Looking at the future of Cognitive Technology in Education

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Management Review Survey

The top five benefits of AI

Percentage of survey respondents who rated each benefit in the top three for their company

- Enhance current products: 44%
- Optimize internal operations: 42%
- Make better decisions: 35%
- Optimize external operations: 31%
- Free workers to be more creative: 31%

90% of the surveyed executives report already having AI strategies in place.

3,000 business executives surveyed revealed that pioneering companies are deepening their commitments by prioritizing revenue-generating AI applications over cost-saving ones.


Cognitive Technologies are products of the field of artificial intelligence. They are able to perform tasks that only humans used to be able to do.
By harnessing the power of artificial intelligence, the learning environment adapts and responds to the learner by providing remediation, feedback and support on-demand.
Session goals and objectives:

• Review cognitive technologies and establish use cases for higher education

• Discuss the impact cognitive technologies have on students’ learning experiences and instructors’ productivity, and course development processes

• Review how artificial intelligence is currently being used to impact student outcomes

• Review the benefits and challenges of cognitive learning technologies
Jack Ma on the future of education

https://www.youtube.com/watch?v=rHt-5-RyrJk
Florida town is first in the world to test autonomous school shuttles

On October 19, the U.S. Department of Transportation’s National Highway Traffic Safety Administration (NHTSA) directed Transdev North America to immediately stop running its Babcock Ranch autonomous school shuttles, calling the pilot program “unlawful and in violation of the company’s temporary importation authorization.”

<table>
<thead>
<tr>
<th>ASSISTED INTELLIGENCE</th>
<th>AUGMENTED INTELLIGENCE</th>
<th>AUTONOMOUS INTELLIGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humans comprehend data and generate insights</td>
<td>Machine learning augments human decisions</td>
<td>Artificial intelligence decides and executes autonomously</td>
</tr>
</tbody>
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Transportation

- **Cruise control** automatically maintains a vehicle’s speed
- **Lane detection systems** use sensors to aid drivers
- **Self-driving cars** operate with sensors and software

Source: *The AI Advantage*
Artificial Intelligence: Education and Personalized Learning with Cynthia Breazeal
Director, Personal Robots group
MIT Media Lab

https://www.youtube.com/watch?v=dBBrUgiUQml
Emerging technologies and use cases for higher education
AI-Based Video Captioning

A VerbIT transcription process starts with an adaptive AI engine that automatically transcribes content at very high accuracy, regardless of subject matter or accent.

IBM has launched Watson Captioning, a new standalone offering using artificial intelligence (AI) to automate the captioning process.
Artificial Intelligence and Micro Credentials

The Penn State University Library is using artificial intelligence to evaluate student work submitted for a badge, which provides real-time feedback for student responses.

Researchers have developed a chatbot that has been shown to reduce the symptoms of anxiety and depression.

'Woebot', engages in 2 million conversations a week via Facebook Messenger

Tess is a mental health chatbot. If you’re experiencing a panic attack in the middle of the day or want to vent or need to talk things out before going to sleep
Using AI Chatbots to Freeze ‘Summer Melt’ in Higher Ed

Of the 50,000 plus student messages received, less than one percent required the attention of Georgia State staff.
How artificial intelligence is currently being used to impact student outcomes
FIU Online is piloting a virtual learning assistant powered by natural language processing to engage students in personalized tutoring conversations, providing immediate scoring and feedback on written answers to open-response questions.
Cognii Virtual Learning Assistant engages a student in a chatbot-style learning conversation by prompting them to construct an answer, giving them instant formative assessment, tutoring them with personalized hints and tips, and guiding them towards conceptual mastery.
Question: Identify four types of financial aids

Please type your answer in the box below to receive instant assessment and coaching.

Score: 50%  
Attempt: 1/3  
Feedback:  
You are getting there. Could you tell us more about grants and loans?

Score: 100%  
Attempt: 2/3  
Feedback:  
Perfect! Financial aid has many options for helping students pay for college. A few ways financial aid can help with the cost of school are: grants, student loans, scholarships, and Federal Work Study.

Question: What is the result of NOT paying your fees/tuition on time?
### Please Enter rubrics

You can enter up to 8 concepts rubric criteria.
Enter each example variation for a concept on a new line inside Examples box.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Score</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>grants</td>
<td>0.25</td>
<td>Grants are generous gifts</td>
</tr>
<tr>
<td>scholarships</td>
<td>0.25</td>
<td>Scholarships are funds offered to students who meet specific criteria</td>
</tr>
<tr>
<td>student loans</td>
<td>0.25</td>
<td>Loans are funds that are borrowed to help meet educational expenses</td>
</tr>
<tr>
<td>Federal Work Study</td>
<td>0.25</td>
<td>Federal Work Study (FWS) is a form of financial aid largely provided by federal funding</td>
</tr>
</tbody>
</table>

[Add Rubric]

[Update Question]  [Cancel]
Did Cognii feedback help you improve your answer?

