

# Personalizing Teaching through Instructor-AI Collaboration: The SAMI Dashboard



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Scan for SAMI Dashboard

## Problem:

- Online learning limits visibility of **student interaction, relationships, and belonging**
- Instructors lack insight into **social dynamics shaping engagement**
- Existing dashboards focus on **activity** rather than **connections**
- Limited support for **actionable, instructor-centered decision-making**

**Result: Instructors struggle to develop social intelligence about their classrooms**

## Solution:

- The **SAMI Dashboard** is an instructor-facing learning analytics system that:
    - Integrates **social, behavioral, and affective data**
    - Visualizes **connections, participation, and belonging**
    - Uses **conversational AI** to support interpretation and decision-making
- Moves beyond activity tracking toward socially grounded analytics**

## Conceptual Framework:

### Representation Personalization

- Role-adaptive visualizations

**Personalizes what is seen**

### Interaction Personalization

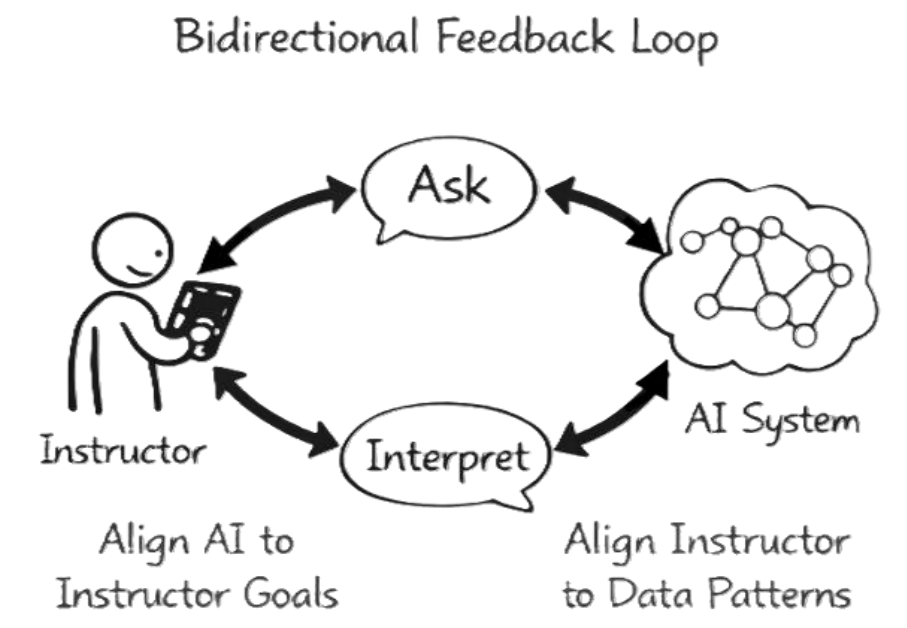
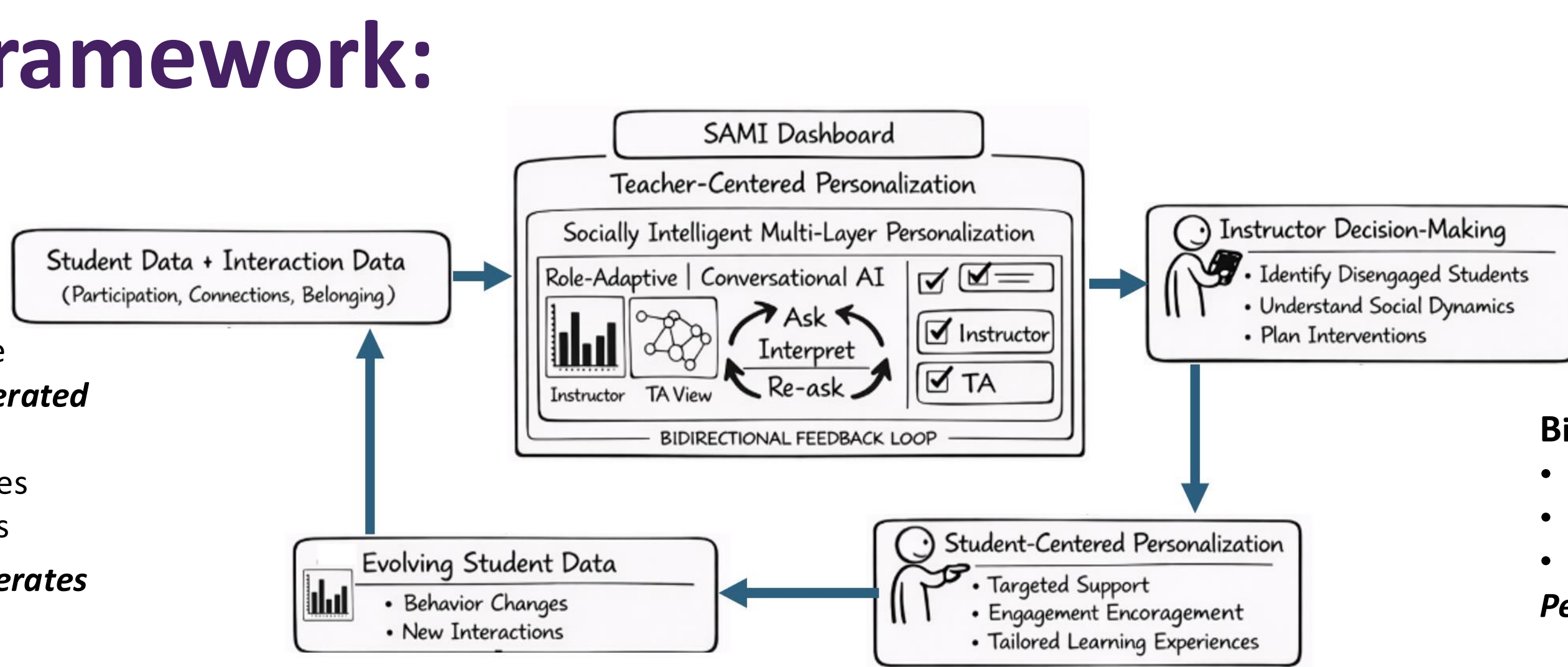
- AI supports iterative sensemaking
- Instructors ask → interpret → refine

