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Thematic Insights: Edutainment

Artificial Intelligence in Education: AI + HI = ROI

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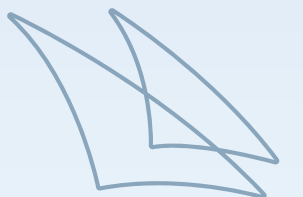
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Generative text is something we all need to adapt to... We adapted to calculators and changed what we tested for in math class, I imagine. This is a more extreme version of that, no doubt, but also the benefits of it are more extreme as well.

Sam Altman,
CEO, and co-Founder of OpenAI¹

In this Thematic Insight, we investigate the impact of artificial intelligence (AI) on Education, concluding that it is likely, along with human interaction (HI), to have an overall positive impact on educational outcomes and return on investments (ROI) in the sector. Nevertheless, there could be negative consequences for certain business models as well as job losses, especially among lower-skilled professionals.

¹ Gizmodo Article; published on 20.01.2023, [link](#); retrieved on May 24, 2023.



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An earthquake with an aftershock

The launch of a chatbot, ChatGPT, by OpenAI in November 2022, introducing its large language model (LLM) to consumers, had a seismic effect on many sectors, including Education. In short, it became the fastest growing consumer application in history, reaching 100 million subscribers within just two months after launch.²

In April, we attended ASU-GSV,³ one of the largest education conferences, with over 7,000 attendees,⁴ many of whom were teachers worried about potential job losses due to the threat AI could pose to their profession. Most of the sessions discussed the impact of ChatGPT, showing us that AI will remain a dominant topic for the sector for a while, overtaking fundamental considerations for many stocks.

A real aftershock for the sector came in May 2023 when Chegg, a prominent edtech company, admitted that ChatGPT is having a negative impact on its customer growth.⁵ The subsequent stock reaction over the following week was severe, both in the education and the career mobility segments. Most notably, Chegg's share price fell ~42% and 2U's price dropped ~26% in the education technology space, while Fiverr fell ~26% and Upwork slumped ~16% in the career mobility space.⁶



The individuals mentioned above only conduct regulated activities in the jurisdiction(s) where they are properly licensed, where relevant. The companies mentioned above are meant for illustration purposes only and are not intended as a solicitation or an offer to buy or sell any interest or any investment.

² <https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/>, retrieved 31.05.2023.

³ Annual summit initiated in 2010 by collaboration between Arizona State University (ASU) and Global Silicon Valley (GSV); aim of connecting people focused on transformation of society/business in the topics of learning and work

⁴ ASU-GSV summit sold out, retrieved 31.05.2023.

⁵ "In the first part of the year, we saw no noticeable impact from ChatGPT on our new account growth and we were meeting expectations on new sign-ups. However, since March we saw a significant spike in student interest in ChatGPT. We now believe it's having an impact on our new customer growth rate." Chegg CEO on Chegg's 1q 2023 earnings, retrieved 31.05.2023.

⁶ Bloomberg, performances from 01.05.2023 to 05.05.2023 in USD, retrieved 31.05.2023.

Cheating or an efficiency tool?

To demonstrate the "benefits" of cheating we asked ChatGPT to write the subsequent section. After several attempts and our help directing the conclusions, the title, and the tone of the article we obtained the following outcome:

AI + HI = ROI: Maximizing Efficiency and Enhancing Education through AI Integration (by ChatGPT)

Introduction:

The integration of Artificial Intelligence (AI) in education brings forth numerous benefits, including increased efficiencies, enhanced learning experiences, and improved return on investments (ROI). This article explores the positive impact of AI in education from various perspectives, such as teaching assistants, educators, students, and investors. While acknowledging the potential for job transformation, it emphasizes the importance of maximizing efficiency while preserving the value of human interaction (HI) in education.

1. Empowering Teaching Assistants and Enhancing Efficiency:

AI technology empowers teaching assistants by automating administrative tasks, enabling them to focus on personalized guidance, adaptive instruction, and meaningful student interactions. This collaboration between AI and teaching assistants improves efficiency, allowing educators to maximize their impact on student learning outcomes.

