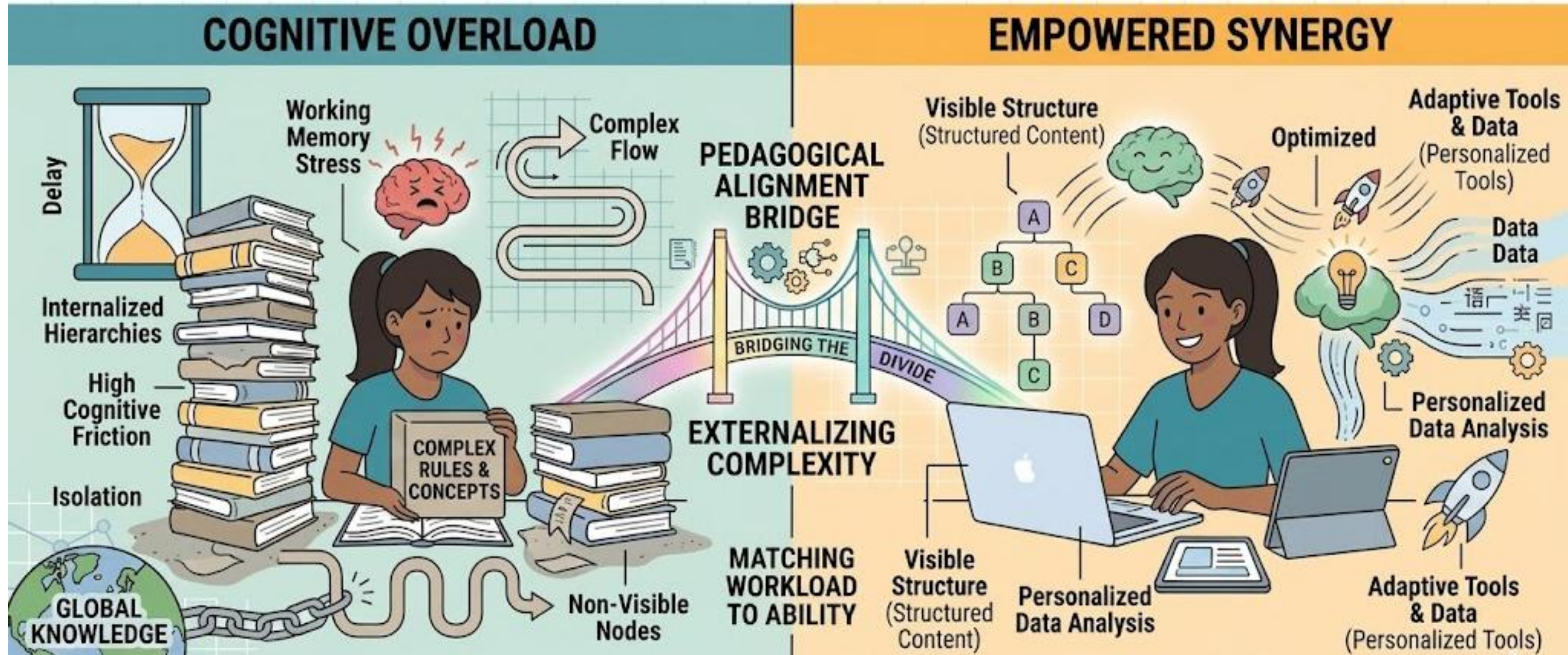
Aa Text Preferences  
S Grammar Options (Syllable marked)  
Reading Preferences (Book with line focus)  
Text Spacing max  
Syllables ON  
Line Focus 1 Line ON

