Pedagogical Agents

A Summary of Workforce Research Evidence Relevant to the Child Welfare Field

What are pedagogical agents?

Pedagogical agents are "lifelike characters presented on a computer screen that guide users through multimedia learning environments" (Clarebout & Heidig, 2012, p. 2568). Pedagogical agents can vary in multiple ways. The following characteristics have been most studied: appearance (two-dimensional [2D] vs. three-dimensional [3D]), eye gaze, facial expression, gesturing, motion, and gender. The simplest pedagogical agent would be a static, 2D image with just text, and a complex agent would be a dynamic, 3D person or character that talks, gestures, and has eye movements and facial expressions.

Why are pedagogical agents valuable?

Pedagogical agents are valuable because they lead to improved learning outcomes, compared to when they are not included. The effects of many features have been studied, but only one of them has been found to matter—pedagogical agents that are depicted as 2D are more effective than those that are 3D (Castro-Alonso et al., 2021). Contrary to what might be expected, the following features do not have an effect on learning: gesturing, facial expressions (static, simple, or complex), motion (static vs. animated), and gender (Castro-Alonso et al., 2021). Though one might assume that it would be better for pedagogical agents to have human or human-like qualities and to provide social cues, those are not actually necessary for learning. These findings are consistent with other research that shows that unnecessary detail or information can interfere with learning (Mayer & Fiorella, 2014). This is good news for training developers, because simple pedagogical agents are easier to develop and implement than those with complex characteristics and functionality.

QIC-WD Takeaways

► Using a pedagogical agent in multimedia learning environments improves learning outcomes.

► The effect of pedagogical agents is stronger when they are 2D than when they are 3D.

► Pedagogical agents' gesturing, facial expressions, motion, and gender do not make a difference in learning outcomes.

► It is recommended that training include simple pedagogical agents.

References

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