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MEET THE MENTOR—Spotlight Session

Artificial Intelligence is the Future of Personalized Learning

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Speaker: **Scott Bolland**, Cognitive Scientist and Founder of New Dawn Technologies, Australia

Facilitated by: **Nivine Afiouni**, Chief Sub Editor, SkyNews Arabia

Summary Paragraph

Some studies show that up to 63% of students are disengaged because they are not operating at the periphery of their knowledge. After 20 years actively researching cognitive science Dr Bolland. is aiming to revolutionise education through the use of artificial intelligence as a tool for teachers. He sees artificial intelligence becoming a powerful tool for helping to personalize education and unlocking potential for positive human development.

Keywords: Technology

Key Points

Dr. Scott Bolland approached the issue of reaching out to disengaged students from a personal perspective. Describing his earlier self as C-average high school student who was regarded as partially brain damaged, he attributed his success—as a PhD holder with awards for academic excellence—to basic principles for learning that he discovered through the study of neuroscience.

Pointing to the anatomy of the brain, Dr. Bolland stated that the highest number of receptors for endorphins is in the learning centres of the brain, which means we are hardwired for joy





in learning. In fact, the learning centre is located near the part of the basal ganglia that regulates behavior and addiction, so we may even be addicted to learning.

“So why do so many kids struggle?” asked Dr. Bolland. “Because there is a mismatch between how we teach and how people actually learn.”

He pointed to what he called a ‘happy place’ for optimal learning, where we find joy in seeking new information at the periphery of our knowledge. “Things that are familiar are boring for the brain,” he explained, “and things that are too unfamiliar are stressful.”

In classroom situations, some students will therefore be bored, because they are already familiar with the material. Others will be stressed, because it is too unfamiliar, and only the ‘average’ students will have optimal learning, which leaves 63% of students unengaged.

“Most kids are stuck in a system that disempowers them,” said Dr. Bolland. He escaped this fate because he was passionate about computers from an early age. He advanced in technological knowledge, teaching himself every programming language at home while his grades languished at school. By the time he got to university, he was an expert with a passion for technology, and came into his element when he found a program that matched his interest.

“So how to engage kids?” he asked. “How can we personalize?”

Dr. Bolland advocated the use Artificial Intelligence as a technology for personalization, not to replace teachers, but to help students master the fundamentals. Personalized e-learning can use algorithms to create targeted lessons, freeing teachers to create deeper learning experiences.

The best types of learning for AI are rote and active learning, Dr. Bolland explained. Rote, or memorization learning, is usually achieved by ‘cramming’ for tests. There is an exponential forgetting curve, so although students can retain the information for the amount of time they need it—during an exam—they have not actually learned anything.

“Spaced repetition is the best way to learn something,” he said. “Re-learn the facts just as you’re about to forget them.” Active recall, with flashcards and quizzes, is how to retain information, and technology can do this quite simply. Programs can allow teachers to grade simple quizzes, and students can log in and see where their learning is for each topic. Programs can then also be taught to grade these rote learning quizzes.

Dr. Bolland then shared an AI tool he created when his son was thwarted in his desire to play the saxophone, and made to play the trumpet instead. When the teacher threatened to





expel his son from the class due to his lack of effort, Dr. Bolland made an AI program that tested pitch, breath control and music reading skill, and even composed its own music based on the user's skill level. The novelty of using the program won over his son, as well as the level of the lessons, which were in the 'happy place' described by Dr. Bolland at the beginning of his talk.

He then shifted gears, reducing the room to tears by screening a video depicting the dashed Olympic hopes of Derek Redmond, a favorite for the Gold in the 400 metre race in Barcelona. When Redmond's hamstring tore mid-race, his father fought through security to help his son cross the finish line. Dr. Bolland accompanied this video with a song, 'You Lift Me Up,' which he said illustrated how he saw the role of parents in children's lives.

"The brain is hardwired to respond to sound, so we have an emotional connection to tone and pitch," Dr. Bolland said, pointing to how mothers 'sing-song' when they speak with their babies. "When people sing together, it releases twice as much oxytocin than conversing," he went on, saying that teachers must use any tool available to make learning an emotional experience, since that is the only true way to motivate people.

He described the best teachers as belayers—those who support rock climbers, holding the rope, letting it out bit by bit as the climber ascends, and cinching it tight in the event of a fall. They are not holding the climber up, but following his or her progress closely. He described this role as becoming even more important with the advent of technology.

He concluded, "teachers must instill passion, empathy and emotional intelligence. I don't want to see teachers being replaced by AI, because I don't believe there's any heart there. Education is not the filling of a vessel, it's the kindling of a flame."

Scott Bolland: AI has great potential to individualize students and galvanize their passions, but teachers will always be key to inflaming students' passions.

