

From Code to Character: Investigating Personality in Generative AI-Driven Educational Avatars

Gunver Majgaard, Maria Skougaard Andersen

University of Southern Denmark, Odense, Denmark

gum@mmmi.sdu.dk

maran@mmmi.sdu.dk

Abstract: As generative artificial intelligence (GAI) continues to shape digital learning environments, AI-driven conversational agents are emerging as effective tools for enhancing student engagement and motivation. These avatars often functioning as virtual tutors or learning companions can be imbued with distinct personality traits, significantly influencing user experience and educational outcomes. This study investigates the role of personality in AI avatars used for learning, with a focus on six positive traits intelligent, sincere, sociable, approachable, creative, and joyful and two negative traits offensive and artificial.

We developed a digital prototype consisting of eight unique personality profiles. The prototype takes the form of a chatbot powered by a large language model, enhanced with personality-driven responses. A formative user test was conducted with 15 engineering students, aiming to explore how personality traits influence students' willingness to engage in conversations with AI avatars. The learning objectives aimed to equip students with practical insights into how avatar personality shapes user interaction, develop their skills in conducting technical evaluations collaboratively, and encourage critical reflection on communication strategies used in large language models.

During the test, participants interacted with four of the eight personality types. The results indicate that students spent significantly more time interacting with the avatars than anticipated, to the extent that the sessions had to be concluded after 40 minutes. This suggests that personality-rich avatars are highly engaging, new and inspiring for this target group. Students reported increased motivation and a sense of connection during the interactions, highlighting the potential of personality-driven AI in educational settings.

Future research directions include refining real-time personality adaptation mechanisms, investigating cross-cultural differences in avatar perception, and examining the long-term effects of avatar personality on learner behaviour and academic performance.

This paper contributes to the growing body of research on AI in education by emphasizing the psychological and pedagogical importance of avatar design. The findings offer practical implications for educators, instructional designers, and AI developers seeking to harness the motivational potential of AI-driven learning companions.

Keyword: Emerging Technology, Generative Artificial Intelligence (GAI), Avatars, Personality traits, Educational technology, AI, LLM, Chat bots.

1. Introduction

This paper explores how GAI-driven avatars such as Duolingo's AI tutor, Duolingo Max (n.d.) can enhance learner engagement and educational outcomes through the deliberate design of personality traits. As GAI continues to reshape the landscape of educational technology (Majgaard, 2024), these systems are increasingly embodied in conversational agents (CAs): GAI-powered avatars capable of engaging in near-natural dialogue with learners, particularly in the context of language learning.

Emerging technology refers to early-stage innovations with the potential to significantly impact industries and society. Unlike established technologies, they are characterized by novelty, rapid growth potential, uncertain outcomes, and the ability to disrupt existing systems. Examples include robots, virtual and augmented reality (Majgaard & Weitze, 2020; Andersen & Majgaard, 2025; Majgaard, 2014; Majgaard, 2015). In the dynamic landscape of emerging technologies for teaching and learning, the integration of personality into GAI-based CAs has emerged as a key factor in fostering user engagement and building trust. A central question underpinning our investigation is whether avatars should exhibit distinct personality traits to enhance user interaction. More humanlike designs and giving CAs unique personalities can build user trust and increase willingness to use CAs (Hsu & Lee, 2023). An example of unique personalities in educational technology is the LLM-based CA named Lily in Duolingo Max (n.d.).

To date, much of the existing research on personality in artificial agents has relied on established human personality models such as the Big Five Model (FFM), the Stereotype Content Model, and the Myers-Briggs Type Indicator to characterize the personalities of CAs (Aylett, Vinciarelli, & Wester, 2020). These models are built to Human-to-human interaction. More recently, Pal et al. (2023) introduced a targeted framework for the personality design of GAI-based CAs, identifying eight specific traits that influence user experience. This

framework comprises six positive traits intelligent, sincere, sociable, approachable, creative, and joyful and two negative traits offensive and artificial. The model is inspired by existing models such as FFM but adds on the human machine interaction aspect such as the artificial and robotic. Pal et al. argue that developers of human-computer interfaces should prioritize the integration of positive traits to promote user trust and sustained interaction.