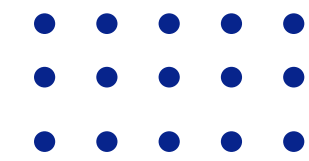
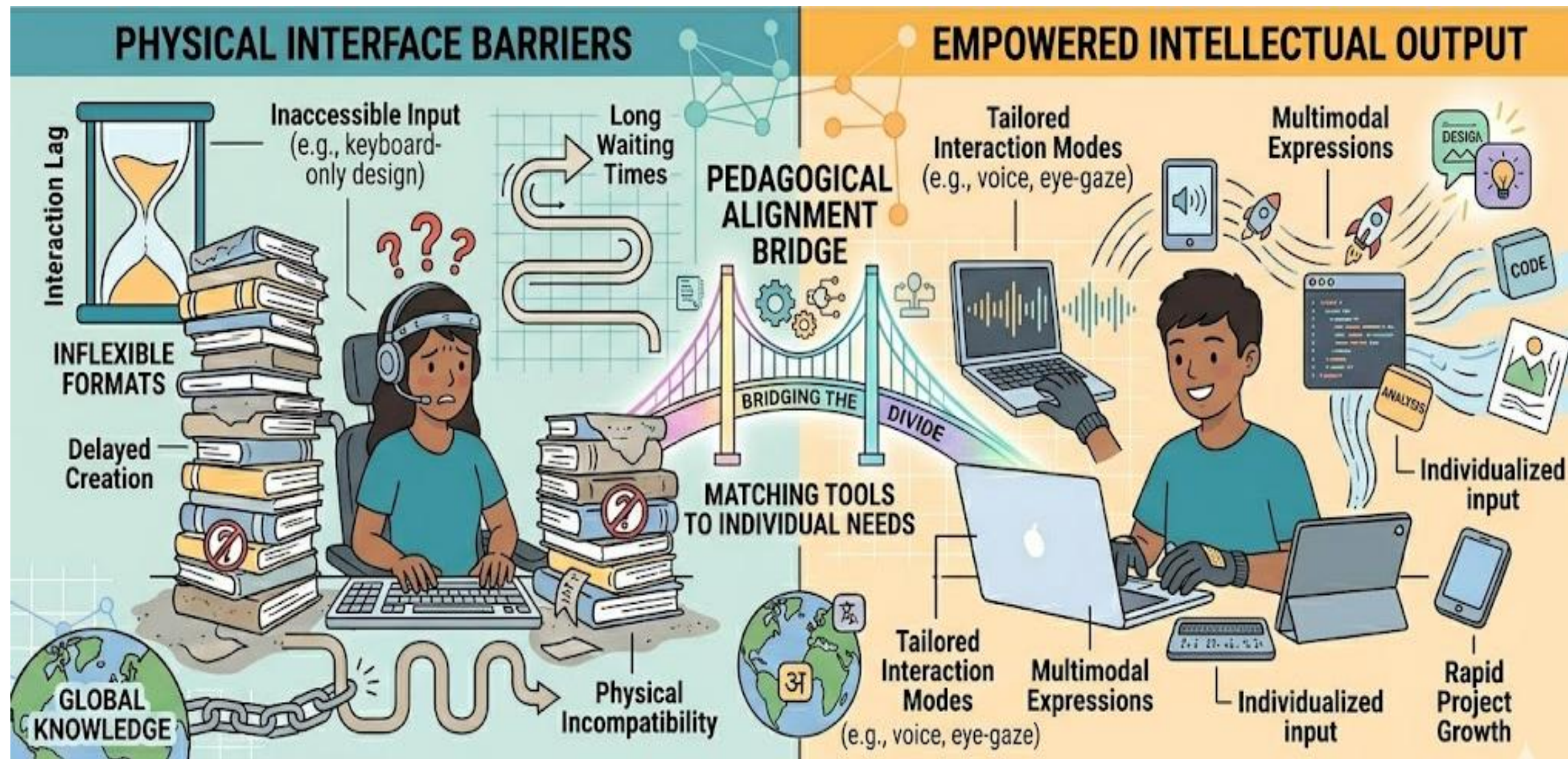
- 01 Processing abstract material with **3D visualizations & simulations.**
- 02 Material pace is **adapted** to the student's abilities.
- 03 Improves reading speed by **25%** & scores by 10%.

*Are we presenting static abstract information, or are we engineering dynamic, personalized pathways to mastery?*

# Visual Logic- MindMeister

*Are we overwhelming the learner's working memory with the architecture of the material, or are we externalizing complexity to unlock their true conceptual potential?*



