The First Impression Counts!
The Importance of Onboarding for Educational Chatbots

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1 Introduction, problem, and motivation

Chatbots are computer programs that simulate natural, human-like conversation with humans via text interactions. Despite their great potential for educational scenarios, their presence in education is relatively small [WI18]. A limiting factor is that developing a chatbot requires a lot of expertise and effort. To address this, Wölfel presented the *PEdagogical conversational Tutor* (PET) chatbot system, which automatically trains a chatbot from PowerPoint slides [WO21]. The system can not only answer lecture-specific questions but also offer automatically generated tests and rate the replies.

According to [MC19] onboarding is very important for chatbots as most users are not aware of the features. However, onboarding for chatbots is not common. We noticed that many users perceive and use the PET more like a search engine than a conversational partner. According to [SO17], chatbot users can learn how to text with chatbots and adapt their language and behavior. Users mindlessly transfer human social rules and expectations to chatbots [NA00], but only if they assume they are talking to a system capable of conversation. To investigate how the onboarding process can influence the perception of the chatbot, we designed two onboarding processes for the PET system.

2 Study design and results

To investigate how onboarding new users into the PET system affects chatbot perception, we recruited 18 students and randomly divided them into two groups to perform an AB test. The "chatbot" group could only use the PET chatbot window to register and log in, while the "form" group was prompted to fill out a form. Both groups were able to text with the chatbot during the onboarding process, but the group chatbot had to text with the chatbot to continue, while texting was optional for the group form. After completing one

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of the onboarding processes, students used the PET system. Students then rated the system on a 5-point Likert scale (the higher the score, the better).

Group	Group Form	Group Chatbot	p
Interface	3.00 (1.25)	4.11 (1.11)	*0.045*
Conversation	2.67 (2.00)	4.11 (0.86)	*0.023*
Controls	3.33 (1.00)	4.67 (0.25)	*0.004*
Clarity	3.33 (1.50)	4.11 (0.61)	0.131
Conversation Quality	2.78 (0.69)	3.89 (0.61)	*0.010*
Search Function	4.00 (1.00)	4.11 (1.11)	0.821
Test Function	3.89 (0.36)	4.00 (0.25)	0.676
Visual Content	3.50 (0.86)	4.11 (0.61)	0.166

Tab. 1: Mean values of our questions; numbers in the brackets represent variances. Italic indicates *statistical significance (two-sided t-test, $p<0.05$).*

Table 1 shows that the group chatbot generally perceives the PET as more sophisticated and positive than the group form. During onboarding, most group form users did not interact with the chatbot. Our results indicate that the group chatbot finds controlling the system easier and the conversation quality better than users of group form. Moreover, we observed that the group chatbot formulated longer and more natural sentences. We assume that the users in the group chatbot are better primed to text naturally as they only could text during onboarding, since the chatbot was the only interactable element.

We found no statistically significant difference in the perception of the test and search function, the clarity, and visual content. This can be attributed to tests and searches being relatively unrelated to the conversation. Furthermore, visual content and clarity are more related to design than texting. Our study shows that the design of an onboarding process can influence the perception of educational chatbots and is leading to the use of the chatbot that is closer to a conversation rather than a search query.

Bibliography

[MC19] McAllister, Patrick; Kerr, James; McTear, Michael; Mulvenna, Maurice; Bond, Raymond; Kirby, Karen et al. (2019): Towards Chatbots to Support Bibliotherapy Preparation and Delivery.

[NA00] Nass, Clifford; Moon, Youngme (2000): Machines and mindlessness: Social responses to computers.

[SO17] Sörensen, Ingrid (2017): Expectations on chatbots among novice users during the onboarding process.

[WI18] Winkler, R., Söllner, M. (2018): Unleashing the Potential of Chatbots in Education: A State-Of-The-Art Analysis.

[WO21] Wölfel, Matthias (2021): Towards the Automatic Generation of Pedagogical Conversational Agents from Lecture Slides. In:. International Conference on Multimedia Technology and Enhanced Learning: Springer, Cham, S. 216–229.