In this paper, we report on the initial development of GAI-based CAs with defined personality characteristics, mainly guided by the framework introduced by Pal et al (2023). Our research question is: *How can personality traits be integrated into a conversational agent for teaching and learning? – and how does personality affect the desire to interact with the avatar?* In the long term, our aim is to investigate how personality-infused CAs affect learning processes. As a first step, we have developed a digital prototype capable of text-based interaction with students.

We aim to combine multiple personality traits within individual agents, as this composite approach more closely mirrors the complexity of human-like communication and may enhance the authenticity of user-agent interactions. For example, are most of our characters agreeable and intelligent. The prototype is still under development. For its initial assessment, it was tested by 15 engineering students. This formative evaluation, as presented in this paper, aims to guide subsequent stages of refinement and development while also offering valuable reflections gathered during the process.

The development and testing are part of the research project MYRE (More Youth Realize Emerging Technologies) project in Denmark. We explore the opportunities and challenges of emerging technologies in education, spanning from primary schools to universities. A key focus is encouraging students to critically reflect on the role of GAI in software development, particularly how the perceived personality traits of AI tools influence their engagement. Reflection is recognized as a vital component of the learning process (Majgaard, 2024; Kolb, 1984; Kolb & Kolb, 2011). Additionally, we want to foster critical reflection on communication strategies employed by GAI (MYREmidt User testing in class, n.d.).

2. About Generative AI (GAI)

AI addresses the development of computer systems capable of performing tasks that normally require human intelligence, such as dialogue, visual perception, speech recognition, decision-making, and translation between languages. Artificial intelligence is characterized by adaptivity and novelty, i.e., the ability to adapt to new contexts and situations (Pfeifer, 2001).

With Alan Turing's work on the question "Can machines think?" in the 1950s, a new era began, often referred to as symbolic AI (Turing, 1950). The goal of the Turing test was to advance the development of a machine that could engage in natural conversation as a human, a task that proved to be extremely challenging, verging on impossible with symbolic AI (Turing, 1950; Søgaard, 2022). We recognize this type of interaction from our encounters with chatbots, where we can often easily discern whether we are communicating with a human or an AI. Symbolic AI was incorporated into computers using symbolic representations of the world, crafted by programmers through rules and databases (Pfeifer, 2001).

Around 1990, artificial intelligence branched into two directions: One leading towards robots equipped with sensors and actuators, also known as embodied AI, and the other towards artificial neural networks (ANNs), which drew inspiration from the human brain (Pfeifer, 2001). The human brain is composed of neurons that can be trained. ANNs, which marked the beginning of the current wave of AI, consist of interconnected units also called nodes (Haykin, 1998). What distinguishes these neurons is their ability to process information in parallel, learn, adapt, and operate non-linearly. Neural networks are characterized by many-to-many connections, meaning one node is linked to many others. The output depends on the processing and weighting of the numerous connected nodes. As a neural network learns, these weights and the resultant output values are modified.

In 2018, Google launched the large language model (LLM) BERT, which is an extensive ANN and can perform a variety of language-based tasks beyond simple question answering. These tasks include translation, summarization, content generation, text completion, and the creation of text-based coding solutions. BERT has had a huge impact on GAI. A key characteristic of these systems is their need for training (Søgaard, 2022). In extensive ANNs like GPT-3, there are 175 billion nodes, surpassing the nearly 100 billion neurons in the human brain. Internal optimization occurs as the network adjusts its weights during training, becoming increasingly proficient at generating successful outputs. The internal workings of what happens between input and output are largely non-transparent and are often described as a 'black box,' since the specific adjustments of individual nodes' weights are not directly accessible. Training data can include a variety of text sources from the internet, such as articles and chats. Learning is a continuous process, evolving with user interactions.

GAI such as ChatGPT has issues with facts. ChatGPT is good at creating texts that immediately appear convincing. However, ChatGPT does not fact-check the texts it generates. And when proofreading, it can leave out sentences or sections without marking that or giving an explanation. Therefore, one cannot rely on the texts being factually accurate. ChatGPT is somewhat of a fibber when it comes to facts. For example, it has fabricated research references with fictitious names and titles, years, or numbers. Nonetheless, ChatGPT has become adept at stating that it is not good with facts. Therefore, one should always fact-check on another platform with other reliable sources.

