# In Machines We Trust: Anthropomorphism's Role in the Subtle Erosion of Human Expertise

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**ABSTRACT**
Advancements in AI have taken the entire world by storm in the past decade. We see people using AI and technology for every small and simple work even with higher trust and greater ease, without realizing the simultaneous decrement happening in their cognitive and creative capacity. It has become increasingly easy to pass off work done by AI as original work with progressively human-like capabilities of modern AI tools. High trust in AI capabilities and exceedingly anthropomorphized human-like characteristics predict greater chances of the reuse of AI technology by humans. The increasing use of AI has the potential to both augment and deskill among humans. The study analyzed responses from 172 participants (101 men and 71 women) to address the rising concerns of use of AI and Deskilling being indulged in by students. The study utilized a survey method consisting of questions from established questionnaires regarding anthropomorphism and human-computer trust and a scenario reaction test to gauge the impact on deskilling of students. Results show that higher anthropomorphism and trust in AI were linked to higher levels of deskilling. The dangers of continued AI usage and possible safeguards have been discussed.

**Keywords:** human-computer trust, trust in AI, deskilling, anthropomorphism.

## INTRODUCTION

Artificial intelligence (hereafter AI) has seen tremendous growth in research and public attention over the past few years. Modern life is dominated by AI, which makes it possible to use smart technologies and apps. The advent of AI-driven chatbots is not new, as they have been used in multiple sectors such as health [1], education [2], customer care [3] and official work [4]. Some major reasons for this rapid development include advancements in different fields of AI, such as natural language processing (NLP) and natural language understanding (NLU), natural language generation (NLG), deep learning, and different types of chatbot designs like retrieval-based methods and generation-based methods. Artificial intelligence (AI) systems, which draw their inspiration from human intelligence, improve their capacity to learn, reason, self-correct, and sometimes mimic human decision-making [5, 6]. The growth of AI technologies can be definite as to "... make humans and society faster, better, stronger and happier" [7] and is every so often labelled as a 'positive power' in research.

Additionally, different levels of autonomy provided by AI technologies reduce the need for human monitoring or control. Many AI-enabled gadgets also have humanistic traits and natural language processing capabilities, transforming them into social actors [6]. Concerns regarding AI's applications and claims have been raised due to its influence and widespread use. Researchers have shown concern that if present patterns continue, there is a good chance that moral problems like accountability and discrimination will arise in the future [8].

### Dispositional Factors, Trust, and Usage of AI

The recent spike in the usage of AI to assist in completing assignments and other academic work raises critical questions about which types of students use such assistance and which do not. This brings us to explore the role of dispositional factors and their connection with trust and the use of AI tools. With the aid of artificial intelligence (AI), students can finish their coursework, including writing assignments and presentations, with little cognitive strain. Their output and efficiency may rise as a result, but not their cognitive or learning skills, which call for much more rigorous training to develop or strengthen.

Deskilling can be one outcome of extensive use of AI in the students. Deskilling is the process by which a human's depth and quality of knowledge to carry out a particular task, or more broadly, a job, can steadily decline when they get assistance from AI at work [9, 10]. Because AI use has been shown to lower professionals' confidence and knowledge across a range of professions, it becomes problematic when making decisions. Furthermore, the decision results are worse since the technological system overpowers the user and People lose their ability to simultaneously store information in their minds when they become dependent on search engines [11, 9]. The degree to which people use AI and deskill can be influenced by a certain dispositional factor (anthropomorphism) and their level of trust in artificial intelligence.

Anthropomorphism is the attribution of human-like features to non-human entities. With the advent of AI and its integration into daily life through various presentations, such as robots, and virtual or embedded forms, this notion has attracted greater attention from researchers [12]. Several studies have found that anthropomorphizing AI has various effects on its use. The degree of trust and reliability an AI can produce is determined by how human-like it appears [13, 14].

When people expect, AI will act without considering the artificial agent's intentions or morality, we can say there is trust in AI. In their evaluation of 35 empirical publications, Glikson and Woolley [15] observe that the form in which the AI is presented (robotic, virtual, or embedded) and its level of intelligence or capabilities are crucial determinants of the growth of human user confidence. The writers divide the trust into two categories: cognitive and emotional trust. They claim that cognitive trust is formed by an AI based on its tangibility, transparency, reliability, and immediacy actions, whereas emotional trust is built on the AI's anthropomorphism.

