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Expanded abstract

Level of attachment to artificial intelligence in university students

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ABSTRACT

Artificial Intelligence (AI) is currently a widely used tool, but confusion between humans and computers could lead to erroneous behaviors and attitudes. Specifically in the field of education, AI can be a powerful tool, but its application carries a risk when it invades human functions. This article proposes the concepts of "Level of Attachment to AI," "Attributions of Human Qualities," and "Catastrophic Ideas about AI." It presents the results of a series of studies conducted over the past three years with the aim of thoroughly understanding these concepts, as well as the implications that over-involvement and excessive dependence on this new technology could have. The results show significant levels in each of the categories, which encourages further study, as well as the development and implementation of measures aimed at the healthy adoption of AI techniques and tools.

Keywords: level of attachment, artificial intelligence, university students

1. Introduction

In recent years, especially after the pandemic, the use and abuse of technology, social media, and recently, artificial intelligence have generated two major poles among professionals in various fields [1], especially mental health. A large group supports its use and utilization in moderation to enhance education, entertainment, and communication from a very early age, while another important sector views its incorporation with caution, wary of its potential harm to communication, creativity, and even people's mental health.

Artificial Intelligence (AI) is now a widely used tool, and the development of this technology has reached the point where it can now be used without a deep understanding of the technology. It's now possible to use AI on a computer or mobile phone without having a clear understanding of what it is or how it works, similar to driving a car without any mechanical knowledge.

Indeed, to take advantage of a tool, it's not necessary to know how to build or repair it, and in many cases, knowing how to operate it may be enough. But in the case of AI, simply knowing how to operate it isn't enough, because this technology is capable of emulating some unique human behaviors. For this reason, it's necessary to thoroughly understand what AI is and what it's used for.

A good way to begin to understand the true essence of AI is to remember that this name was coined in 1956 when a group of scientists led by John McCarthy, Minsky, and others, met [2] at Dartmouth College in New Hampshire, USA, to try to establish the domain of knowledge in which they worked and coined the term AI to refer simply to the possibility of machines exhibiting intelligent behavior. The so-called "artificial intelligence" is not intelligence, but rather intelligent behavior, the fruit of natural human intelligence.

Human intelligence is truly intelligence; it is the ability to reason and to read things deeply. How-

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ever, when we talk about AI, its essence is a machine—circuits, software, or other things—but ultimately, it is not intelligence. Its essence is electronics and mechanical parts. Although it may appear to be an animal, like a kangaroo or an android, although it may have a physical appearance when it speaks (or rather, when it simulates speaking), it is nothing more than machines and in no way animals or artificial people, because their essence simply cannot be changed.

Confusion between humans and computers could lead to computers and robots being given powers that are exclusively human. This leads to erroneous behaviors and attitudes.

American psychologist Jonathan Hidt [3] has strongly promoted the idea that excessive use of screens is producing a significant increase in depression and perceived anxiety disorders among the new generation, and that it is urgent to reverse this phenomenon. The proliferation of terms such as robophilia, robophobia, and syndromes such as Hikikomori seem to support this cautious view. Research studies are looking at phenomena such as the romantic and sexual relationships of a recent number of adolescents and young adults with AI, through specific applications [4, 5].

At our institution, a collaborative effort has been proposed between the schools of Engineering, Humanities, and Psychology to thoroughly understand the level of attachment, erroneous beliefs, and attributions of human qualities, as well as the implications that the over-involvement of younger generations and their excessive dependence on this new generative tool could have.

Specifically in the field of education, AI can be a powerful tool to support the teaching-learning process, but the problem begins when AI invades human functions.

A first risk lies in the fact that this technology is capable of performing activities that students necessarily need to perform and experience as a fundamental part of their learning. For example, having the AI solve exercises assigned to the student to practice, or having the AI conduct bibliographic research and write an essay instead of having the student practice searching for information and structuring their ideas, etc. The quality of the work produced with AI may be excellent, but it loses sight of the main objective: for the student to learn and grow through practice activities. Proceeding in this manner prevents the student from practicing and developing their skills.