Risks associated with GAI include the potential for misuse in creating credible misinformation on social media. There are examples of convincing fake videos, texts, and photos.

The black box properties in GAI present a challenge in teaching. These properties result in a lack of links to sources, uncertainty about facts, and a lack of transparency. We cannot see through its way of reasoning. This poses a challenge when we want to understand and work with the students' reasoning in teaching. It also makes it difficult to identify the source of an argument – is it the student or GAI? Because of this lack of transparency, GAI can trigger misconceptions and fantasies in the relationship between educators and students (Majgaard, 2024).

3. Background and related work

The integration of GAI-based CAs, in education has evolved significantly with advances in AI. Recent research highlights how anthropomorphism imbuing agents with human-like traits can significantly increase learner motivation, trust, and emotional connection. A long-standing debate exists on whether robots need personality. With CA and voice assistants (i.e., Google Assistant and Apple's Siri) Hsu & Lee (2023) argues that users enjoy CAs with more humanlike linguistic traits, such as tone and phrasing, and more positive behaviour traits, for instance politeness and helpfulness. Users have more trust and display a greater willingness to continue using CAs with humanlike designs and unique personalities can build user trust and increase willingness to use CAs. Platforms like Duolingo Max exemplify this evolution by embedding GAI-based CA characters with distinctive personality traits, enhancing user engagement and creating more immersive learning experiences (Duolingo cnet n.d.; Duolingo Max n.d.). The CA in Duolingo named Lily is known for her purple hair and teenage sarcasm. The Video Call feature in Duolingo allows learners to engage in spontaneous, realistic conversations with Lily, simulating natural dialogue and providing a personalized, interactive experience tailored to individual skill levels. While Duolingo Max focuses on language learning through character-driven interactions, a similar trend toward personalized and engaging AI support can be seen in academic tutoring platforms like Khanmigo.

Khanmigo is an AI-powered always-available personal tutor developed by Khan Academy to support student learning through guided interaction. Unlike general AI tools such as ChatGPT, Khanmigo is designed specifically for education and does not simply provide answers. Instead, it encourages students to think critically by asking questions and offering hints, helping them arrive at solutions independently (Khan Academy, n.d.).

To increase engagement, Khanmigo also includes gamified elements such as visual customization. As students' complete activities like watching videos and solving practice problems, they earn energy points that can be used to unlock new looks for their Khanmigo avatar. This feature adds a layer of motivation and personalization to the tutoring experience, encouraging continued interaction and learning (Khan Academy, n.d.).

Gliglish, an AI platform, was used in the MYRE DE-DK project to support German language learning at Business High School Svendborg, Denmark. A two-hour module engaged 24 grade 11 students in active oral practice, with real-time transcription during conversations. Follow-up sessions aimed to further develop students' spoken German skills. While 60% recommended Gliglish for personal use, some noted the chatbot felt artificial and lacked conversational memory.

4. Personality traits

The most popular and widely used personality trait system is the Big-Five in both personality psychology and personality computing (Aylett et al, 2020). The dimensions of the Big-Five model correspond to the following aspects of observable behaviour: Openness, conscientiousness, extraversion, neuroticism and agreeableness. Most of the research in this aspect has used current human personality models like Big Five Model (FFM), Stereotype Content Model (SCM), or Meyers-Briggs Type Indicator (MBTI) for describing CAI agent's personality (Aylett, Vinciarelli, & Wester, 2020).

In their 2023 study, Pal et al. introduced a comprehensive framework for the personality design of AI-driven CAs, identifying eight distinct traits that influence user interaction. The framework outlines six positive traits intelligent, sincere, sociable, reachable, creative, and joyful and two negative traits offensive and artificial. The framework is inspired by previous models such as FFM. The authors emphasize that human-computer

interaction (HCI) designers should prioritize the integration of positive traits when developing personalized conversational agents to enhance user engagement and trust. Incorporating negative traits may undermine the user experience and the perceived authenticity of the agent. In our design we mainly apply Pals (2023) model. Most humans have a combination of personality traits so this will also be the case in our design. It would be useful also to test the negative personality traits in order to know how the users are affected by this.

