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The Role of Artificial Intelligence in Shaping the Future of Education: Transforming Teaching in the Modern World

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Abstract

This paper examines the need for a new education system that delivers quality education by integrating AI technology to transform traditional teaching methods. The global education system is currently confronted with critical questions about the true effectiveness and qualifications of teachers in schools and colleges. Despite formal credentials, there remains a significant gap in student satisfaction with conventional teaching approaches. This study explores the current state of teacher qualifications and student satisfaction, highlighting the increasing role of AI in education and demonstrating how AI can revolutionize the way education is delivered.

Keywords: Artificial Intelligence, Education

Introduction

Artificial intelligence (AI) is rapidly expanding, reshaping various fields, and influencing societal perspectives on technology. The evolution of AI techniques reflects changing viewpoints and an increasing recognition of AI's potential. Education, a fundamental pillar of societal development, remains a critical factor in individual success. However, the effectiveness of education systems is often questioned, particularly regarding whether teachers and professors are adequately meeting the needs of students. Not all students have access to high-ranking universities, raising concerns about the quality of education provided. This disparity prompts a deeper examination of the role of qualified teachers and the potential of AI to address educational challenges.

Qualified Teachers

A qualified teacher is defined as someone who is well-trained in a specific field and capable of teaching students in that area. However, this definition often exists more in theory than in real-life teaching scenarios. To secure a teaching position, candidates typically need to meet the following requirements:

- **Bachelor's Degree** (B. Ed): Enroll in a two-year Bachelor of Education program to acquire essential knowledge, skills, and practical experience in teaching.
- **Specialization:** Choose a specialization in areas such as special education, secondary education, middle-level education, or early childhood education.
- **Teaching Internships:** Gain hands-on experience through teaching internships, where you apply what you've learned in real classroom settings.

- **Certification**: Obtain the necessary teaching certification, which qualifies you to teach in your chosen field.

Globally, approximately 90% of primary and secondary education teachers meet the qualifications required to be in their profession. However, a significant percentage of teachers and college professors are dissatisfied with their jobs. Many of them are in the profession not out of passion, but out of necessity, working primarily to earn a salary and support their families. The unemployment rate has risen by 9.2%. At the same time, the education sector is expanding rapidly, with over 200 million students enrolling in universities and schools each year. This growth not only underscores the increasing demand for education but also drives a higher demand for teaching jobs. As a result, some individuals who struggle to find employment in other fields often end up becoming teachers.A significant number of qualified teachers and professors are not effective in their teaching roles. As a result, a large number of students are dissatisfied with their teachers. Another observation is that the percentage of students who dislike their teachers often mirrors those with a negative attitude toward school overall. This trend is also evident in college settings.Many teachers, despite having passed numerous tests and completed various projects are not truly qualified to teach or effectively share knowledge. Teaching is an art that requires time and dedication to master. This art should not be practiced at the expense of our younger generations, who deserve the best possible education. Teachers should not only be academically qualified but also genuinely connect with and inspire their students. There are situations where a teacher may understand the answer to a question or have knowledge about a particular topic but lacks the ability to effectively teach it to students. This often results in students understanding only a fraction of what is explained. We live in a society where students sometimes feel humiliated or singled out when they ask questions, which discourages them from seeking clarification on topics they don't fully understand. It's important to recognize that being good at learning does not necessarily equate to being good at teaching