A second risk exists in the way students interact with the various people involved in the learning process. The use of technology can be of great help in supervising, advising, and supporting students, especially in cases where physical presence is difficult or impossible (due to distance) or personal attention (due to time constraints or the number of students). However, the support of a machine, no matter how useful, timely, pertinent, and warm, will never be comparable to the relationship between people. Except in the case of self-study, the success of the educational process depends largely on the way students interact with their teachers and peers.

2. Methodology

The first step was to define the categories of interest, and then move on to developing the questionnaire and finally proceeded to conduct studies to estimate the category levels.

2.1 Definition of interest categories

The following three interest categories were defined to assess their respective levels during the studies:

- Level of Attachment to AI
- Attributions of Human Qualities
- Catastrophic Ideas about AI

The Level of Attachment to AI category [6, 7, 8, 9, 10] refers to the signs and symptoms of AI dependence or addiction. Most people show a mix of attachment and dependence towards technology, especially in caring for devices and the need for constant connection. However, not everyone feels emotionally attached or dependent on technology, and many can use it without experiencing too much perceived anxiety or impairment.

It is important to mention that from the very first meetings, the team debated whether the first category, or the development of an excessively close bond with AI, should be called "attachment" or "dependence." Although the term "attachment" is associated with the attachment between two human beings (according to Ainsworth and Bowlby's initial attachment theory), finding articles in the literature detailing frames of reference and even degrees of "attachment to technology" and Artificial Intelligence contributed to defining the concept in this study as "AI Attachment."

The category of Attributions of Human Qualities [11] is an indicator of the confusion between humans and machines. This category is associated with the perception of Artificial Intelligence as a technology dependent on and controlled by humans, lacking the autonomous capacity to develop intentions, emotions, or judgments. It allows for an analysis of the existence or absence of a practical and controlled vision of AI, viewing it as a tool under human control, ruling out the possibility of the technology evolving to the point of posing human risks.

The category of Catastrophic Ideas about AI is associated with fears of a potential negative, even catastrophic, impact of AI on humanity. This relates to issues such as concerns about job replacement and the challenge of upskilling, concerns about data privacy and security, distrust of AI's creativity and emotional intelligence, and opinions about AI autonomy and human control.

2.2 The questionnaire

The 25 questionnaire items were originally written by the research team, ensuring their appropriateness for

measuring each category. The questionnaire was reviewed by five experts, professors of research methodology and instrument validation. A pilot test was then conducted with 30 students, whose opinions were taken into consideration, and any necessary adjustments were made before administering the survey.

The following are the items associated with the Level of Attachment to AI category:

- When I interact with an AI, I feel I can explore new ideas or questions without fear of judgment.
- I feel that AI is a reliable source of information when I need help.
- I frequently use AI to understand myself and grow as a person.
- In difficult times, I often seek the company of an AI to feel better.
- I believe that an AI can effectively provide emotional support.
- I feel I cannot complete a school assignment without first consulting an AI for advice.
- It causes me stress when I want to use an AI and cannot for some external reason.
- The thought that AIs might stop working or be banned causes me anxiety.
- I believe that if I tell an AI about my problems, it can respond empathetically.
- I believe that AI chats can foster bonds that users perceive as friendships.

The following are the items associated with the Attributions of Human Qualities category:

- When I face emotional difficulties, I prefer to share my problems with an AI rather than talking to friends or family.
- I enjoy spending time with an AI and actively seek out opportunities to interact with it.
- I would like to have an AI near me in social or stressful situations.
- I find comfort in having constant access to an AI, even when I don't need it at the moment.
- I believe that AI has the ability to learn and evolve autonomously, similar to humans.
- I believe that artificial intelligence can develop its own intentions without the need for human intervention or programming.
- I believe that AI expresses value judgments (opinions) based on the information it processes.
- In the future, machines will be like people, with their own ways of being and a place in society.
- As technology advances, machines should be granted certain labor rights.
- I tend to be kind to artificial intelligences and use words like "please" and "thank you" when interacting with them.

The following are the items associated with the category of Catastrophic Ideas about AI:

- I believe that society should limit the development of artificial intelligence to avoid the risk of it dominating humans in the future.
- I believe that in the future, machines will outnumber human workers in businesses and healthcare services.
- I think some AI applications could pose a security risk to humanity.
- I believe that artificial intelligence will allow humans to enjoy greater well-being and more free time by reducing their workload.
- I believe that AI will drive human evolution.