2. Enriching Educational Experiences for Students:

AI algorithms facilitate personalized learning experiences, adaptive tutoring, and data-driven insights into student performance. Teaching assistants leverage AI tools to provide targeted interventions, support individualized learning paths, and foster student engagement. The combination of AI-powered tools and human interaction enriches educational experiences, promoting effective learning and growth.

3. Investor Perspectives: Driving ROI through Efficiency:

The implementation of AI in education drives operational efficiency, reduces costs, and enhances educational outcomes. By automating administrative processes, optimizing resource allocation, and leveraging data analytics, institutions can improve ROI and provide a more efficient and effective educational environment. AI integration presents opportunities for investors to contribute to the growth and innovation of the education sector.

Conclusion:

The integration of AI in education presents immense potential for maximizing efficiency and enhancing education. While acknowledging the potential for job transformation, the focus remains on optimizing processes, improving learning experiences, and achieving a positive ROI. AI empowers teaching assistants to provide personalized support, adapt instruction, and foster student engagement. It enables institutions to drive efficiency and make data-informed decisions. By embracing the benefits of AI while preserving the value of human interaction, education can undergo transformative improvements, benefiting educators, students, and investors alike. The continuous pursuit of efficiency and innovation through AI integration ensures a future-ready education system that prepares learners for success in a rapidly evolving world.

In our view, the article feels a little too mechanical and the general tone is too positive. However, by outsourcing the time-consuming writing to ChatGPT, we saved time and, under our guidance, we received a decent outcome supporting the main points that we were trying to make:

- Empowering teachers by freeing up their time from administrative tasks, allowing them instead to focus on students, and therefore improve educational outcomes.

- Enriching the learning experience for students, which again improves outcomes.
- Improving investor returns through efficiency.

From the students' perspective, they would have learned how to use a very useful tool that they will most likely have to leverage on in their future careers. And they also know that they are still required to understand and learn the material to pass exams.

Co-pilot for teachers freeing up their time to focus on human interaction with students

The most obvious advantage for teachers is the ability to outsource many administrative tasks to ChatGPT, such as developing lessons, generating exercises or drafting emails, allowing them instead an uninterrupted focus on students. To demonstrate this functionality, we asked ChatGPT to plan a high-school history lesson about the French Revolution for us.

Lesson Topic: The French Revolution: Causes, Events, and Impact (by ChatGPT)