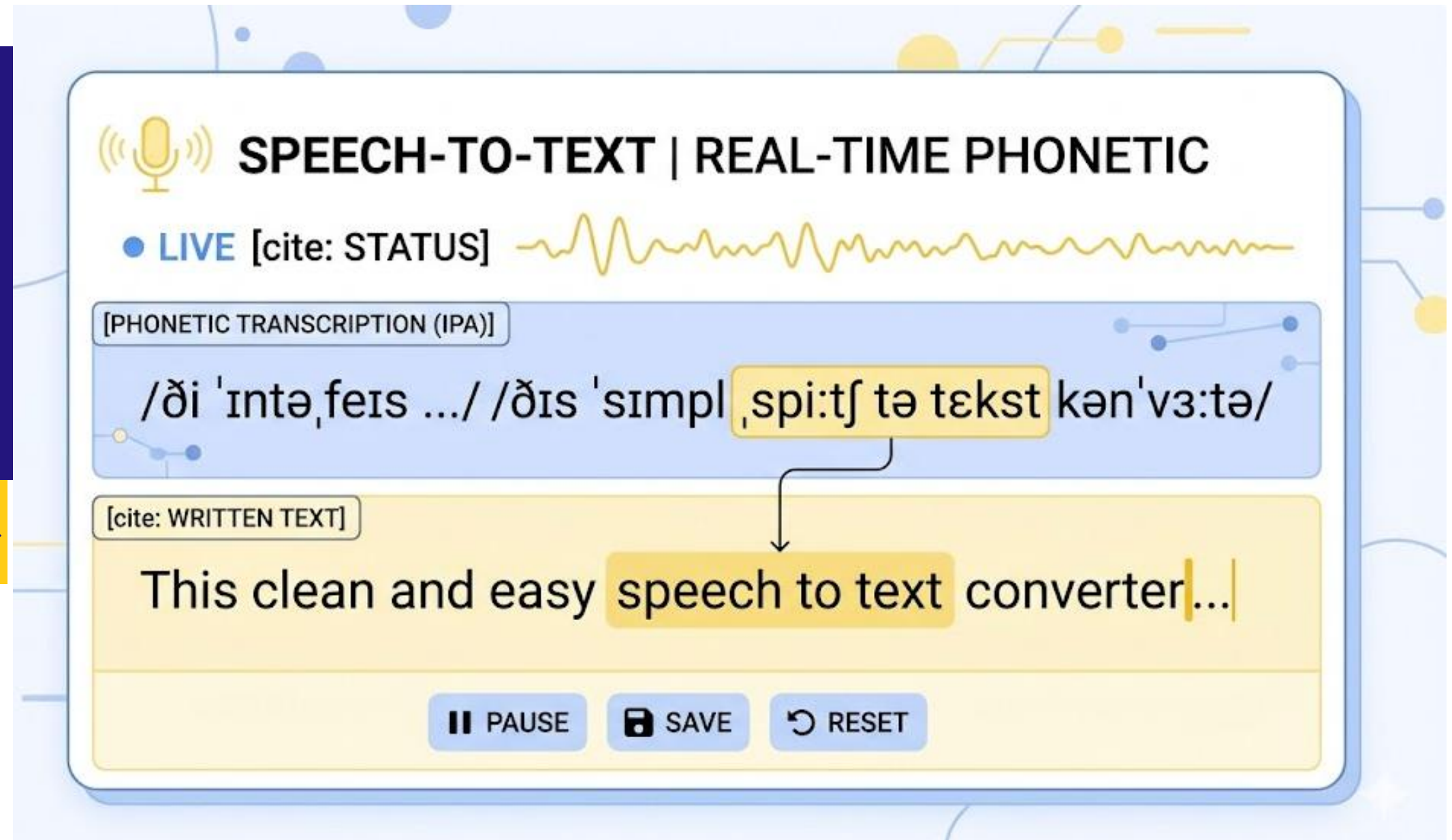
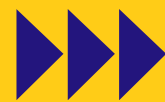


*Is the "output" we measure a reflection of the student's intellectual depth, or merely a measure of their physical compatibility with the interface?*

- **Motor-to-Digital Interfacing** via AR/VR simulations.
- Designing & Drafting through real-world simulations.
- Tobii Eye-Gaze tracks movement at 60-120 fps.