Deskilling is the progressive loss of knowledge or abilities brought about by professional advancements that lead to automation. Automation increases productivity and efficiency by enabling workers to complete tasks with less training, but it also brings up many new problems.

**The rationale of the study**

This study is being conducted in response to growing worries about the (out-of-control) growth of AI. The man recognized as the godfather of AI, Geoffrey Hinton, recently left his position at Google after developing the neural network that served as the foundation for well-known AI-powered chatbots like ChatGPT, Bing, and Bard. This presents a severe risk to the integrity of written and researched material presented by authors as their original work and passes any plagiarism checks in the context of academia. Students can now employ these extremely sophisticated AIs to complete their tasks when they are required to conduct research, write essays, develop presentations, or produce photographs, videos, or audio.

Students who rely on ready-made finished products of such AI might observe a decline in their academic abilities and knowledge levels. The present research is conducted with the vision to explore and understand that the level of acceptance and trust in AI is developing ease and dependency among users for all those things which they were doing, are supposed to and AI can do it for them.

**Hypothesis**

H1: Trust in AI will significantly influence deskilling.

H2: Anthropomorphism will significantly influence deskilling.

**Method**

**Participants**

This research examines students' interactions, attitudes, and trust in using AI for academic purposes. A final set of participants included 172 higher education students. The sample consisted of 71 female and 101 male participants. The researchers utilized purposive sampling, and participants were selected based on availability and consent. These responses have been collected using Google Forms.

**Measurements**

The final set of instruments includes the following measures:

1. Trust in AI: Keeping in mind the relative newness and the contextual meaning of the concepts, the questionnaire to assess trust in AI is developed based on a literature review and existing instruments to assess human-computer trust, trust of automated systems test, and some other relevant instruments. The final scale includes 12 items. The reliability analysis result with the present sample for the scale was satisfactory ($\alpha$=.81).

2. Deskilling: As per the conceptualization and operational definition of deskilling, five items were developed with the help of relevant literature. The reliability analysis result with the present sample for the scale was satisfactory (α=.79).
3. Anthropomorphism: Suitable items were selected from Individual differences in the anthropomorphism questionnaire [16] and the perceived anthropomorphism scale [17]. The final scale includes 12 items. The reliability analysis result with the present sample for the scale was satisfactory (α=.83).
4. Demographic Information: Information regarding participant's age, gender, education, and frequency of AI use were also collected.

**Procedure**

The study followed the general ethical guidelines in accordance with the American Psychological Association (2017). The participants' informed consent was achieved after explaining the Study's idea, operation, and utility in terms of introduction on the first page of Google form. Respondents voluntarily completed the questionnaires. The participants were assured and informed that the purpose of the study is purely academic. Potential respondents were given guarantees of confidentiality to promote truthful responses.
Demographic questions were included at the start of the questionnaire. In contrast, the inquiries related to interest variables were randomly distributed to avoid respondent fatigue bias.

**RESULTS AND DISCUSSION**

The present study tried to explore the data-driven understanding of the relationship between the use of AI and the potential for deskilling. Responses received from the participants were analyzed quantitatively and presented below to explain the specific contribution of trust in AI and anthropomorphism in deskilling.

**Table 1.** Correlation among variables under study

| | **Trust in AI** | **Anthropomorphism** | **Deskilling** |
|---|---|---|---|
| Trust in AI | 1 | .471** | .424** |
| Anthropomorphism | .471** | 1 | .432** |

**p < .01.

Results of correlation analysis revealed that trust in AI and anthropomorphism are significantly positively correlated. There is a significant positive correlation between Trust in AI, Anthropomorphism, and deskilling.

**Table 2.** Stepwise regression analysis of the Trust in AI-Deskilling

| **Predictor variables** | **R** | **R square** | **R Square Change** | **Beta** | **t** | **Significance** |
|---|---|---|---|---|---|---|
| Trust in AI | .424 | .180 | .180 | .424 | 6.105 | .000 |

*p < .05; **p < .01.

Result revealed that trust in AI predicted 18% variance in deskilling. The degree of trust a human being places in the findings produced by AI systems can have a significant impact on future behaviour surrounding use of AI [18]. They developed a two-factor model of trust in the same study: human-like trust and functionality trust. The authors revealed that the effects of trust, perceived usefulness, convenience of use, and attitude had an overall effect on the desire to utilise AI services in the future. Using AI continuously provides a shortcut to reach desired outcomes without learning and practicing the process to reach which eventually will lead towards fading the capacities to perform these tasks at the human level.

