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CS 410

Technology Review

Topic: Identify some leading companies that use AI in the education domain. Explore the different problems being solved and the techniques being used.

Artificial intelligence is one of the most popular emerging technologies. It has a wide range of applications used to solve various problems. Companies are investing in the technology to improve their day to day operations, cut costs, and develop advanced solutions for their customers. One specific domain seeing an increase in the use of artificial intelligence is education. The technology is being used to help teachers, students, and other faculty members. According to a survey collected by education technology company Promethean, “76% of educators believe technology helps them do their job better.” This statistic displays the importance of delivering artificial intelligence powered technology solutions to educators. Companies all over the world are leveraging the technology to create applications for the education domain. Some are focused on certain age groups while others are focused on certain subjects. Two of the most popular applications in this domain are personalized learning plans and speech recognition systems. Knewton, a company based out of New York, is using the technology to create personalized learning plans. Nuance, a company based out of Massachusetts, is using the technology to create speech recognition solutions for both faculty and students.

One of the main applications of artificial intelligence in education is the use of speech recognition. It provides support to students who struggle with writing due to disabilities. It also

makes it easier for teachers and students to complete tedious tasks such as writing emails or taking notes. Speech recognition technology works by receiving audio input, analyzing the sounds, and using an artificial intelligence powered model to fit the sounds to the probable word. One big issue companies have faced when creating these solutions is handling the differences in the way that people talk. It's been challenging to create an application that supports both adult and child speech. Factors involved are pitch, vocabulary, and sentence structure which differ between the two groups. Nuance is a leading company in providing speech recognition applications across several industries. Their Dragon product is tailored for the education industry. According to their website, the software "allows you to write as fast and as fluently as you think." In addition to their software using speech recognition to transcribe, it can also be used to control the computer's mouse or navigate web pages. This is very helpful for those with disabilities. The product makes it easier for both students and educators to complete tasks such as completing homework or writing emails. Their website also states that the application delivers transcription 3x the speed of typing.

Another application of artificial intelligence in education is the creation of personalized learning programs. This technology analyzes a student's work and identifies knowledge gaps. Teachers can use the output of this system to better understand each student's learning abilities. It'll be easy for them to identify who is falling behind and who needs a greater challenge. For each student, it'll also identify which topics they need to spend more time studying. This helps teachers assign tasks that will provide the most benefit to the individual student. It also ensures that students are focusing their time on work that will help them decrease the knowledge gaps. The system works by receiving a student's data as input, comparing it to a set of previously received student data, and categorizing the student based off of the previously received data. A

large amount of student data is needed as input to help train the system before it can create personalized plans. This poses a big issue because students typically don't feel comfortable releasing their data. Knewton is a leading company in providing these solutions. According to their website, their learning platform "can quickly identify and dynamically boost knowledge gaps while you're completing assignments". Johns Hopkins performed a study on Knewton's Alta software to identify its effectiveness. According to their website, the study concluded that "Alta makes an impact on learning outcomes for students of all ability levels."

As artificial intelligence becomes more powerful, it's important for companies to expand and make use of the technology. It can help to cut costs, streamline daily operations, and provide support for a countless amount of tasks. This spans across different domains including education. Companies like Knewton and Nuance are leveraging the technology to create applications that support both students and teachers. In addition to the speech recognition and personalized learning program applications, there exists a number of other education related tasks that are incorporating the use of artificial intelligence. This includes creating interactive materials through augmented reality, tutoring for specific subjects, and advanced studying tools. Thus far, artificial intelligence has provided a tremendous amount of help for the education industry. Going forward, the main issues for this industry are obtaining student data and handling different user groups such as elementary vs college level students.

Works Cited

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