**Expression  
(Motor Linkage)**

# Voice-to-Text — Accuracy & Expression

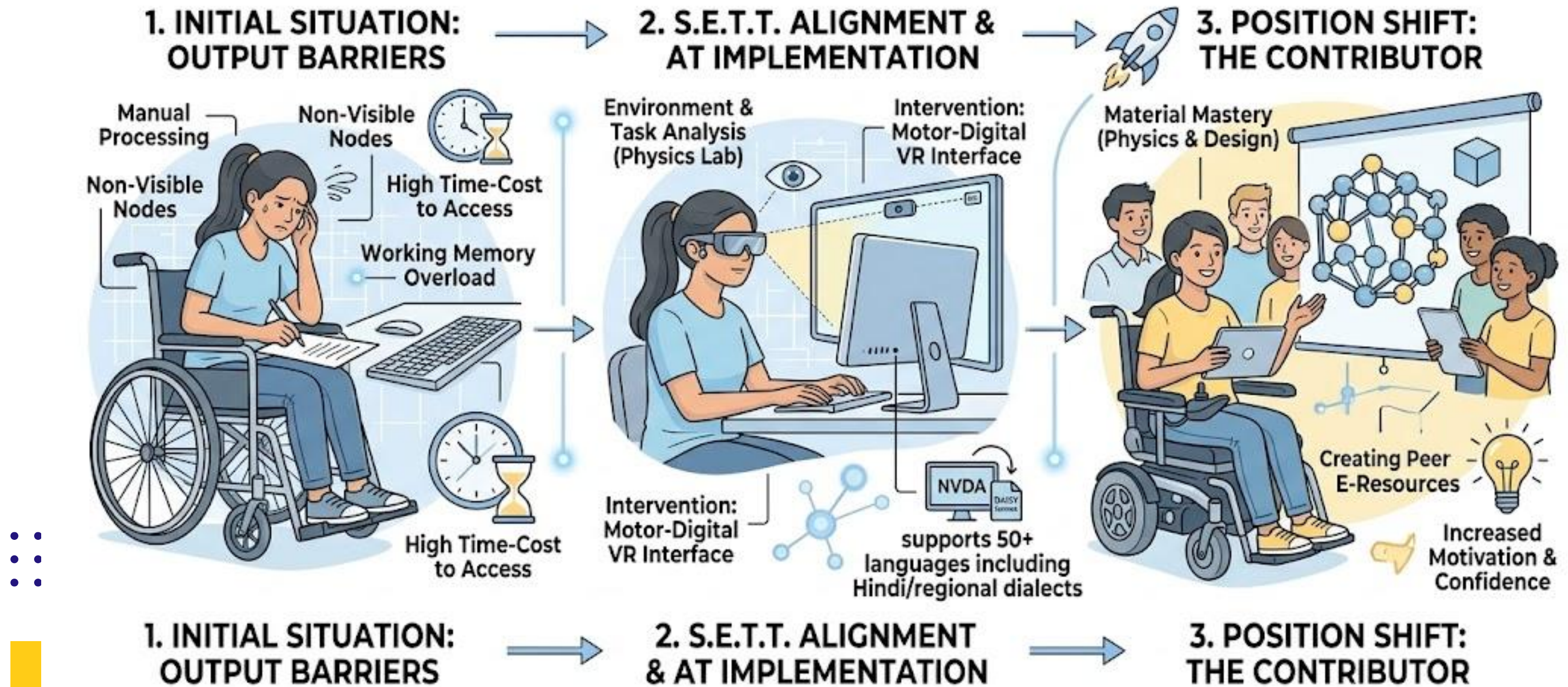


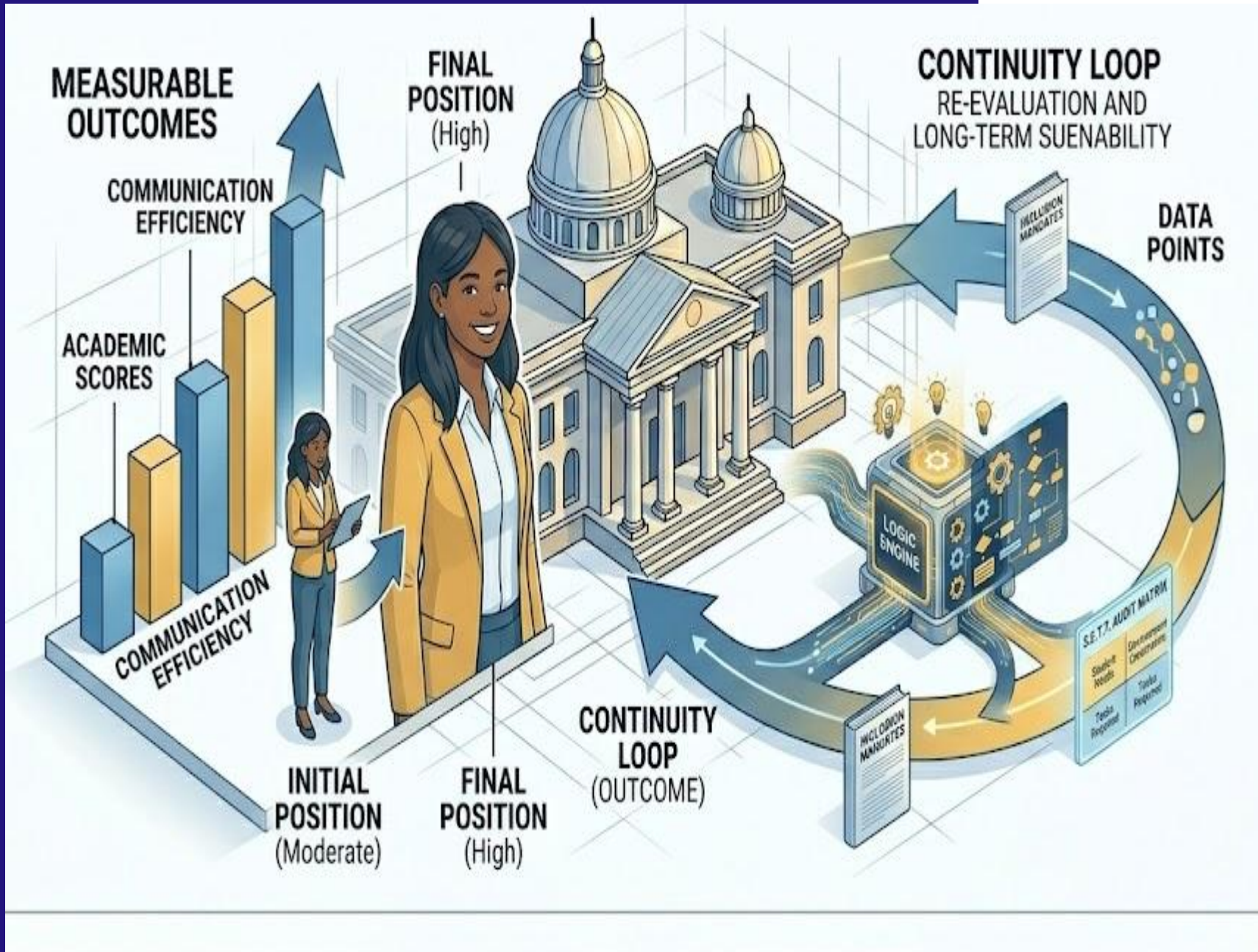
01 Phonetic-to-Text Conversion with **99% accuracy.**

02 Allows teachers to evaluate student progress in **real-time**

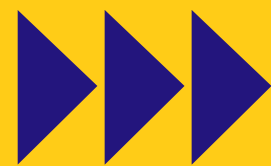
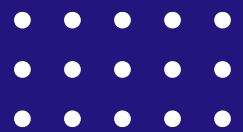
*Does our assessment model capture the learner's authentic voice, or are we filtering their progress through the friction of manual transcription & delayed feedback?*