2.3 Description of the studies carried out

All the studies mentioned here were conducted at Anahuac Mayab University, in Merida, Yucatan, Mexico.

Starting in August 2022, a preliminary study was conducted with a group of students, asking them five questions that asked whether they "felt capable of establishing emotional relationships with a robot," whether they were afraid that robots would one day take over the world or take our jobs, among other questions. The results of this initial study showed clear indications that encouraged further research.

Later, and more formally, a research team made up of teachers and students began meetings with the aim of developing projects that would help gain a deeper understanding of these issues starting in August 2023. That year, the team designed a 10-item questionnaire and set out to evaluate categories such as "robophilia and robophobia index" and "level of erroneous beliefs about AI" among 100 students surveyed.

During this semester, from January to May 2025, the team refined and piloted the instrument and defined a meaningful sample. Considering the University's population of 8,500 students, the sample was established at 380 students surveyed. With the support of the Department of Educational Innovation, faculty members were selected to reserve the first 10 minutes of their classes for team members to administer the instrument, and the 380 surveys were completed for convenience. The team met to capture and obtain results, as well as present them to a group of faculty members and the vice-rector's office, with the goal of disseminating the findings presented here.

Table 1. Attachment dynamics

Level	Percentage
Low	49%
Medium	43%
High	8%

Table 2. Attribution of human qualities

Level	Percentage
Low	37%
Medium	54%
High	9%

3. Results and Discussion

After the first questionnaire was administered in 2023, it was found that 43% of the students surveyed had a severe level and 42% a moderate level of erroneous beliefs about AI.

In subsequent years, 2024 and 2025, the teams, with new students, focused these concepts more on "Catastrophic Beliefs" and "Attribution of Human Qualities to AI." And the instrument was refined to focus a greater number of items on the "Level of Attachment to AI" category. It was also found that 75% of the students surveyed did not have an extreme level, but 20.7% had extreme robophilia rates, and 4.3% had extreme robophobia rates in the sample studied.

This year, in May 2025, after reformulating the questionnaire, a total of 25 items were included, using a 5-point Likert scale, from "strongly disagree" to "strongly agree", 10 for the category "Level of attachment to AI", another 10 items for the category "Attributions of human qualities" and 5 items for a final category, "Catastrophic ideas about AI".

The overall results confirm that 8% of the total number of students surveyed have attachment levels considered extremely high, as can be seen in Table 1.

Likewise, in relation to the attribution of human qualities, 9% of the students surveyed have high levels, as can be seen in Table 2.

And 31% of participants showed a high rate of catastrophic beliefs about AI, as shown in Table 3.

4. Conclusion

In conclusion, AI is a very practical and widely used tool, but it's not enough to simply know how to use it; it's also necessary to clearly understand what it is and what it's used for. So-called AI is not intelligence itself; rather, the term refers to the construction of machines and programs that exhibit intelligent behavior. AI is a powerful tool that should always be used to contribute to a person's growth and fulfillment, never to limit, stunt, diminish, or enslave them. Specifically in the field of education, AI should not be used to prevent students from exercising their skills, nor as a substitute for the teacher's personal work as a fundamental part of supervision, counseling, and mentoring activities.

This article presents the results of several studies conducted over the past three years aimed at understanding levels of attachment to AI, as well as attribution of human qualities and the existence of catastrophic ideas about AI. The results of the studies show significant levels in each of these categories.

Future work includes conducting a more in-depth study of the student population, as well as developing and implementing measures aimed at promoting the healthy adoption of AI techniques and tools.

Ethics Statement

The authors acknowledge that ethical approval was not obtained for this study. The authors take full responsibility for any ethical considerations and are willing to cooperate with post-publication review if necessary.

CRediT authorship contribution statement

José J. Karam: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Supervision, and Project administration. **Gabriel Urzaiz:** Conceptualization, Writing – original draft, Writing – review & editing, and Supervision.

Declaration of Generative AI and AI-assisted technologies in the writing process

This manuscript was written without the assistance of generative AI tools. All content, including figures and text, was produced by the authors. The authors confirm that no generative AI or AI-assisted tools were used during the preparation of this article.

Declaration of competing interest

The authors declare no competing interests.

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Table 3. Catastrophic ideation

Level	Percentage
Without ideation	69%
With ideation	31%

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