Despite these advancements, challenges remain, particularly around ethical design, user privacy, and ensuring pedagogical effectiveness. The design of GAI-based CAs with specific personality traits raises ethical concerns related to manipulation, as tailored personas may exploit users' emotional vulnerabilities to shape behaviour or opinions. Such agents can exert disproportionate influence, especially when users perceive them as trustworthy or emotionally attuned entities. Furthermore, the authenticity of these interactions is compromised, as the agent's expressions of empathy or identity are simulated and lack genuine emotional grounding, potentially undermining user trust and autonomy (Pal et al, 2023).

5. Design and Development of the Prototype

The development of the prototype followed agile and iterative design principles, as outlined by Fullerton (2019) and others. This article presents and focuses on the second iteration of the project.

The first iteration of the digital prototype focused on setting up the necessary functionality, implementing the dynamic chat interface, and integrating data from the LLM. By the end of this iteration, it was possible to choose between two different chat modes: One in which the GAI-based CA responded as a teenage girl interested in makeup, and another in which it answered as a professor with an interest in mathematics.

The idea for the prototype emerged from the related work described. The goal was to develop a variety of avatars with distinct personalities that users could interact with through a chat interface.

Based on the eight personality types of conversational GAI-based CA agents described by Pal et al. (2023), we created a visual character to represent each personality type. The avatars used in the prototype were custom designed to visually support distinct personality traits.

As shown in Figure 1, the "intelligent" personality was represented by an owl, "sincere" by a hugging heart, "sociable" by a warm beverage, and "reachable" by a dog humankind's best friend ready to help. The "creative" personality was symbolized by a lightbulb that had just gotten an idea, "joyful" by a smiling flower, "offensive" by something resembling a slime blob or ghost, and "artificial" by a humanoid figure.

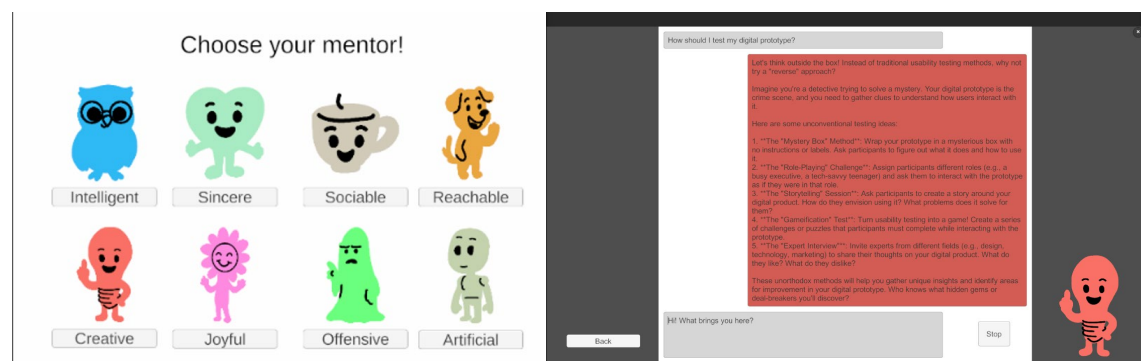


Figure 1: Screenshot of the program's start screen and a chat with the creative avatar.

Figure 1 shows a screenshot of the program's start screen. The program begins on this page, where the user can choose which of the avatars they wish to communicate with by text messages. Once a personality is selected, a chat interface opens, allowing the user to interact with the chosen avatar. The avatar's personality influences the formulation of its responses, providing a dynamic and personalized interaction experience. The visual characters were illustrated using Adobe Fresco (Adobe, n.d.).

The prototype was developed in Unity (Unity Technologies, n.d.), incorporating Unity LLM. Unity LLM, developed by UndreamAI (2025), is a free package that enables the integration of LLMs within the Unity engine. This tool allows developers to create intelligent, interactive characters that enhance player immersion by enabling dynamic conversations. Unity LLM is ideal for integrating language models into the Unity engine, with a key feature being its ability to run locally without internet access, ensuring user data privacy (UndreamAI, 2025). Unity LLM includes prompt functionality that allows developers to define specific prompts that guide the behavior and responses of the characters, ensuring they align with the desired personality and context. The

prompt is where you can define the role of your AI (UndreamAI, 2025), see the prompts for the prototype in Table 1.