# AARYA'S NARRATIVE JOURNEY: FROM BARRIERS TO EMPOWERMENT



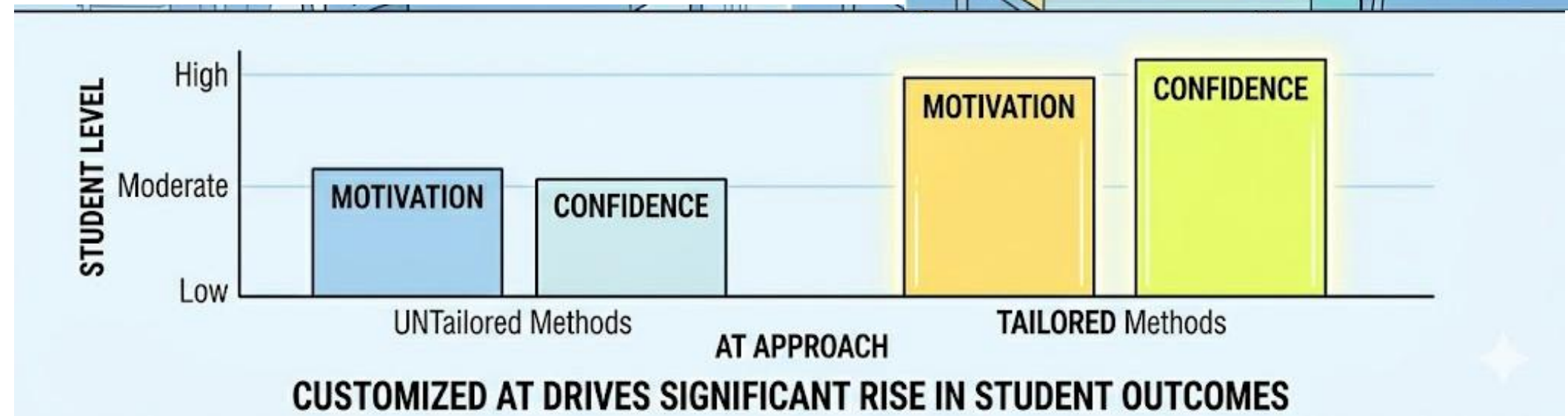
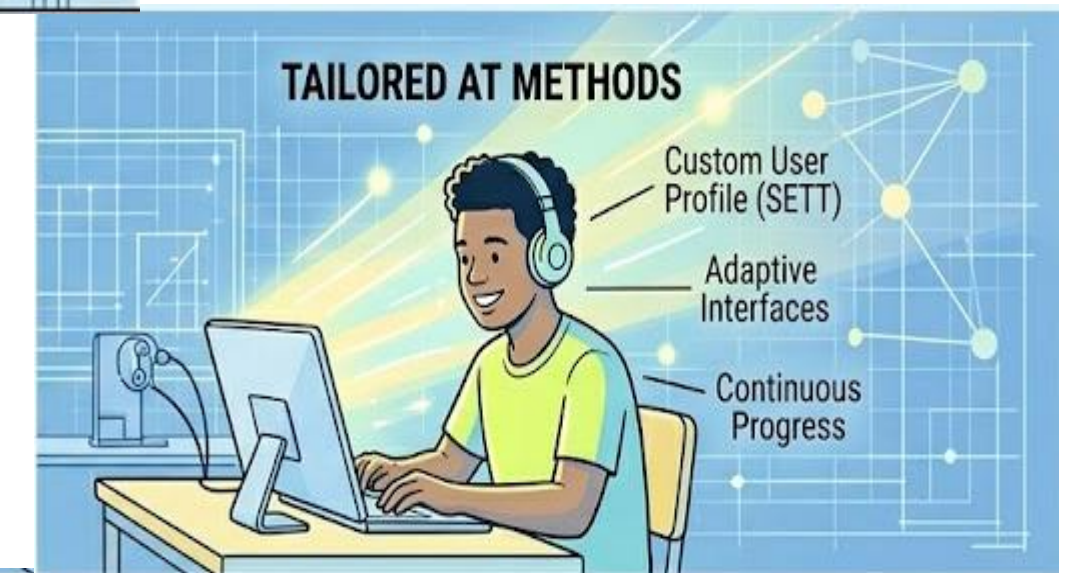