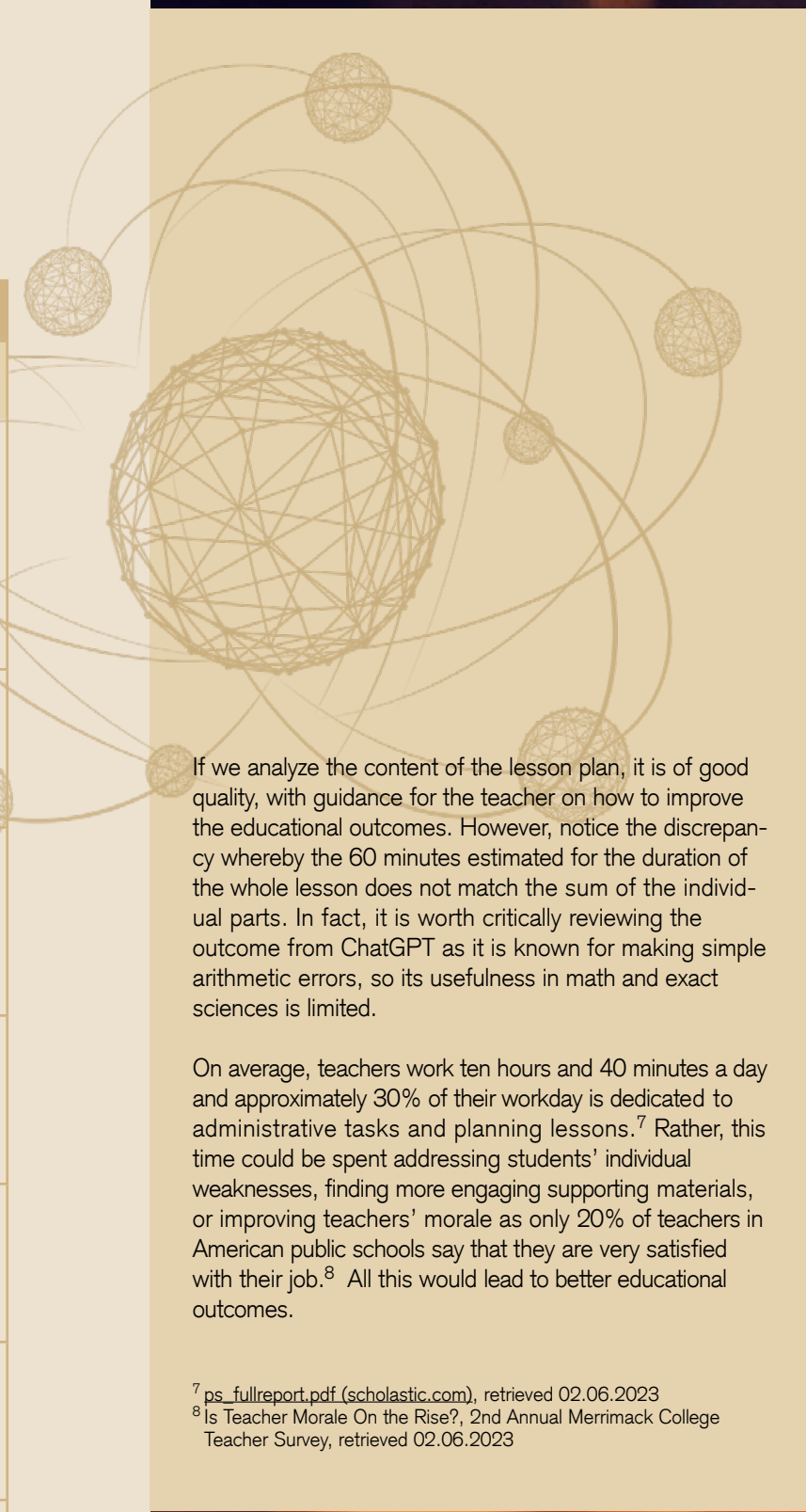
Objective: To provide students with an understanding of the causes, key events, and the impact of the French Revolution, enabling them to analyze its significance in shaping modern France and its influence on global history.

Duration: Approximately 60 minutes

Lesson Outline:

- 1. Introduction (5 minutes)**
 - Begin the lesson by engaging students in a discussion about revolutions and their significance in history.
 - Highlight the importance of the French Revolution as a major turning point in world history.
- 2. Historical Context (10 minutes)**
 - Provide an overview of the political, social, and economic conditions in France leading up to the revolution.
 - Discuss factors such as the absolute monarchy, the Estates system, economic inequality, and Enlightenment ideas that contributed to the revolutionary sentiment.
- 3. Causes of the French Revolution (15 minutes)**
 - Present the primary causes of the French Revolution, including financial crisis, social inequality, Enlightenment ideals, and political discontent.
 - Discuss the role of influential figures such as Maximilien Robespierre and Jean-Jacques Rousseau in shaping revolutionary thought.
- 4. Key Events of the French Revolution (25 minutes)**
 - Discuss the major events of the French Revolution, including the Estates-General, the storming of the Bastille, the Reign of Terror, and the rise and fall of Napoleon Bonaparte.
 - Explore the significance of each event, its impact on the course of the revolution, and its implications for French society.
- 5. Legacy and Impact (10 minutes)**
 - Examine the long-term effects of the French Revolution on France and the wider world.
 - Discuss the establishment of a republic, the spread of revolutionary ideals, and the impact on subsequent revolutions, nationalism, and the development of modern political systems.
- 6. Analysis and Discussion (5 minutes)**
 - Encourage students to analyze the causes, events, and consequences of the French Revolution.
 - Engage students in a class discussion about the significance of the revolution and its relevance to contemporary society.
- 7. Conclusion (5 minutes)**
 - Summarize the key points covered in the lesson.
 - Encourage students to further explore the French Revolution through additional readings or research.
 - Highlight the importance of understanding historical revolutions and their impact on shaping societies.