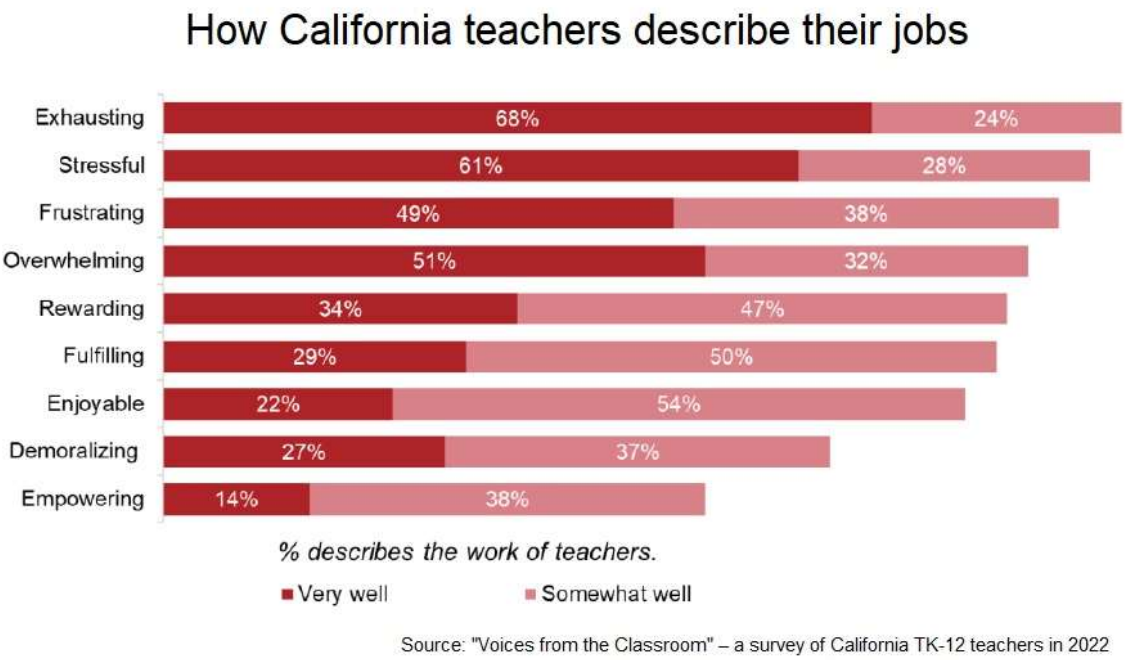


Figure 1. How Teachers Describe Their Jobs

Figure 1 reveals a troubling perspective among teachers, with many describing their jobs as overwhelming, frustrating, and exhausting. This negative outlook indicates that these teachers may struggle to deliver

quality education, potentially affecting students' learning experiences and future prospects. For teachers facing such challenges, effective teaching remains elusive, which could jeopardize student success and future opportunities. In contrast, a well-trained AI or humanoid robot could offer more consistent support and training for teachers, potentially improving the quality of education without the same issues.

Why Artificial Intelligence?

Artificial Intelligence (AI) is the most rapidly advancing technology of our time, permeating every aspect of life—from medicine and engineering to education and countless other activities. Cutting-edge tools like ChatGPT, Adobe AI for images, and AI-generated videos represent a new wave of innovation that could soon become one of the most transformative developments in the last century of technological progress.
AI models can be trained in various ways to understand different scenarios and deliver remarkable outputs. These systems can converse with humans, often articulating thoughts more effectively than people themselves. Moreover, AI programs continuously improve with use; for example, ChatGPT can already suggest potential diagnoses based on symptoms provided by users. In the near future, this technology could advance to handle complex tasks, such as surgical procedures. Its applications are already widespread across various fields, including autonomous vehicles, smart home devices, supply chain optimization, sentiment analysis, cybersecurity, speech recognition, and image recognition.

Can AI Become a Qualified Teacher?

As AI technology advances, the idea of AI serving as a teacher is becoming more plausible. It's not just about the teaching style; it also hinges on the depth of knowledge. A human teacher, even after years of training, can't match the vast knowledge base of an AI program connected to the internet. Imagine an AI program designed specifically for teaching, properly trained and connected to the internet with access to virtually all information. Such an AI could teach any topic, cover any syllabus, and discuss almost anything in the universe without hesitation. This would enable the AI to effectively teach any subject, whether at the school or college level, potentially revolutionizing education as we know it.For instance, if a student asks ChatGPT about the Pythagorean theorem, it would provide a clear and concise definition like this:
"In a right-angled triangle, the square of the hypotenuse's length (the side opposite the right angle) is equal to the sum of the squares of the lengths of the other two sides."
This straightforward explanation demonstrates how AI can deliver accurate educational content in an easily understandable form.However, if the student is new to the Pythagorean theorem and doesn't understand the initial explanation, they could ask something like, "Can you explain the Pythagorean theorem in a very simple way using an example with balls?" In response, GPT could instantly provide a clearer, more relatable explanation, such as:

Imagine this:

- You have three different balls: one big ball and two smaller balls.
- The big ball represents the **hypotenuse** (the longest side) of a right-angled triangle.
- The two smaller balls represent the **other two sides** of the triangle.