**Personalizes how insights are generated**

### Contextual Personalization

- System adapts to user responsibilities
- Different views for instructors vs TAs

**Personalizes for whom the system operates**



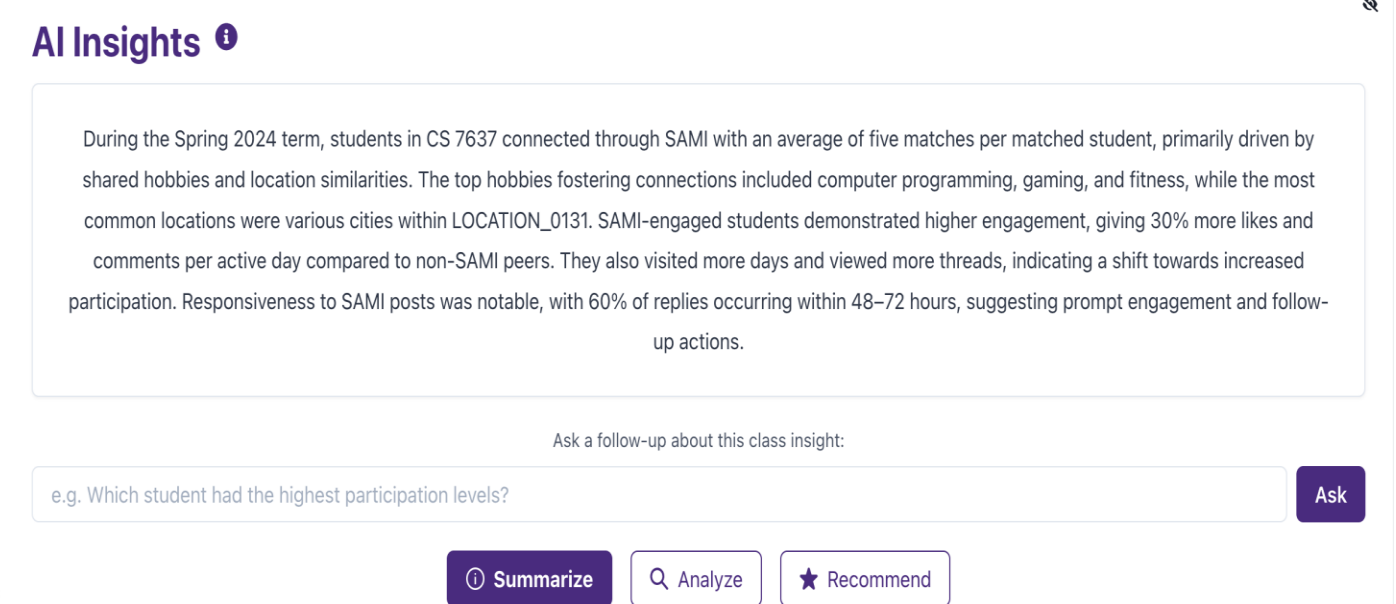
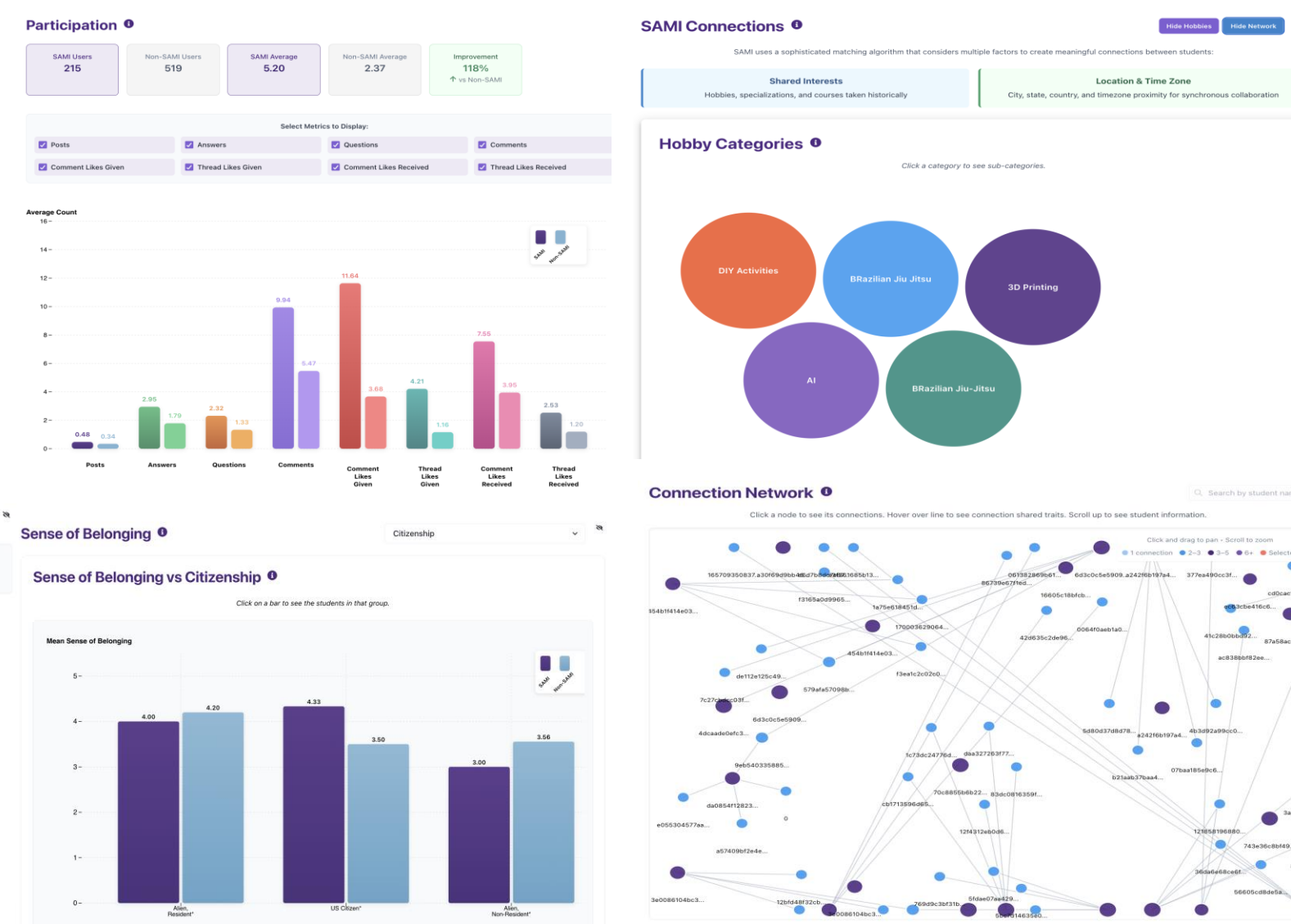
### Bidirectional Human-AI Feedback Loop

