



Engineering Students' Perception of AI Replacing Human Skills in Future Technical Careers: A Survey Study

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Abstract: The survey looked at what students know about what Artificial Intelligence can do. It also looked at how confident students are in things that only humans can do, such as thinking critically, being creative, making good judgments, and working well with others. The survey wanted to see what students think about Artificial Intelligence taking jobs versus Artificial Intelligence helping with jobs. Early results show that although most students agree with the improving abilities of AI in performing monotonous and analytical tasks, a great number are confident about the irreplaceable nature of complex human mental and emotional abilities. Nonetheless, there is some concern about job displacement in occupations requiring highly repetitive technical skills. There is also an observable relationship between AI knowledge and optimistic career prospects, indicating that AI instruction could.

Keywords: Artificial Intelligence, Engineering Students, Career Perception, Skill Displacement, AI Literacy, Future of Work, Human Skills, Career Anxiety, Technical Education, Workforce Disruption

I. INTRODUCTION

While the discourse around AI and employment has grown substantially in recent years, most existing research approaches the topic from an economic, organizational, or policy perspective, leaving a significant gap in understanding the lived perceptions and emotional responses of engineering students themselves. Current literature largely overlooks how students in technical disciplines interpret AI's capabilities relative to their own developing skill sets, how they balance awareness of disruption with confidence in their career trajectories, and whether their formal education is adequately equipping them to navigate these challenges.

Artificial Intelligence is moving fast and it is totally changing the way businesses work. Artificial Intelligence is changing the way businesses work. Things that people used to do are now being done by machines. We see robots and software doing all sorts of things like testing code looking at a lot of data and even making decisions on their own. It is amazing how many tasks have gone from people to the Artificial Intelligence algorithms.

The workforce is changing now. People over are wondering if they still have useful skills in areas like engineering. The engineering field is about solving problems designing things and coming up with new ideas. Now the engineering field is right in the middle of this change. All the things engineers learn to build in school those same tools, are being used to make their jobs easier or even replace some parts of their jobs.

Now it is normal for Artificial Intelligence to do things like write code simulate circuits, run tests and check the quality. Three years ago, new engineers used to do these things. Now machines can do them faster with mistakes and for less money. This is really happening now. Big tech companies are hiring graduates because many simple tasks are being automated by Artificial Intelligence. The numbers show this is true. Signal fire said in 2025 that Artificial Intelligence automation was one of the reasons, for the drop. Artificial Intelligence is really changing everything.



II. LITERATURE REVIEW

Balta-Salvador and their team published a study in 2025 in the International Journal of STEM Education. This study is similar to the research they did. They used the Social Cognitive Career Theory to understand how 14 recent engineering graduates in industries think Artificial Intelligence affects their careers. These engineering graduates shared their views, on Artificial Intelligences impact.

The study found that even though Artificial Intelligence had a breakthrough in 2023 there is still no way to teach Artificial Intelligence in engineering and computer science classes.

The study found this even after Artificial Intelligence had a breakthrough in 2023.

As a result, recent engineering graduates have to adapt to changing industry needs on their own.

The team looked at how these engineering graduates handle the changing demands of their industries.

Balta-Salvador and their team looked at how these recent engineering graduates handle the changing demands of their industries and Artificial Intelligence.

Engineering students in Latin America have feelings about using artificial intelligence tools.

A study that was published in MDPI Behavioural Sciences in the year 2025 looked at how engineering students at an university in Chile felt about artificial intelligence.

This study is important because it shows what happens in a developing country.

The people who did the study asked one hundred and seventy engineering students questions.

They used a kind of questionnaire that had some questions with fixed answers and some questions that were open.

The people who did the study looked at the answers to see how many students used intelligence and if they thought it was useful.