Here's how it works:

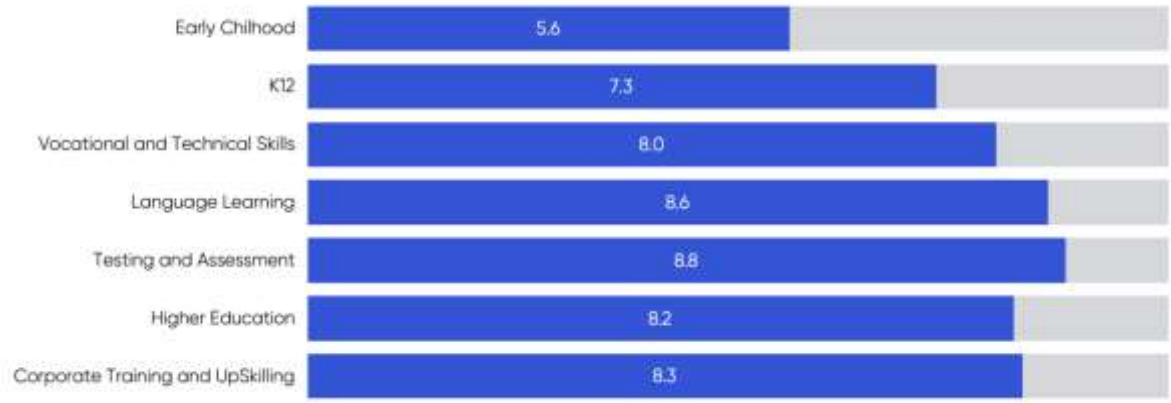
- Imagine that the big ball is so big that it could be cut into two smaller balls, each equal in size to the smaller balls you have.

- Pythagoras' Theorem is like saying that if you take one smaller ball, make it into a square (by thinking of its size), and do the same with the other smaller ball, the total size (or area) of these two squares would exactly equal the size (or area) of the square made from the big ball.

This version of the explanation is much easier for a student to grasp compared to the first one. While a human teacher can certainly offer similar examples, it's not always guaranteed that the perfect analogy will come to mind at the exact moment the student asks a question. There might be instances where the teacher's example doesn't quite help the student understand the concept. In contrast, GPT can provide multiple examples within seconds, offering different perspectives until the student fully comprehends the idea. In 2023, Hanson Robotics unveiled Mika, the world's first AI to serve as a CEO, leading a Polish rum company. Mika's role encompasses generating creative ideas, identifying business opportunities, and managing operations for the rum and gin brand. This groundbreaking achievement highlights that if an AI can excel in such a complex position, it holds great promise for the field of education. AI systems like Mika have the potential to revolutionize the global education sector, fundamentally transforming teaching and learning practices worldwide.

Impacts

Figure 2 . Impact of AI Technologies on Different Education Markets



Source: HolonIQ, February 2023. n = 464 across both 2019 Aug-Sep Survey and 2022 Aug-Sep Survey

Figure 2 highlights a growing concern regarding the increasing use of AI tools among young people. Rather than allowing these tools to be used in isolation, which can diminish critical thinking and creativity, it's essential to integrate AI into their daily lives in a constructive manner. By doing so, we can support young minds in developing their skills and using AI to enhance their learning, rather than merely copying content generated by these tools. Technical skills, assignment completion, and language training should be guided by skilled educators to ensure students don't rely solely on AI for their work, which could negatively impact their learning environment and overall educational experience..

Conclusion

The concept of AI teachers is not intended to replace human educators but to enhance their efforts, particularly for students who struggle to reach their full potential. This approach is especially valuable for students who may lack access to inspiring or effective guidance from their teachers.

While a diverse range of individuals is essential in every profession, there are instances where some may fall short of their goals or fail to drive positive change. Not all students dislike their teachers, and many educators are fully committed to their roles. However, the increasing number of ineffective teachers can

impede progress and innovation in education. AI can help bridge these gaps, ensuring that every student has the support they need to succeed.

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