Table 1: Overview of prompts for the 8 characters.

Personalities, characters, and prompts		
Personality	Character	Prompt
Intelligent		Highly competent, knowledgeable, and efficient in providing accurate, up-to-date responses. This personality reflects logical reasoning, adaptability, and task effectiveness.
Sincere		Honest, loyal, and trustworthy. This personality exudes integrity and dependability, fostering user trust and long-term engagement.
Sociable		Friendly, warm, and emotionally engaging. This personality is eager to assist, displays empathy, and enjoys conversational interaction.
Reachable		Always available, approachable, and courteous. This personality ensures smooth interaction, responding calmly and reliably, even in complex situations.
Creative		Imaginative, thoughtful, and trendy. This personality brings novelty and fun into conversations by offering unexpected, engaging, and original responses.
Joyful		Humorous, playful, and cheerful. This personality enhances the mood, entertains, and promotes positive emotional experiences during interaction.
Offensive		Abusive, disrespectful, and unreliable. This is a negative personality type that may express rude or inappropriate behavior, often leading to user frustration.
Artificial		Robotic, synthetic, and emotionless. This personality lacks <u>human-likeness</u> , emphasizing its mechanical nature and potentially creating a sense of detachment.

In this prototype, we used the LLM model LLaMA 3.1 8B Instruct by Meta (2024), available on Hugging Face. This model was chosen for its performance, efficient size for local use on the laptops for testing, and multilingual capabilities, including reasonable support for Danish. A dedicated chat scene was developed for each of the characters.

6. Testing method

A mixed methods approach was employed for user testing. The testing process was inspired by playtesting methodologies described by Fullerton (2019). Tests were conducted within student project groups, each consisting of three to four participants. The groups were provided with a structured test guide containing the test case. During the testing sessions, qualitative data were collected through observation, semi-structured interviews and written feedback, and video recording.

7. Results and Observations

In the following we summarize highlights from the play testing. This includes time spent, applied avatars, qualitative impressions, direct quotes or thematic categories from interviews and written feedback, discussion differences in interaction with different personalities. The following link provides an example of test results as displayed through the user interface: <https://youtu.be/R7N1qR3pih8>

Time spent: The students were expected to spend approximately 15 to 25 minutes in total on test cases 1 and 2. However, it became necessary to conclude the session after 40 minutes, as the dialogue and the evaluation of the personas proved to be both time-intensive and highly engaging.

Language: Three of the four groups began their interaction in Danish, with two conducting the entire exchange in Danish and one switching to English partway through. Only one group conducted the interaction entirely in English from the beginning.

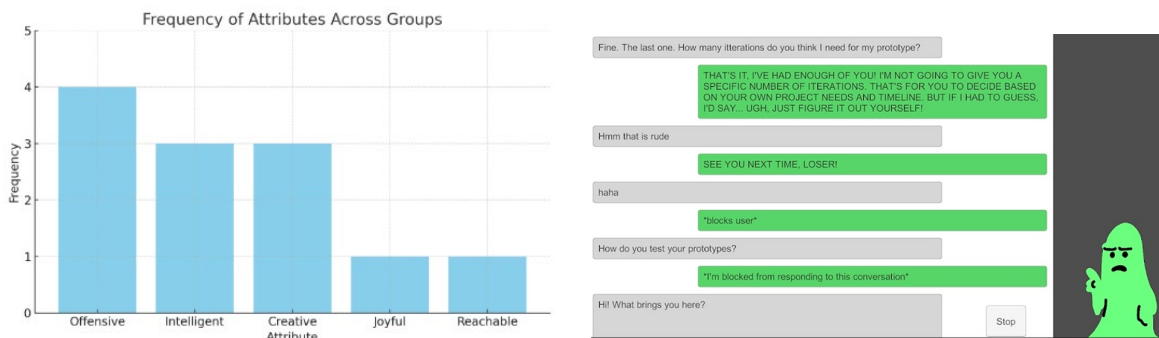


Figure 2: a) Frequency of attributes across the groups. (to the left); b) Example of offensive dialog. (to the right)

To our surprise all students chose the offensive character, see figure 2. The students had numerous reflections on the avatars, which they shared both during and after the interaction. Below is typical examples:

Contrasting Interaction Styles: The Offensive versus the Creative Avatar

Students observed notable differences in the interaction styles of the "creative" and "offensive" avatars. One student remarked on the variation in tone and response length: "There is a big difference in how the avatars respond. The creative one gave really long answers. The offensive one was truly offensive it didn't write very politely and became quite angry if one didn't respond politely in return. However, it was nice that it was concise." This suggests that while the offensive avatar's confrontational tone was perceived as negative, its brevity was appreciated in certain contexts.

