

## **An Environment for Crowdsourced Electronic Educational Resources Based on Probing Questions (Reason Probing – Inclusion Probing) and its Effectiveness on Developing Achievement, Reflective Thinking Skills, and Social Presence in Light of Education Technology Students' Participations**

The aim of this paper is to identify the effectiveness of an environment for crowdsourced electronic educational resources based on two types of probing questions (reason probing – inclusion probing) on developing achievement, reflective thinking skills, and social presence in light of the participation of Education Technology students. The primary research sample consisted of 65 third-year Education Technology students at the Faculty of Specific Education in Fayoum University during the academic year 2022/2023. Those students were randomly selected and distributed into two groups. To achieve this aim, the researchers designed an electronic learning environment based on competitive internal crowdsourcing directed towards resources, using the two types of probing questions (reason probing – inclusion probing) in light of the educational and technical design standards for developing crowdsourced electronic educational environments, and a learning strategy employing probing questions in the crowdsourced environment. The researchers prepared measurement tools and verified their validity and reliability. The tools included a cognitive achievement test on the topics of computer-assisted learning strategies (the individualized instruction strategy, the practice and training strategy, the educational games strategy, and the simulation and role-play strategy), an evaluation card for each of the four strategies, a reflective thinking scale, and a social presence scale. The findings affirmed that the educational resource crowdsourcing environment based on the two types of probing questions (reason probing and inclusion probing) had a substantial impact on developing reflective thinking skills and social presence among the students in the sample. The students in the first experimental group, which studied using reason probing questions, were

more positive and effective than the second experimental group, which used inclusion probing questions regarding cognitive achievement, reflective thinking skills, and increased social presence. Moreover, student participation in questions and extended thinking time before answering resulted in more profound responses due to contemplation of all elements of the educational situation and higher-quality responses. In light of these findings, a set of recommendations and proposals were presented, including the expansion of studies related to crowdsourcing and its employment in learning processes, various types of probing questions, integration with modern technologies, and their relationship with developing many instructional design skills and improving learning outcomes.