

ABSTRACT

LILIS WINDA WINDAYANTI. 2026. ***THE EFFECT OF GEMINI AI-ASSISTED PROBLEM-BASED LEARNING ON STUDENTS' CRITICAL THINKING AND COLLABORATION SKILLS ON ECOSYSTEM MATERIAL (Experimental Study in Grade X of SMA Negeri 1 Cihaurbeuti, Academic Year 2025/2026)***. Department of Biology Education, Faculty of Teacher Training and Education, Siliwangi University.

Critical thinking and collaboration skills are skills that need to be developed in biology learning, especially in ecosystem material that is directly related to students' daily lives. This study aims to determine the effect of problem-based learning assisted by Gemini AI on students' critical thinking and collaboration skills. The research method used a quasi-experimental design with a non-equivalent pretest-posttest control group design. The study was conducted at SMA Negeri 1 Cihaurbeuti in the 2025/2026 academic year, with a population of all 10th graders consisting of twelve classes totaling 568 students. The sample was taken through a purposive sampling technique so that class X-E-12 was selected as the experimental class and class X-E-9 as the control class. The data collection technique used a test in the form of a critical thinking skills essay with 23 questions, then used a non-test in the form of a questionnaire with 43 statements to measure collaboration skills. The analysis prerequisite tests included a normality test and a homogeneity test showing that the data were normally distributed and homogeneous (Sig. >0.05). Furthermore, the Analysis of Covariate (ANCOVA) test showed a significance value of 0.001 for critical thinking skills and 0.003 for collaboration skills. These values are less than 0.05, meaning H_0 was rejected. Thus, the results of the study indicate that Gemini AI-assisted problem-based learning has an effect on students' critical thinking and collaboration skills in the ecosystems material.

Keywords: *Problem Based Learning, Gemini AI, Critical Thinking Skills, Collaboration Skills, Ecosystem*