Conversational EdTech
for Scalable Education and Training

Dee Kanejiya
Founder & CEO
Cognii
AI / Virtual Assistants

- Apple Siri
- Google Assistant
- Microsoft Cortana
- Amazon Alexa
- Samsung Bixby
Evolution of AI

1950's
Toy Problems

1960's
Deterministic

1980's
Statistical

2000's
Hybrid

Big Data
Social Media

2020's
Neural/Vertical

Health
Education
E-commerce
...
AI in Education

Administrative
- Enrollment
- Retention
- Engagement
- Outcomes
- Job Readiness
- Student support

Academic
- Assessment
- Tutoring
- Online Learning
- Instructional Design
- Developmental, Placement
- Remediation, Intervention
Conversational Education

> Conversational Commerce

How AI will transform education

Education has mostly followed the same structure for centuries — e.g., the

Role of Conversation in Education
Ideal Form of Education/Training

- Personalized
- Individualized
- Adaptive
- Engaging

Teacher/Student: one-to-one
Reality

Classroom of 30 students

Lecture Hall of 300 Students

MOOC of 3,000 Students

Teacher/Student: one-to-many
Education Industry Problems

Instructor Overload

Poor Quality of Assessment and Feedback

Lack of Student Engagement

Student Dropouts

Low Graduation Rates

Lack of Career Readiness

National Competitiveness

Rising Tuition Costs

Student Debt

Institutional Financial Sustainability
Conversational Pedagogy

Open Response Questions
- Active recall
- Critical thinking
- Problem Solving

One-to-one Tutoring
- Higher achievement
- Immediate feedback
- Multiple attempts

(B. Bloom, 1984)
Cognii Innovation

Conversational Pedagogy

+ Conversational Technology

= Conversational EdTech
AI / Virtual Assistants

General Purpose

Apple Siri
Google Assistant
Amazon Alexa
Microsoft Cortana

Education Focused

Cognii
Virtual Learning Assistant

- Personalized **Tutoring**
- Automatic **Grading** of open-response answers
- Rich Learning **Analytics**

Neurons are the basic building blocks of the nervous system. A neuron consists of dendrites and a cell body called soma.

What are the structures of a typical neuron?

Very close! Would you like to explain the neural transmitter?
VLA Technology

Natural Language Processing

Language Syntax
Deeper Semantics
Conceptual Hierarchy

Cognitive Computing

Personalized Adaptive Learning
Virtual Learning Assistant

- AI asks a question, user answers it, AI evaluates - tutoring conversation ideal for learning
- Input length - answers are long (10-100 words)
- Deep NLP - robust semantic analysis, applicable to large number of content areas.

General purpose
Virtual Assistants / Chatbots

- User asks a question, AI answers it - not ideal for learning assessments
- Input length - questions are short (1-10 words)
- Shallow NLP - only a few types of intents are generally recognized.

Intents, Semantics
Application Areas

Across Levels

Across Subject Areas

Across Depths of Knowledge (Webb’s)
Case Study: UMass Boston

Prof. Brian White
Department of Biology
Provost Fellow for Education and Technology
UMass Boston

Area of expertise:
Science Education
MOOCs
Flipped Class
Blended Learning
Students Feedback

Student satisfaction rating > 95%

“I learnt a lot with Cognii questions than I did in the classroom.”

“This AI is kind of creepy, but in a good way.”
Teachers Feedback

Brian White, Professor, UMass Boston

Open response answers are big pains to grade. Cognii was hugely valuable.

Ivy Carnabucci, Teacher, Medford High School, MA

Cognii helped students get instant feedback that would have taken me days to grade!
Benefits of Conversational EdTech

**Students**
- Learning Outcomes

**Educators**
- Productivity & Insights

**Organizations**
- Scalable Quality
Virtual Learning Assistant

Most Innovative EdTech of the Year

Best Learning Assessment Innovation

Innovation Research Grant Award
Conversational EdTech

Cognii