**Table 3.** Stepwise regression analysis of the Anthropomorphism-Trust in AI

| **Predictor variables** | **R** | **R square** | **R Square Change** | **Beta** | **t** | **Significance** |
|---|---|---|---|---|---|---|
| Anthropomorphism | .471 | .221 | .221 | .471 | 6.954 | .000 |

*p < .05; **p < .01.

A similar set of results is found in context to the prediction of trust in AI by anthropomorphism positively predicted at 22.1%. Recognition and attribution of human qualities in AI lead to trusting AI as a competent and dependable tool to serve the desired purposes. Anthropomorphism has also frequently been linked to trust in AI. According to studies, when an agent is embodied, people are more likely to trust it since they can more easily recognize its social presence. [19, 20].

**Table 4.** Stepwise regression analysis of the Anthropomorphism - Deskilling

| Predictor variables | R | R square | R Square Change | Beta | t | Significance |
|---|---|---|---|---|---|---|
| Anthropomorphism | .432 | .187 | .187 | .432 | 6.247 | .000 |

*p < .05; **p < .01.

Results indicated that anthropomorphism predicted 18.7% of the variance in deskilling. Anthropomorphism is facilitative in the acceptance of AI for various analytical and creative tasks which may put the person in the comfort zone of enjoying and claiming the result of AI operations as their own. Excessive anthropomorphism can lead to deskilling. If users start to treat anthropomorphized AI or robots as if they were entirely human, they may become overly reliant on these systems for tasks that they should be able to perform independently.

**CONCLUSION**

Results clearly indicate that people with higher levels of trust in AI and anthropomorphism are more likely to experience deskilling. People who exhibit higher levels of anthropomorphism may also exhibit higher levels of trust in AI. Furthermore, these individuals may be more likely to rely on AI for tasks they could previously do on their own, which could lead to deskilling.

When people use AI for tasks like mathematics, language translation, or data analysis, they may gradually lose proficiency in these areas. The ease of searching for information using AI-powered search engines can lead to a decline in information retrieval skills. Individuals may rely on quick searches rather than developing strong research and information-gathering capabilities.

Relying heavily on AI for cognitive tasks may lead to deskilling in some areas. For instance, constant use of AI-driven spell checkers and grammar correction tools may lead to decreased proficiency in language and writing skills. Individuals who depend on AI for mathematical calculations might lose some of their mathematical problem-solving abilities over time.

If individuals use AI to make decisions or solve problems without understanding the underlying logic, it can lead to reduced critical thinking skills. They might become dependent on AI's recommendations without questioning or evaluating them.

In essence, the increasing use of AI can lead to deskilling among humans, depending on the context and the approach taken. Addressing these challenges requires a proactive approach that combines education, skills development, ethical considerations, and collaboration with AI to ensure that humans remain adaptable, skilled, and capable in an increasingly AI-driven world.

To maximize the benefits and mitigate potential negative effects, it's crucial to strike a balance between leveraging AI as a tool to augment cognitive capacities and preserving or enhancing essential cognitive skills through education, critical thinking, and ongoing learning.

**Limitations and Future Directions**

While not invalidating the results of the present study, some of its limitations should be mentioned. As this is a work in progress the current sample size is relatively small, results are basedupon the voices of set of homogenous students. This research could be more impactful with a large and varied sample and if possible, with hybrid methodology triangulating sampling and analysis method. Considering the clear and encouraging results of the present analysis a proof of concept is presented here; further studies may include a larger and more representative sample from organizations of different types and students of varying levels and courses from all over the country. Further research is needed to understand the causal mechanisms behind these relationships and to develop strategies for mitigating the negative impacts of AI on human cognition and behaviour.

**Behavioral Science Implications**

Some implications of this study are the need for awareness of deskilling as a result of repeated use of AI in cognitive contexts. This could involve encouraging students to use AI tools as a supplement to their work rather than as a total substitute. Replacing their work with AI-generated outputs could lead to the

deterioration of their learning, cognitive, and creative skill development. Finally, addressing the issues of dependency on AI by teaching ethical behaviour as part of the upcoming school curriculum could be considered as a safeguard against the future detrimental impact of increased AI usage.