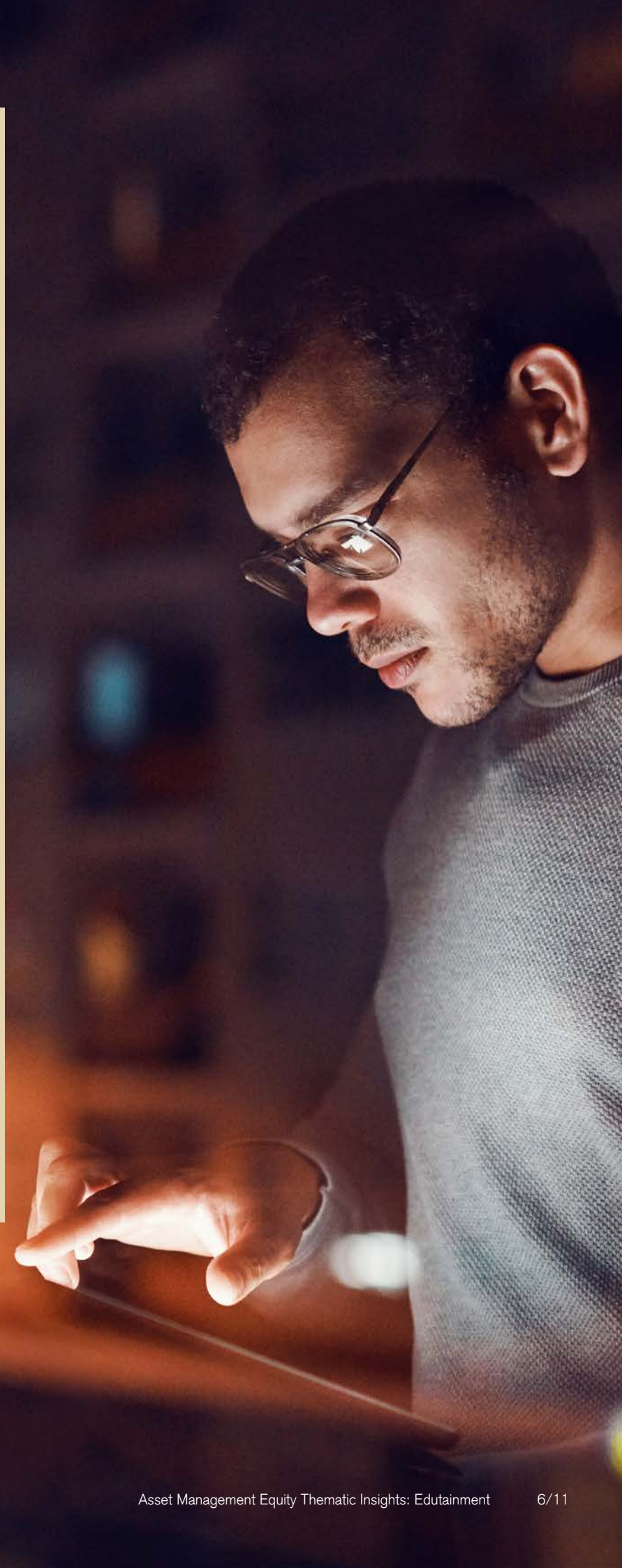
Note: The above lesson outline is a general framework, and it can be adjusted based on the specific needs of the class, available time, and the level of understanding of the students. Visual aids, primary source documents, and interactive activities can be incorporated to enhance student engagement and deepen their understanding of the French Revolution.



If we analyze the content of the lesson plan, it is of good quality, with guidance for the teacher on how to improve the educational outcomes. However, notice the discrepancy whereby the 60 minutes estimated for the duration of the whole lesson does not match the sum of the individual parts. In fact, it is worth critically reviewing the outcome from ChatGPT as it is known for making simple arithmetic errors, so its usefulness in math and exact sciences is limited.

On average, teachers work ten hours and 40 minutes a day and approximately 30% of their workday is dedicated to administrative tasks and planning lessons.⁷ Rather, this time could be spent addressing students' individual weaknesses, finding more engaging supporting materials, or improving teachers' morale as only 20% of teachers in American public schools say that they are very satisfied with their job.⁸ All this would lead to better educational outcomes.