# Part V: Outcome & Continuity



# The Outcome — Agency & Autonomy

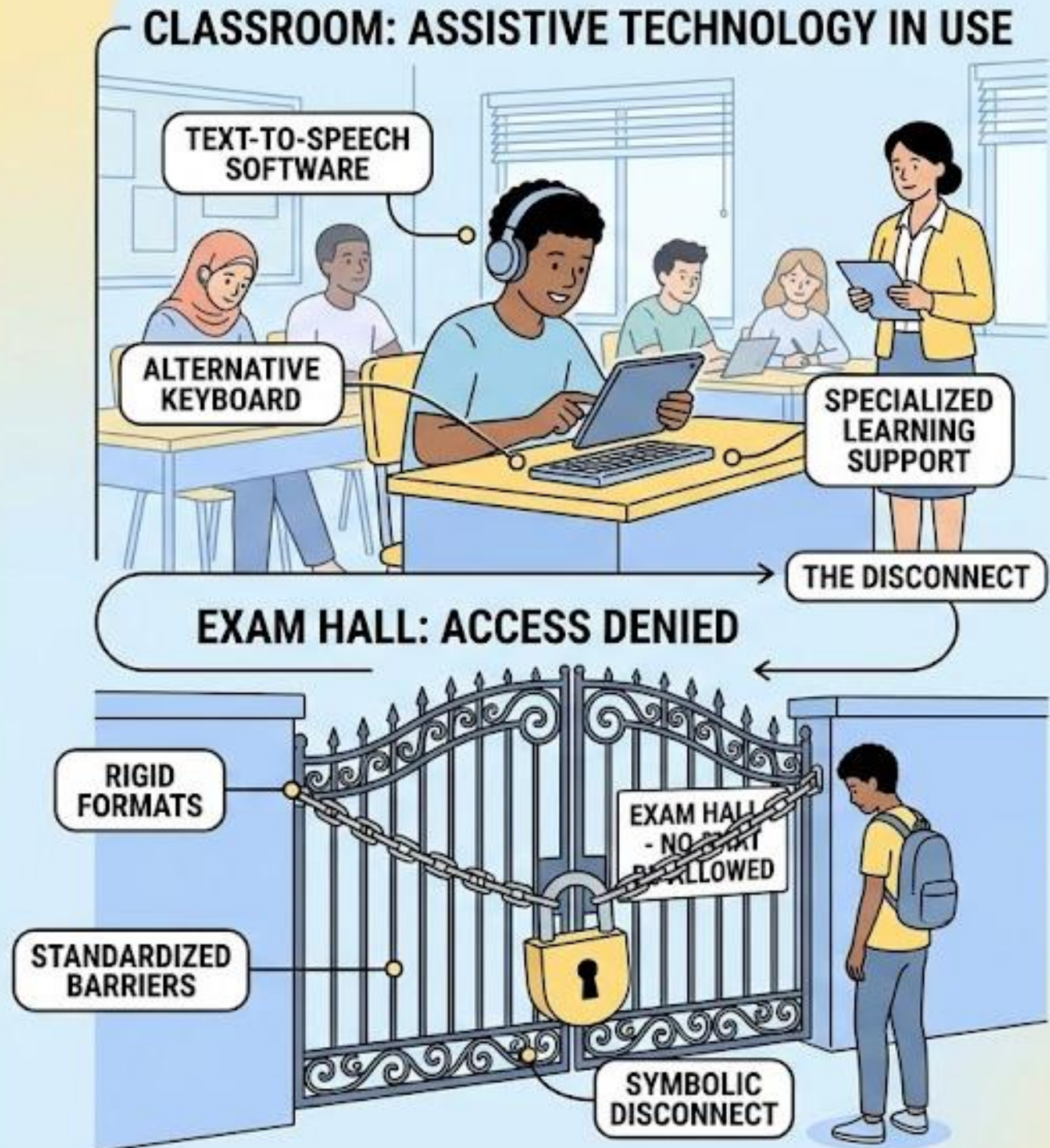
- Facilitate material mastery through **pedagogical approaches** precisely tailored to individual learner profiles.
- **Strategic alignment** ultimately produces a generation of students who are fundamentally motivated, creative, & confident in their academic & professional pursuits.



# The Continuity — Evaluation

## *Assessment disconnect.*

- If we remove the bridge during the exam, we aren't testing science; we are testing the learner's disability.
- Parents must be able to transparently monitor this progress through every phase, including evaluation.



# THE EVALUATIVE AUDIT

A PEDAGOGICAL FRAMEWORK

## INSTRUCTIONAL AT

### (1) CONTENT ACCESS



Enable all content access.

### (2) LEARNER INTERACTION



User-centric interface design.

### (3) CREATIVE EXPRESSION



Diverse expression support.

INTEGRAL PEDAGOGICAL LINK:  
INSTRUCTION ↔ EVALUATION

## PLANNING & SELECTION

1. Match AT to user needs.

## IMPLEMENTATION

2. Refine instruction with data.

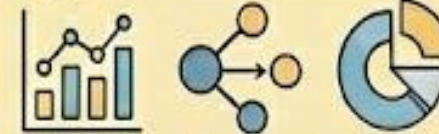
## OUTCOMES

3. Evaluate skill and equity.

System features integrated in one ecosystem.

## EVALUATIVE AT

### (1) DATA MONITORING



Collect and analyze usage.

### (2) PROGRESS TRACKING



Track progress trends.

### (3) OUTCOME ANALYSIS



Assess outcome results.

## Functional Synergy

must extend to evaluation.

Assessment must measure Knowledge, not the **Access Barrier**.