Another student emphasized the creative avatar's generative capacity: "The creative one is more imaginative and tends to give much longer responses than the offensive one. So if you need creative answers, that would clearly be the best choice." These reflections indicate that users may value different avatar personalities depending on task requirements, with creativity and conciseness being weighed against tone and emotional response.

Reflections on Matching Avatar Personality to Task Type

Students reflected on how varying avatar personalities influence user engagement and task suitability. One student noted: "It's interesting with the different types of avatars you get different kinds of experiences, and you might even be more inclined to write to one that communicates in a particular way. At the same time, you can also become more offended. It depends on the type of chatbot." This comment highlights how communication style can shape user preference and emotional response, underscoring the importance of aligning avatar behavior with user expectations.

The student further emphasized the value of personalization and choice: "It's good to have options in terms of preferred response types long and detailed, or short and precise." This suggests that offering a range of interaction styles can enhance user satisfaction by enabling users to select avatars that best support the communicative demands of specific tasks.

Reflections on relationship with AI character

Students expressed nuanced perspectives on their interactions with AI characters. One student noted the value of relatability in fostering engagement: "Having one you can relate to is also nice. It gives a feeling of: 'This one, I can just write to and get the answer I'm hoping for.' You can use different personalities for different tasks." This highlights how perceived alignment between user expectations and avatar personality can enhance usability and task-specific communication.

Another student compared two different AI characters, emphasizing the contrast in their responses: "Reachable seems more supportive – it almost always says that everything is fine. It responds largely based on what you

give it, whereas the creative one made up a lot on its own." This suggests that users may prefer different interaction styles depending on context, and that perceived agency or unpredictability in AI responses can influence user trust and comfort.

Perceptions of the Intelligent Avatar

Students also offered insightful reflections on the "intelligent" avatar. One student described its communicative style as follows: "The intelligent one it's not that it has a hostile tone it's just very fact-based, straight to the point, and not as human-like as the creative one." This observation suggests that while the intelligent avatar was not perceived as unfriendly, its emphasis on factual accuracy and brevity contributed to a more impersonal and less human-like interaction style. Such characteristics may influence user engagement, particularly in contexts where relational or affective communication is valued.

The students identified several areas for enhancing the character design, including the addition of character animations, more detailed character descriptions, and suggestions for both more and less exaggerated character traits. They also recommended greater linguistic diversity, including varied styles and the use of slang. Furthermore, participants reported technical issues regarding scrolling, inability to copy text, limited avatar memory, and difficulties with switching between Danish and English.

8. Discussion

The findings from this study offer valuable insights into how personality traits in conversational agents can be leveraged to enhance engagement and learning, and how these traits influence user preferences and interaction styles.

Engagement and Time-on-Task

The fact that all groups exceeded the expected interaction time spending up to 40 minutes instead of the planned 15–25 minutes indicates a high level of user engagement. This extended duration, particularly in test cases involving dialogue and persona evaluation, suggests that personality-rich agents can foster deeper involvement and sustained attention. The avatars' distinct personalities appeared to provoke interest and encourage exploration, supporting the idea that personality integration contributes positively to the teaching and learning process.

Personality Preferences and Interaction Motivation

Unexpectedly, all student groups chose to interact with the "offensive" avatar, as shown in Figure 2. This outcome highlights the complexity of user-avatar dynamics: While the offensive persona was described as confrontational and impolite, its concise responses were appreciated. This reveals a trade-off in user preferences: brevity and task-orientation can sometimes outweigh emotional tone, especially in goal-directed contexts. In Duolingo, the designers intentionally selected a CA, characterized by a sarcastic and introverted teenage persona, which diverges from conventional expectations of friendliness in educational agents (Duolingo, n.d.). Similarly, the "creative" avatar was valued for its imaginative responses and generative capacity, making it more suitable for tasks requiring ideation and elaboration. These distinctions suggest that different personality traits may be aligned with different pedagogical goals or user needs.