⁷ [ps_fullreport.pdf \(scholastic.com\)](#), retrieved 02.06.2023
⁸ [Is Teacher Morale On the Rise?, 2nd Annual Merrimack College Teacher Survey](#), retrieved 02.06.2023



Job losses or efficiency gains?

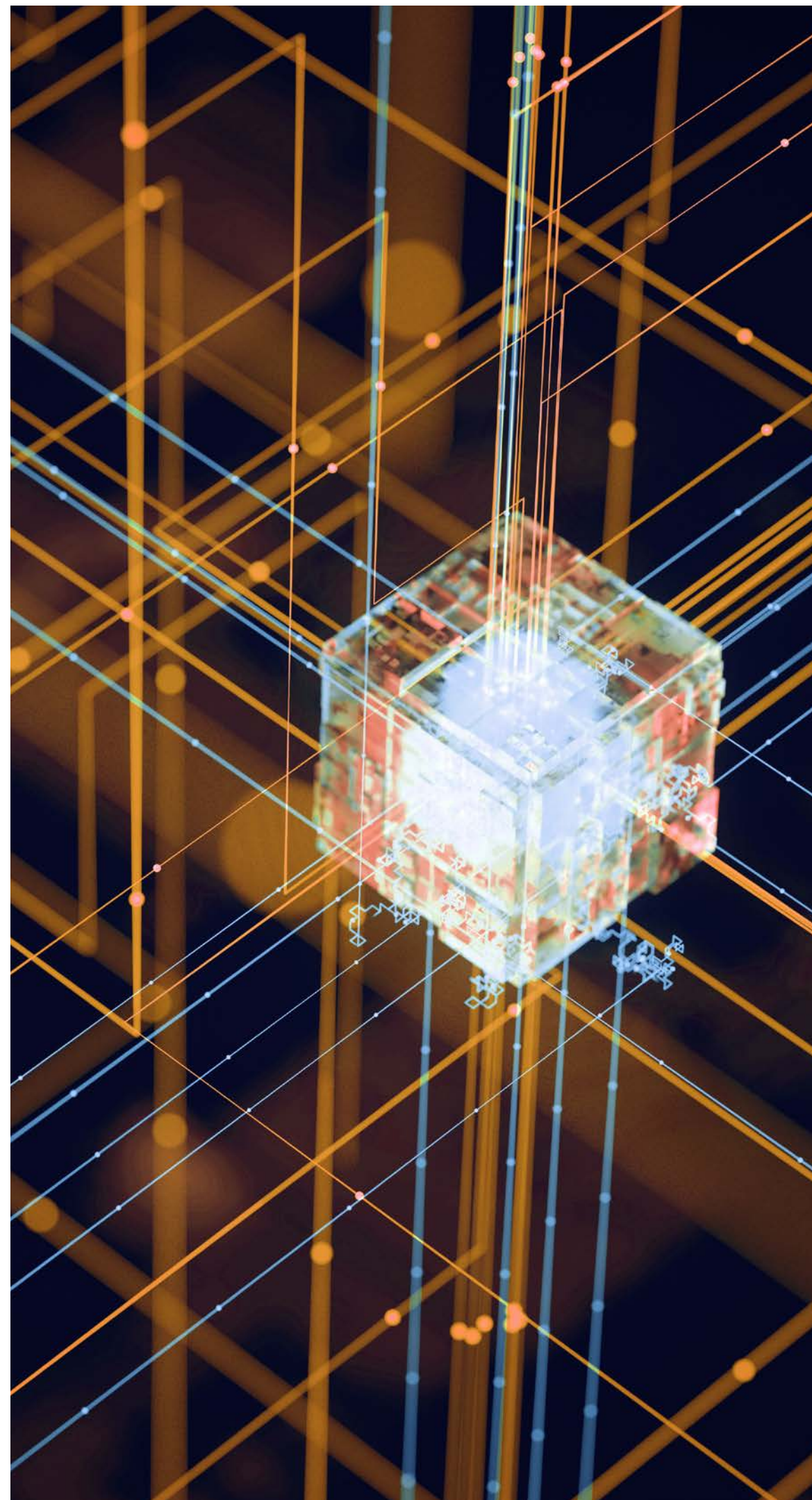
As teachers' time could be saved from some administrative tasks, there could be a temptation to increase their workload, for example, by assigning more classes to the same teacher. That could relieve some pressure on the industry to find new teachers, which is a major issue, as many teachers retired during the COVID-19 pandemic on health and stress grounds.⁹ For investors in the education sector, that would mean higher returns as costs savings and efficiency gains would push margins higher. This effect would be most noticeable for companies having high labor costs pushing margins down.