31 responses

- Always: 51.6%
- Mostly: 35.5%
- Sometimes: 9.7%
- Not at all:
Did you practice the same question multiple times?

31 responses

- Yes: 87.1%
- No: 12.9%
Do you think Artificial Intelligence can help education?

31 responses

- **Yes**: 74.2%
- **No**: 19.4%
- **Maybe**: 6.4%
What did you like about Cognii?

“Getting an immediate response was great… If I had to wait longer for my results I might have just moved on and not looked at the correct answer.”

“I liked the fact that my grade was instant.”

“Very reliable. It was able to assess my answers in a correct manner.”

“Modern way of doing homework; easy to understand.”

“I liked that it helped me by giving me hints to answer the question correctly.”
AI-Based Teaching Assistant Jill Watson

A graduate-level teaching assistant who can hold office hours 24/7/365. Built on IBM’s Watson platform, Jill is the world’s first artificially intelligent TA.

Soon Jill will be able to answer about 40 percent of the 10,000 questions students ask each semester. And she doesn’t even need coffee breaks.

https://smartech.gatech.edu/bitstream/handle/1853/59104/goelpolepeddi-harvardvolume-v7.1.pdf
Al-Based Teaching Assistant Jill Watson

Resolved vs. Unresolved

1 year ago
Should we be aiming for 1000 words or 2000 words? I know, it's variable, but that is a big difference...

Jill Watson 1 year ago There isn't a word limit, but we will grade on both depth and succinctness. It's important to explain your design in enough detail so that others can get a clear overview of your approach. It's also important to keep things clear and short.

1 year ago Jill can you please elaborate on "It's important to explain your design in enough detail".
what kind of design are you referring to?

Lalith Polepeddi 1 year ago I think Jill is using "design" as a catch-all statement. For the midterm, it refers to the shortcomings of each technique. For the assignments and projects, it refers to the agent's approach.

1 year ago Sure enough thanks Lalith.

1 year ago I'm beginning to wonder if Jill is a computer, if there is anything this class has taught me, is that I should always question if someone I've met online is an AI or not.

1 year ago her name is Watson ;)

https://smartech.gatech.edu/bitstream/handle/1853/59104/goelpolepeddi-harvardvolume-v7.1.pdf
Amazon Lex

**Delivery Order**

**Intents**
A particular goal that the user wants to achieve

I'd like to order flowers.

Utterances
Spoken or typed phrases that invoke your intent

What kind?

Slots
Data the user must provide to fulfill the intent

1 dozen roses please.

Prompts
Questions that ask the user to input data

Where should we deliver?

Fulfillment
The business logic required to fulfill the user's intent

Can I go ahead with your order of a dozen roses to your home?

Thank you. Your order went through successfully.

Home.
Developing Virtual Patients for Medical Education

Virtual patients system from Ohio State University, provides immediate feedback on student performance, allowing students to rehearse professional behaviors and interviewing skills prior to working with real patients.

https://www.youtube.com/watch?v=mvXIrUmt9Ek
Adaptive Learning Experience

Adaptive learning systems provide each student with a personalized learning experience, adapting the presentation of content and possibly assessments according to differences in student skills sets.
community that sugared gum causes cavities. Shortly thereafter, the advertising department launched a survey and this famous statistic was born.

Now examine the statement more closely:

- First, the statistic refers to patients who chew gum. What about the patients who don’t chew gum? Do dentists recommend sugarless gum to them as well?

- Second, if four out of five dentists recommend sugarless gum, what does the fifth dentist recommend? Are 20 percent of all dentists out there recommending that their patients chew sugared gum? Or maybe the other 20 percent of dentists do not recommend chewing gum at all. Or are we even talking about all dentists out there? After all, the statement says "four out of five dentists surveyed."

Why would Trident leave so many open questions? Most likely, it was because the answers wouldn’t help them sell gum. Advertisers routinely omit information in order to make their product look good, and it is understandable why they do this. Their goal is to sell the product, but in statistics, intentionally omitting information is unethical.

It diminishes the value of the information and can be misleading.

In particular, the statistic "four out of five dentists recommend sugarless gum" sounds good, but it doesn’t mean anything unless you know what the fifth dentist recommends.

That said, Trident gum is endorsed by the American Dental Association. The organization claims that chewing sugar-free gum 20 minutes after eating stimulates saliva flow, which helps prevent cavities by reducing plaque acids and strengthening teeth.
AI will not immediately replace existing roles and functions. AI magnifies the need for expert involvement.
Of the roughly 1,100 IT and business executives interviewed, 39 percent identified “data issues” as being among the top three greatest challenges.
7 Roles for AI in Education

• Automate grading
• Support teachers and students
• Meet a variety of student needs
• Allow teachers to act as learning motivators
• Provide personalized tutoring
• Identify weaknesses in the classroom
THANK YOU!

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