A study by Intuition Labs in 2025 showed that when the economy gets tough companies start using Artificial Intelligence. This really affects people who are just starting their careers with Artificial Intelligence. The people at Intuition Labs did this study by talking to people who do the hiring looking at job postings and asking students from around the world about Artificial Intelligence. They found out that there are not jobs available for people who are just graduating from college. It is tough, for these graduates because of Artificial Intelligence.

Otermans and others in their 2024 study published in Frontiers in Artificial Intelligence did a survey that's very relevant to our research.

The researchers looked at how students use AI tools what they believe about AIs role in their careers and if they know about their university's AI policies.

The study by Otermans et al. Helps fill a gap in understanding what students think about AIs impact on their careers.

III. METHODOLOGY

We went with a quantitative survey for this study, reaching out to engineering students through an online questionnaire. Over, 120 students from various departments—Artificial Intelligence and Machine Learning, Computer Science Engineering, Electronics and Communication Engineering, Mechanical Engineering, and Information Science Engineering participated in it.

The survey aimed to know about how students feel about AI. We checked about their awareness of new technologies, whether they're worried that AI might take over technical jobs, their confidence about working in AI-based industries, how much they value human skills in future careers, and their interest in doing up AI-related skills.

For data, our questionnaire having multiple-choice and opinion-based questions. Everything was collected digitally.

Here's the process:

1. We prepared the questionnaire.
2. Sent it out to engineering students.
3. Gathered their responses.
4. Analysed patterns in what they said.
5. Put it all into graphs.
6. Interpreted the results.

Some questions from the survey:

- Are you aware of recent AI advancements?



- Do you think AI could replace software engineers in the future?
- Which human skill is hardest for AI to replace?
- Are you planning to learn AI-related technologies?
- Do you believe AI will create more jobs than it removes?

SURVEY ANALYSIS AND RESULTS

We took all those responses and ran a statistical analysis to get a genuine feel for what engineering students think about AI and their future in technical fields.

1. Awareness of AI Technologies

Out of 120 students, a 92% said they're aware of recent developments in AI. In short, engineering students know their stuff when it comes to applications and emerging technologies.

2. Fear of AI Replacing Technical Jobs

We asked if they think AI will start to replace technical jobs. Here's how it played out:

- Yes: 41%
- No: 27%
- Partially: 32%

Most students figure AI is likely to take over repetitive roles, but it still can't cut people out completely.

3. Human Skills Difficult for AI to Replace

We wanted to know which human skills they feel AI just can't touch:

- Creativity: 35%
- Emotional Intelligence: 28%
- Leadership: 20%
- Critical Thinking: 17%

Most agree—creativity and emotional intelligence are still uniquely human.

4. Interest in Learning AI Skills

A big 88% said they're interested in learning AI tech; only 12% weren't. They're not just waiting for change—they're adapting to it.

5. Confidence in Future Careers

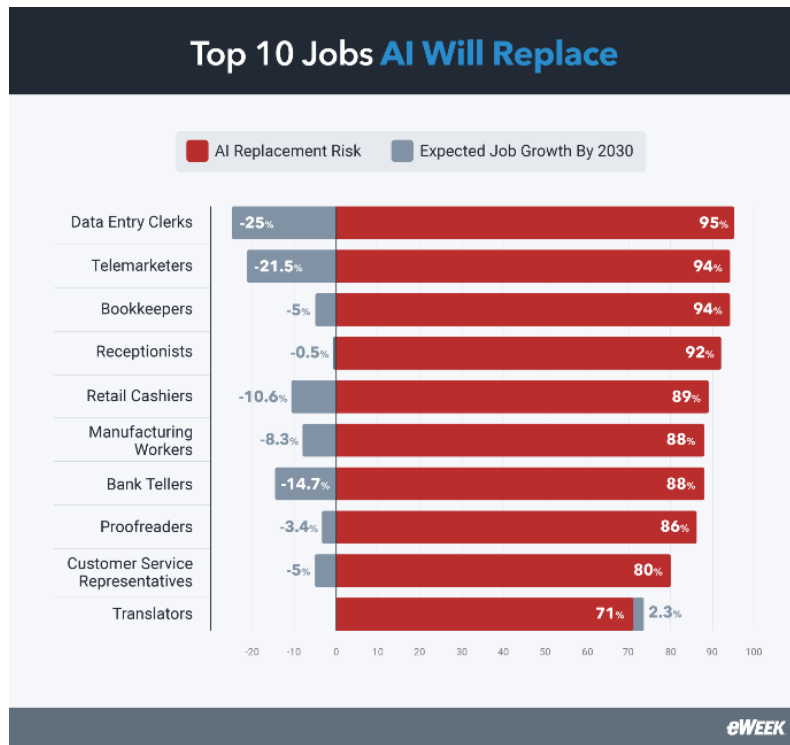
We asked if students feel confident about their careers, even with AI in the mix:

- Highly confident: 38%
- Moderately confident: 46%
- Not confident: 16%

There's plenty of optimism, as long as they keep working on the skills that matter.

IV. EXPECTED OUTCOMES

This study dives into the real feelings and reactions of engineering students as AI reshapes careers.



Here's what we're expecting:

- Students get more aware of how AI affects engineering jobs.
- We find out what's stressing students about automation.
- People start appreciating human-based skills a lot more.
- Students get inspired to learn about AI.
- The research shines light on what's coming for the workforce.

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5 REASONS WHY AI CAN'T REPLACE HUMANS

Read the article below. Did you mention any of these reasons? Do you agree with them? Why? Why not?

AI lacks emotional intelligence

Emotional intelligence is one distinguishing factor that makes humans forever relevant in the workplace. As social animals, one basic, most important need of humans is the need for emotional connection with our kind. We achieve this connection through the chemical and biological interaction of several hormones and emotions between the people involved. AI does not possess it as it has software and chips, not biological cells.

AI can only work with inputted data

AI can only function based on the data it receives. Anything more than that would take on more than it can handle, and machines are not built that way. So, when the data inputted into the machine does not include a new area of work, or its algorithm does not include unforeseen circumstances, the machine becomes useless. Human reasoning and the human brain's power to analyze, create, improvise, maneuver, and gather information cannot easily be replicated by AI.

Humans make AI work

There would be no artificial intelligence without human intelligence. The term artificial intelligence means humans design it. Humans write the lines of code with which AI is developed. The data AI machines operate with are inputted by humans. And it is humans that use these machines. Someone has to design the machine's AI processes, create these machines, operate, and maintain them. Only humans can do this.

AI does not have soft skills

Soft skills are a must-have for every worker in the workplace. They include teamwork, attention to detail, critical and creative thinking, effective communication, and interpersonal skills, to mention but a few. However, soft skills are alien to machines with artificial intelligence. AI cannot develop these soft skills critical to workplace development and growth. Developing these skills requires a higher level of reasoning and emotional intelligence.

AI is meant to complement human ability and intelligence

Artificial intelligence applications are becoming more and more popular in the workplace, and they will replace many jobs people perform today. However, the jobs AI takes are limited to repetitive tasks requiring less intense reasoning. Additionally, evolving workplace demands will create new roles for humans as the world moves towards a more integrated tech future.

Honestly, we hope colleges mix AI training with real-life essentials—like communication, creativity, ethics, and leadership—to get students ready for whatever comes next.



V. CONCLUSION

AI isn't here to replacing engineers—it's here to help them do more. AI's changing engineering jobs fast. From the survey, most students see AI as both a worry and a boon. Sure, AI can handle routine stuff, but nobody's convinced it can match skills like creativity, empathy, leadership, or ethics—those are still believed as human emotions.

Students aren't running away from AI, they're broadening their skill set. Engineers won't compete against AI—they'll work with it. Schools have to prepare students for this, giving them hands-on AI practice, more creative space, and putting soft skills front.

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BIOGRAPHY



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