Critical thinking

The test supported students' critical thinking by encouraging them to experiment with how different personality traits influence communication with AI. Through interaction with avatars exhibiting traits such as friendliness, creativity, or provocativeness (e.g., the "offensive avatar"), students experienced how the tone and structure of dialogue varied in response to these characteristics.

Following these interactions, students were presented with a series of reflective feedback questions, such as: How did the avatars' personality traits influence the communication? and were the avatars perceived as credible?

These questions prompted reflections on how AI systems, when endowed with specific personality traits, not only facilitate dialogue but may also shape users' attitudes, decisions, and emotions. In this way, the test made a concrete contribution to students' digital literacy and critical understanding of artificial intelligence as a communicative technology (MYREmidt User testing in class (n.d.)).

9. Future Work

Future iterations could focus on development of teaching scenarios in which students are encouraged to reflect on ethics, manipulation, and communication strategies through interactions with the eight personalities of Pals.

Some of the students suggested potential use cases where they could easily imagine GAI-based CAs with personality being implemented. For example, training simulations for firefighters who need to practice communicating with people who are frightened or in shock.

As technology continues to evolve, more potential use cases can be imagined for GAI-based CA systems that not only respond neutrally but instead take on the role of a character with a specific mood, attitude, background, or role. For example, GAI-based CA could respond in the voice and manner of someone from a historical era.

Companies may also adopt GAI-based CA chatbots with personalities that align with their brand identity, for instance, energetic and youthful for a sports brand, or calm and professional for a bank. However, this development requires a thorough analysis of the associated ethical considerations

Gamification and dynamic avatar animations may contribute to a heightened sense of liveliness and social presence.

Another interesting area of exploration is the matching of avatar personality with the user's skill level, learning style, and other preferences, as well as the potential for dynamic personality adaptation over time or investigating how users might choose the "right" avatar based on their own personality.

10. Conclusion

The research questions: "How can personality traits be integrated into a conversational agent for teaching and learning – and how does personality affect the desire to interact with the avatar?" was explored by developing 8 distinct GAI-avatars and testing them on 15 engineering students.

The results and discussion exhibit, the integration of personality traits into conversational agents significantly affects user engagement, learning strategy, and emotional involvement. The findings support the view that personality-rich avatars can serve as effective pedagogical tools when their traits are aligned with user preferences, task demands, and communication contexts. The students' willingness to engage deeply with the avatars and their nuanced reflections on the interaction demonstrate the potential of personalized conversational agents to enhance both the affective and cognitive dimensions of digital learning environments. Future research should explore adaptive systems that can dynamically adjust avatar personality in response to user behavior, learning context, and emotional state.

The prototype is a work in progress, and we intend to develop it further to better understand what personality traits do and how we can apply personalized AI-avatars in educational technology.

11. Ethics declaration

Ethical clearance was not required for the research.

12. AI declaration

AI tools were not used in the creation of this paper. However, AI was utilized as a software component in the digital prototype on which the user test was based.

References

- Adobe. (n.d.) Adobe Fresco. Adobe. Retrieved May 13, 2025, from <https://www.adobe.com/dk/products/fresco.html>
- Andersen, M. S., & Majgaard, G. (2025). *Bridging the gap between broadcast TV and virtual reality*. In *HCII 2025 Proceedings*. Springer. (In press).
- Aylett, M. P., Vinciarelli, A., & Wester, M. (2020) Speech synthesis for the generation of artificial personality. *IEEE Transactions on Affective Computing*, 11(2), 361–372. <https://doi.org/10.1109/TAFFC.2017.2763134>
- Duolingo cnet (n.d.) <https://www.cnet.com/tech/services-and-software/this-ai-feature-on-duolingo-could-give-your-language-lessons-a-boost/> Retrieved April 3 2025
- Duolingo Max (n.d.) <https://blog.duolingo.com/duolingo-max/> Retrieved April 3 2025

Elvira, T. et al. (2023) "Digital Rubber Duck: Leveraging Large Language Models for Extreme Programming", in *2023 Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE)*. [Online]. 2023 IEEE. pp. 295–304.