**REFERENCES**


[1] Vaidyam, A. N., Wisniewski, H., Halamka, J. D., Kashavan, M. S., & Torous, J. B. (2019). Chatbots and conversational agents in mental health: a review of the psychiatric landscape. The Canadian Journal of Psychiatry, 64(7), 456-464.

[2] Hobert, S., & Berens, F. (2020). Small talk conversations and the long-term use of chatbots in educational settings–experiences from a field study. In Chatbot Research and Design: Third International Workshop, CONVERSATIONS 2019, Amsterdam, The Netherlands,November 19–20, 2019, Revised Selected Papers 3 (pp. 260-272). Springer International Publishing.

[3] Adam, M., Wessel, M., & Benlian, A. (2021). AI-based chatbots in customer service and their effects on user compliance. Electronic Markets, 31(2), 427-445.

[4] Meyer von Wolff, R., Hobert, S., Masuch, K., & Schumann, M. (2020). Chatbots at digital workplaces- a grounded-theory approach for surveying application areas and objectives. Pacific Asia Journal of the Association for Information Systems, 12(2), 3

[5] Russell, S. J., Norvig, P., Davis, E., & Edwards, D. (2016). Artificial intelligence: A modern approach (Third edition, Global edition). Pearson

[6] Watson, D. (2019). The rhetoric and reality of anthropomorphism in artificial intelligence. Minds and Machines, 29(3), 417–440. https://doi.org/10.1007/s11023-019-09506-6

[7] Mikalef, P., Conboy, K., Lundström, J., & Popovič, A. (2022). Thinking responsibly about responsible AI: Theorizing and researching from the dark side.

[8] Vallor, S. (2015). Moral deskilling and upskilling in a new machine age: Reflections on the ambiguous future of character. Philosophy & Technology, 28, 107-124.

[9] Mishra, A., Cao, C., & George, J. (2019, September). IT Induced Employment Irregularities and Deskilling: Impacts on Temporary Worker Welfare. In Fortieth International Conference on Information Systems, Munich.

[10] Rinta-Kahila, T., Penttinen, E., Salovaara, A., & Soliman, W. (2018). Consequences of discontinuing knowledge work automation-surfacing of deskilling effects and methods of recovery.

[11] Sutton, S. G., Arnold, V., & Holt, M. (2018). How much automation is too much? Keeping the human relevant in knowledge work. Journal of emerging technologies in accounting, 15(2), 15-25.

[12] Björling, E. A., Rose, E., Davidson, A., Ren, R., & Wong, D. (2020). Can we keep him forever? Teens' engagement and desire for emotional connection with a social robot. International Journal of Social Robotics, 12(1), 65-77.

[13] Koesdwiady, A., & Fathoni, A. (2020). Anthropomorphism effect on human-AI trust in a decision support system. Journal of Big Data, 7(1), 1-17.

[14] Troshani, I., Rao Hill, S., Sherman, C., & Arthur, D. (2021). Do we trust in AI? Role of anthropomorphism and intelligence. Journal of Computer Information Systems, 61(5), 481-491.

[15] Glikson, E., & Woolley, A. W. (2020). Human trust in artificial intelligence: Review of empirical research. Academy of Management Annals, 14(2), 627-660.

[16] Waytz, A., Cacioppo, J., & Epley, N. (2010). Who sees human? The stability and importance of individual differences in anthropomorphism. Perspectives on Psychological Science, 5(3), 219-232.

[17] Moussawi, S., & Koufaris, M. (2019). Perceived intelligence and perceived anthropomorphism of personal intelligent agents: Scale development and validation.

[18] Choung, H., David, P., & Ross, A. (2023). Trust in AI and Its Role in the Acceptance of AI Technologies. International Journal of Human–Computer Interaction, 39(9), 1727-1739.

[19] Kim, K., Boelling, L., Haesler, S., Bailenson, J., Bruder, G., & Welch, G. F. (2018, October). Does a digital assistant need a body? The influence of visual embodiment and social behavior on the perception of intelligent virtual agents in AR. In 2018 IEEE International Symposium on Mixed and Augmented Reality (ISMAR) (pp. 105-114). IEEE.

[20] Shin, D. (2022). The perception of humanness in conversational journalism: An algorithmic information-processing perspective. New Media & Society, 24(12), 2680-2704.