How will AI and Data-Driven Learning Transform the Global Education Industry?

W. Lewis Johnson, PhD
Entrepreneur, thought-leader, researcher, published author in advanced educational methods & technologies

Applying artificial intelligence & gamification to education & training throughout his career

- Past president, International AI in Education Society
- Significant Technical Achievement Award, DARPA
- Co-winner, 2017 Autonomous Agents Influential Paper Award
- Guest speaker, International Conference on Intelligent Tutoring Systems
- Distinguished Lecturer, National Science Foundation
- Former director, Center for Advanced Research in Technology for Education at the University of Southern California

Speaks many languages, has coffee farm in Hawaii, mixes spirits (legally), sings opera

Linguistics: Princeton
Computer science: Yale
The market size of the global education industry exceeds $5tn

Sources: IBIS Capital, GSV Acceleration
Global shortage of skilled workers

45% of employers have difficulty filling jobs

Source: SIA
More States Opting To ‘Robo-Grade’ Student Essays By Computer

June 30, 2018 - 8:13 AM ET
Heard on Weekend Edition Saturday

TOVIA SMITH

Students work on computers in Henderson, Nev. Several states including Utah and Ohio use automated grading on student essays written as part of standardized tests.

John Locher/AP
Many technologies have claimed to revolutionize education
This time will be different

• The education market is starting to globalize
• It is ripe for innovation
• AI and data-driven learning are particularly powerful drivers for innovation
Educational institutions are starting to expand globally
Learning is becoming a lifelong pursuit

A college program that 'never ends'

Dive Brief:
- College that "never ends" may be the future, according to a Washington Post story describing a new University of Michigan program that offers scholarships for students to come back and take courses throughout their lives. It also describes a trend toward other online learning initiatives designed to re-educate or update workers.
- The program at Michigan's Ross School of Business offers 42 courses in leadership, marketing, human resources and finance that would normally
Online programs are seeking to scale up
Online programs are seeking to scale up

Startup VIPKID raises $500m


An employee of VIPKID addresses queries from online customers at the firm's headquarters in Beijing. [Photo provided to China Daily]

Fresh fundraising makes it largest online education company globally
Challenges for online learning

• Heavy reliance on passive media (PowerPoint, videos)
• Lack of opportunity to practice skills
• Online tutoring is labor-intensive and varies in quality
• Students can feel isolated and disengaged
• Giving machines the ability to seem like they have human intelligence
• AI as an intelligent assistant for:
  • Learners
  • Teachers
Capabilities of AI systems:
• Understanding: Collect, analyze and interpret data
• Decision-making: Take actions to achieve goals
• Learning
Nunan (1991) wrote, "success is measured in terms of the ability to carry out a conversation in the (target) language."

Example: Learning to speak a foreign language
Global Teaching Speaking Survey, Cambridge University Press
Why is it so difficult to teach speaking?

• Students don’t say anything
  • Cultural
  • Shy
  • Embarrassed
• Students revert to native language when practicing in groups
  • Activity Level
  • Mixed student levels
• Students make a lot of noise
• Takes too much time
• Difficult to provide feedback
AI now enables systemic learning solutions

1. Immersive practice environments
2. Formative assessments
3. Feedback
4. Personalized learning
5. Performance analytics for learners, teachers, & administrators
My name is Will. I'm doing a survey for the school newspaper.

Alright. How can I help?

Do you mind if I ask you some questions?

Okay, sure!

What do you like to do in your free time?

I guess I like to hang out with my friends. Usually we go out for dinner.
Feedback

Unfortunately, you weren’t able to say everything you needed to say in the conversation. Please review the information in the Feedback below and in the Practice Exercises that follow. That will help you to perform better on your next try. When you are ready, play again.

Ask when, where, and how often they take part in activities.

You didn’t quite ask the right questions to find out “when” and “how often” people take part in activities. Asking “when” indicates a specific time, while asking “how often” indicates that you want to know “how many times” during a given period.
Listen to what she says and respond.

Click the Play button to listen, then use the Record button to respond.

Well done!
You were able to talk about sports!
I heard: I play sports often
Learning with the end goal in mind

Formative Simulations → Personalized Practice → Summative Simulations
Data-driven development

Collect learner behavior & performance data

Deliver learning product

Train AI models – learn, analyze, formulate enhancements
Next: Data-driven teaching

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Next: Data-driven teaching
Teachers Matter: Understanding Teachers' Impact on Student Achievement

Many people emphasize the importance of good teachers, and many local, state, and federal policies are designed to promote teacher quality. Research using student scores on standardized tests confirms the common perception that some teachers are more effective than others and also reveals that being taught by an effective teacher has important consequences for student achievement.

Teachers matter more to student achievement than any other aspect of schooling.

Many factors contribute to a student's academic performance, including individual characteristics and family and neighborhood experiences. But research suggests that, among school-related factors, teachers matter most. When it comes to student performance on reading and math tests, a teacher is estimated to have two to three times the impact of any other school factor, including services, facilities, and even leadership.
Towards an AI-driven learning ecosystem

- AI embedded everywhere: data-driven course authoring, course delivery, data collection
- Integrate AI-driven learning into digital textbooks and other online learning products
- Leverage advances in AI tools, for learning purposes
- Support a global community of publishers & content developers using AI-driven tools
How will AI and data-driven learning transform the global education industry?

• Global learning providers will offer learning products to address critical skill gaps in the global economy
• Products will be high-quality, competency-based, and scalable
• Teachers will have intelligent aides that provide student analytics, automate menial tasks, and help them teach at their best
• Students will have learning companions that support them throughout their lifelong learning journey
Become a customer

Become a partner

Become an investor

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