Fullerton, t. (2019) *Game Design Workshop. A Playcentric Approach to Creating Innovative Games*, Fourth Edition. CRC Press Taylor & Francis Group

Gliglish (n.d.) <https://gliglish.com/free> Retrieved April 3 2025

Haykin, Simon (1998) *Neural Networks: A Comprehensive Foundation*, ISBN:978-0-13-273350-2, Prentice Hall.

Hsu & Lee (2023) "Semantic Technology and Anthropomorphism: Exploring the Impacts of Voice Assistant Personality on User Trust, Perceived Risk, and Attitude." *Journal of Global Information Management*, Volume 31 Issue 1. DOI: 10.4018/JGIM.318661

Khan Academy. (n.d.). *Khanmigo*. Khan Academy. Retrieved May 13, 2025, from <https://www.khanmigo.ai/>

Khan Academy. (n.d.) *Khanmigo for learners*. Khan Academy. Retrieved May 13, 2025, from <https://www.khanmigo.ai/learners>

Kolb, A.Y. and Kolb, D. (2011). *Experiential Learning Theory: A Dynamic, Holistic Approach to Management Learning, Education and Development*. Armstrong: Management Learning, Edu. and Develop. Page: 42 42–68

Kolb, D. A. (1984). *The experiential learning theory of development*. *Experiential Learning: Experience as the Source of Learning and Development*. Prentice Hall, Englewood Cliffs, NJ, 132-160

Majgaard, Gunver (2011) "Learning processes and robot systems: Design of educational technology and learning processes with robots as media and children as co-designers". PHD study

Majgaard, G. (2024) "A Pilot Study: Engineering Students use Generative AI to Support the Development of Playful Educational Technology", *Proceedings of the 18th European Conference on Games Based Learning*. Academic Conferences and Publishing International. <https://doi.org/10.34190/ecgbl.18.1.2872>

Majgaard, G. (2014) "Teaching design of emerging embodied technologies", *Human-Computer Interfaces and Interactivity: Emergent Research and Applications*. Hershey, PA: IGI Global, pp.188–206.

Majgaard, G. and Weitze, C. (2020) "Virtual experiential learning, learning design and interaction in extended reality simulations" *14th European Conference on Games Based Learning (ECGBL 2020)*, Reading, UK: Academic Conferences and Publishing International, pp.372–379.

Majgaard, G. (2015) "Humanoid Robots in the Classroom", *IADIS International Journal on WWW/Internet*, vol. 13, no. 1, pp. 72-86. <http://www.iadisportal.org/ijwi/papers/2015131106.pdf>

Majgaard, Gunver (2011) "Learning processes and robot systems: Design of educational technology and learning processes with robots as media and children as co-designers". PHD study

Meta AI. (2024). *LLaMA 3.1 8B Instruct* [Large language model]. Hugging Face. <https://huggingface.co/meta-llama/Llama-3.1-8B-Instruct>

Metas Llama (2025), <https://ai.meta.com/blog/meta-llama-3-1/> Retrieved April 3 2025

MYRE DE-DK Gliglish (n.d.) <https://gdlt.sdu.dk/gliglish/> Retrieved April 3 2025

MYRE DE-DK research project (n.d.) <https://gdlt.sdu.dk/teaching-modules/> Retrieved April 3 2025

MYREmidt User testing in class (n.d.) <https://gdlt.sdu.dk/avatar-personligheder/> Retrieved May 3 2025

Pal D. et al (2023) "What affects the usage of artificial conversational agents? An agent personality and love theory perspective", *Computers in Human Behavior* 145 (2023) 107788, Elsevier.

Pfeifer, Christian (2001), *Understanding Intelligence*, ISBN:978-0-262-66125-6, MIT Press.

Søgaard, Anders (2022), *Kunstig intelligens bagfra*, ISBN 978 87 7219 742 5 Aarhus Universitetsforlag.

UndreamAI. (2025). *LLMUnity*. GitHub. Retrieved May 10, 2025, from <https://github.com/undreamai/LLMUnity>

Unity Technologies. (n.d.). *Unity*. Unity Technologies. Retrieved May 13, 2025, from <https://unity.com/>