*Objective:*

*1:1 Parity between Learning Tools & Testing Tools.*



# Toolkit — Family of Apps Repository

## ASSISTIVE TECHNOLOGY: EDUCATIONAL APP REPOSITORY



### **SENSORY:** **Audio Tutor**

Listening Skills  
& Focus



### **COGNITIVE:** **Memory Coach**

Brain Training &  
Memory Games



### **PHYSICAL:** **Move Master**

Gross Motor Skills  
& Coordination



### **SENSORY:** **Visual Explorer**

Visual Perception  
& Tracking

### TOOLKIT ACCESS



Scan for Repository



### **COGNITIVE:** **Logic Builder**

Problem Solving  
& Reasoning



### **PHYSICAL:** **Skill Drills**

Fine Motor Skills  
& Drawing



### **SENSORY:** **Tactile Play**

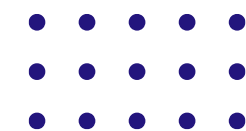
Touch Sensory  
Activities

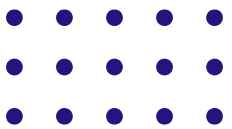
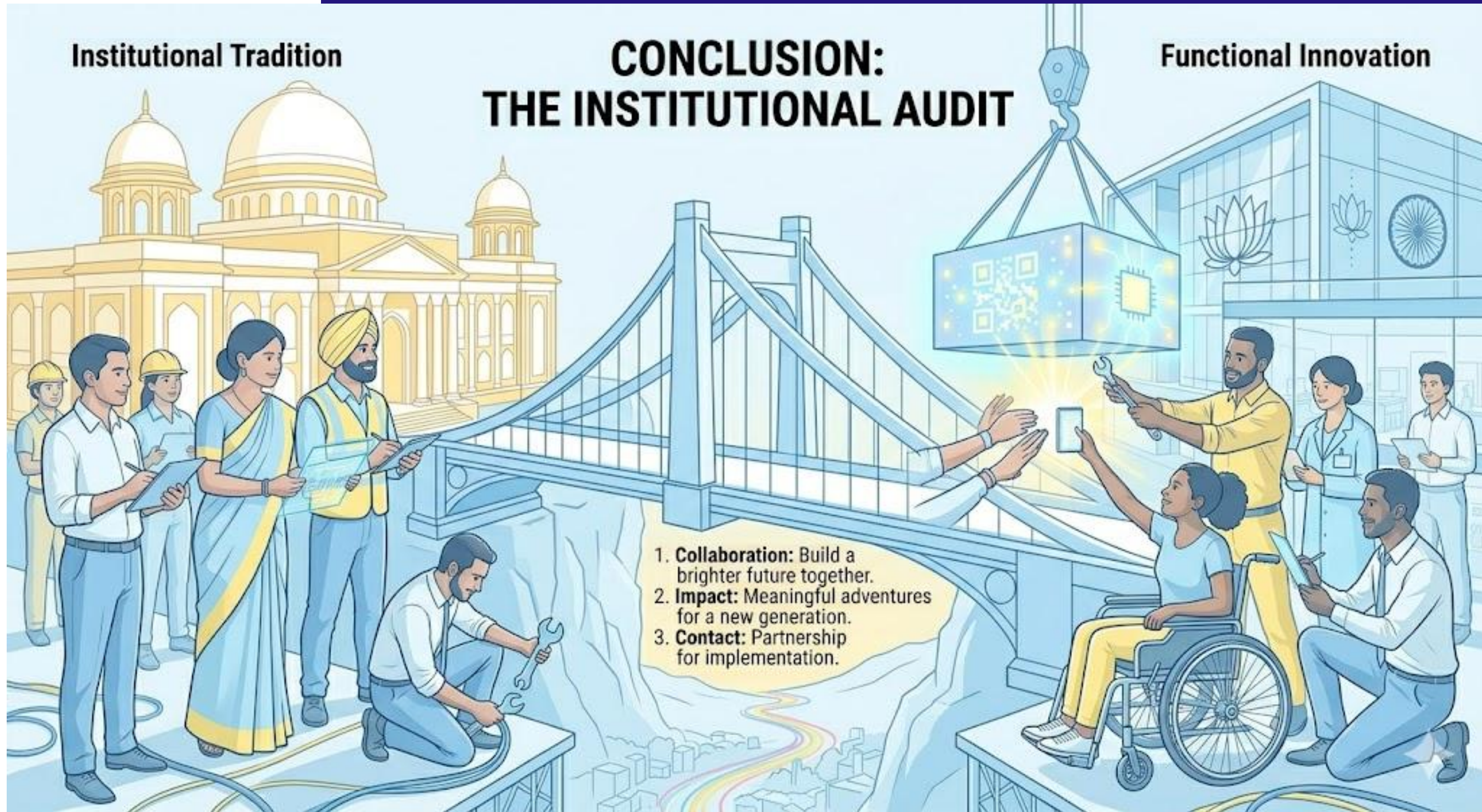


### **PHYSICAL:** **Balance Challenge**

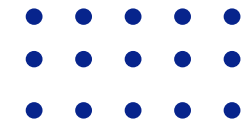
Stability &  
Movement Control

Featured system features integrated into one ecosystem.





*Let's build a brighter future for education together. This is about making learning a meaningful adventure for every student.*



**Thank you so much**