With a shortage of 69 million teachers around the world, we think that schools are unlikely to get rid of qualified teachers, and therefore the fears of large layoffs in the education sector are unwarranted.¹⁰ Rather, we believe that outsourcing administrative tasks to an AI-powered platform would make the profession more rewarding, as teachers would focus more on human interaction and on finding the "individual key" to each student. In many cases, this was the exact reason why they would have chosen the profession in the first place, as none of them would have become teachers to spend their weekends marking papers or filling in administrative forms. However, we can see some pressure on entry-level teaching assistants, who used to perform those mundane tasks, to either upgrade their skillset and become qualified teachers or re-train for another industry.

The share prices for Fiverr and Upwork, who supply freelance workers, many in the IT field, also fell on Chegg's admission. Here, an argument could be made that the world would not require as many coders if elements of a code can be written by AI. On the flip side, we could make the argument that now every company in the world is looking at how to incorporate AI into their products or services, and so there will be an even greater need for IT professionals who understand and know how to use AI. Coders will be much more productive if they use AI to create standard pieces of code and could instead focus on designing complex structures and inventing new applications. As a result, their jobs may well become more interesting and fulfilling.

⁹ For example, see [DOE US Department of Education](#), retrieved 31.05.2023

¹⁰ [World Teachers' Day: UNESCO sounds the alarm on the global teacher shortage crisis | UNESCO](#), retrieved 02.06.2023



AI+HI = ROI

From discussions with the management of our portfolio companies, we know that this is already happening. For example, a US tutoring company highlighted several benefits of AI:

- Better student retention from having a lesson plan for every lesson. Before ChatGPT emerged, it was a struggle to get tutors to prepare lesson plans, but students do appreciate it.
- Better tutor retention as preparation for lessons takes less time.
- Access to additional free content to cover 3,000 subjects that they teach.
- Better sales productivity with the use of AI for training and replacing sales scoring previously performed by a call centre with AI.
- Cost savings from the elimination of that call centre and some coding jobs as up to 30% of the code is now produced by AI.

Overall, through better retention, costs savings and productivity gains, the company was able to improve the lifetime value of its services and reach earnings before interest, taxes, depreciation, and amortization (EBITDA) profitability ahead of the plan.

Conclusion

We believe that AI is a revolutionary efficiency tool which will greatly increase the productivity of many workers, as the calculator once did for engineers, using the example from Sam Altman's quote. It will also improve the job satisfaction of many professionals, allowing them to focus on more complex and therefore professionally more rewarding tasks. Specifically, teachers who today spend about 30% of their time on administrative tasks including planning lessons, will be able to dedicate more of their time to human interaction with students, which for many was the precise reason why they joined the profession. This will lead to better educational outcomes. At the same time, we think that the fear of significant job losses among teachers are exaggerated given the 69 million shortage of qualified teachers post-COVID-19. Finally, AI is antiinflationary, which should relieve pressure on margins that some companies in the sector experienced with the tight job market. This should be particularly visible for companies with low margins due to a high labor component. The same is true for the other sectors that had to deal with the shortage of labor, especially low-skilled labor.

Credit Suisse Asset Management has designed several highly focused strategies to provide clients with "pure-play"¹¹ exposure to a number of compelling long-term secular growth themes, such as Robotics & Automation, Security & Safety, Infrastructure, Digital Health, Infrastructure, Edutainment, Environmental Impact and Energy Evolution.

¹¹ With the "pure-play" concept, we mean companies which have at least 50% in revenues directly attributable to the corresponding theme.

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