- Instructor behavior shapes AI outputs
  - AI responses shape instructor decisions
  - Interaction evolves through repeated use
- Personalization emerges through co-adaptation**

## System Design:

### Socially Intelligent Analytics Modules:

- **Participation** → engagement as a social signal
- **Academic Performance** → linked to interaction patterns
- **Personality** → dispositional context
- **Belonging** → demographic and social integration
- **Connections** → how students relate and interact



### Conversational AI (GPT-4o)

- Natural language interaction
  - Summaries, explanations, and recommendations
  - Supports iterative exploration
- Reduces cognitive load and supports sensemaking**

## Research Questions:

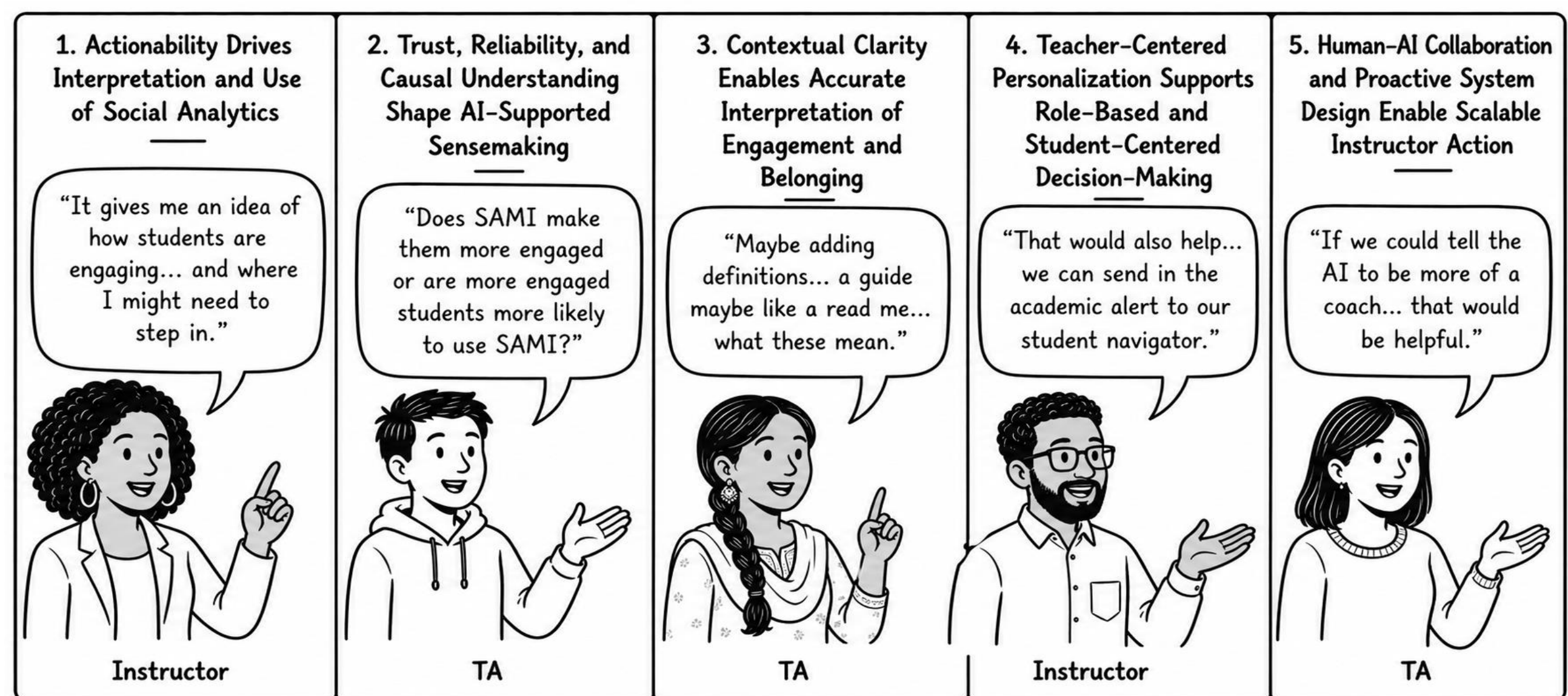
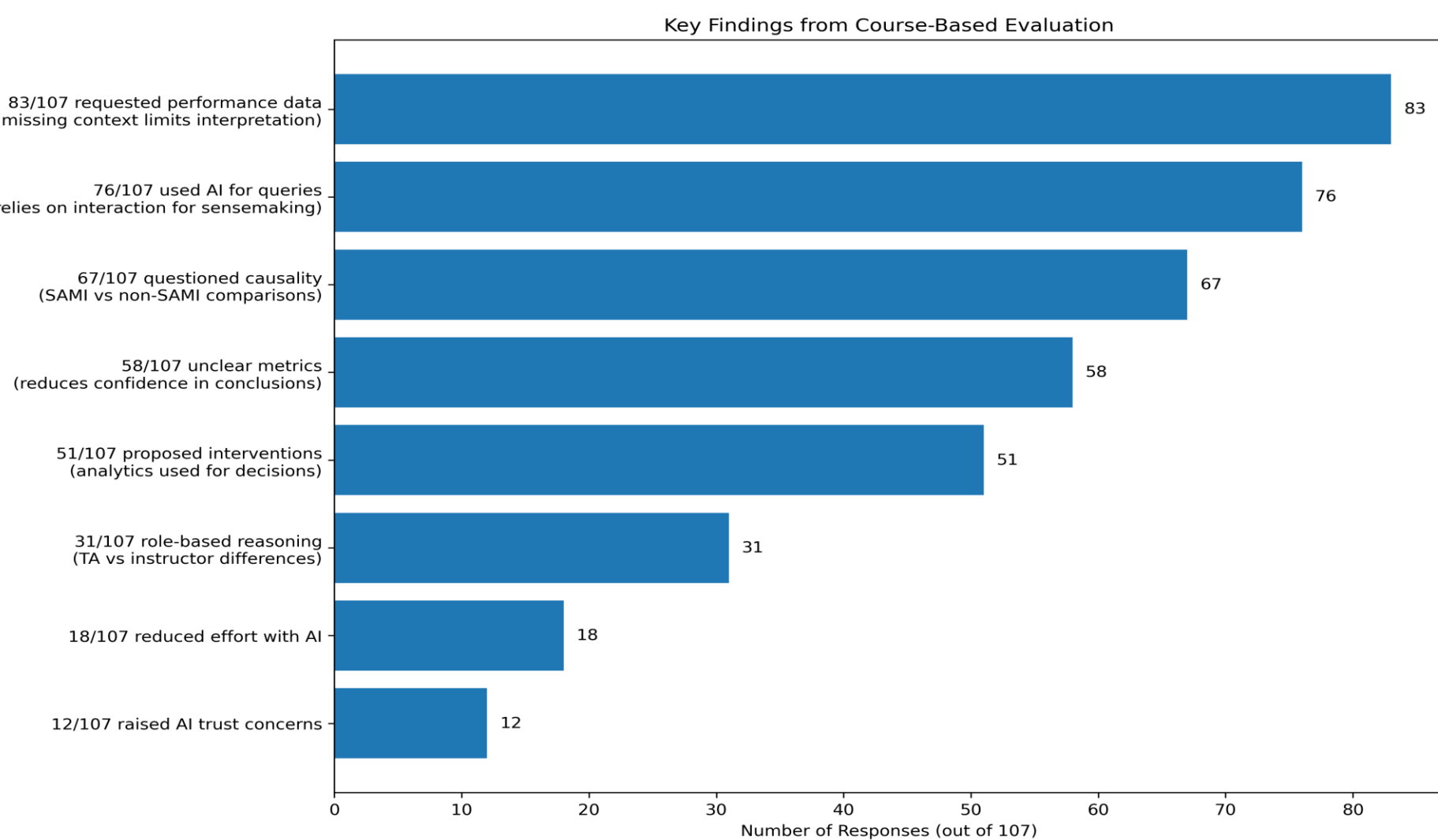
- RQ1:** How do instructors interpret socially grounded analytics when examining engagement and belonging dynamics in online courses?
- RQ2:** How does conversational AI support instructor sensemaking and decision-making in learning analytics dashboards?
- RQ3:** How does teacher-centered personalization, including role-based adaptation and human-AI feedback loops, enable instructors to provide student-centered support?

## Methodology:

**Mixed-methods evaluation Spring 2024 – Spring 2026**  
**Participants:** 126 total, 107 Students, 11 Teaching Assistants, 8 Instructors

**Methods:** Think-aloud interviews (TAs and Instructors), Course-based evaluation (Students)  
**Focus:** Interpretation of analytics, AI interaction, Instructional decision-making, re-design exercises

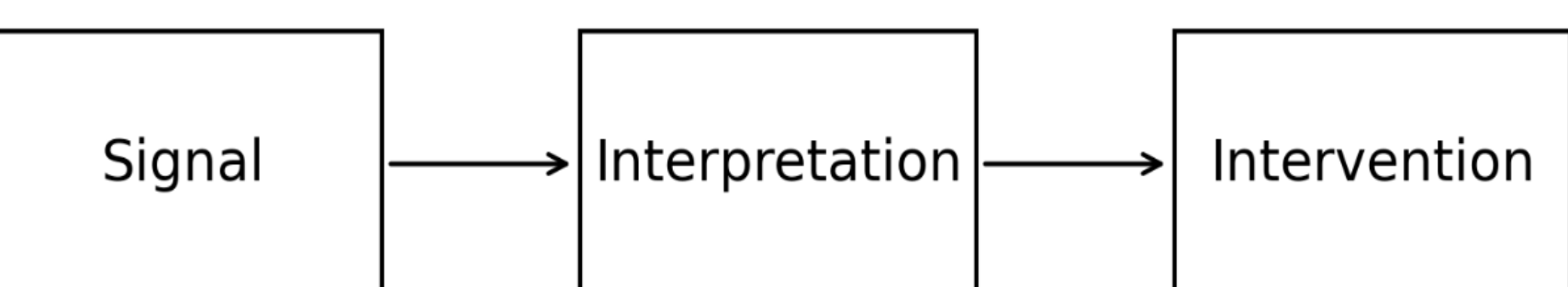
## Results:



Instructors actively engage in sensemaking, relying on social and relational metrics over activity data. Their interpretations and actions are shaped by their instructional roles.

## Design Implications:

- Design for **actionability**: integrate intervention tools (outreach buttons, intervention queues)
- Provide **context-rich analytics**: include grades, trends, and explanatory signals
- Make **uncertainty explicit**: show confidence levels and clarify causal limitations
- Support **role-based views**: adapt dashboards for instructors vs TAs
- Enable **interactive human-AI collaboration**: allow iterative queries and verifiable AI outputs
- Implement **proactive systems**: alerts and summaries for engagement changes and at-risk students



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