

AI-Generated Storybooks and the Conceptual Understanding of Grade 7 Learners in Science: Basis for the Development of Supplementary Instructional Materials

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Abstract

This study determined the effectiveness of AI-generated storybooks in enhancing the conceptual understanding of Grade 7 Science learners at Tondo High School during School Year 2026–2027. Specifically, it compared the conceptual understanding of learners taught using the conventional teaching method and those taught using an AI-generated storybook-enhanced method. The study employed a quasi-experimental pretest–posttest control-group design involving 70 Grade 7 learners selected through purposive intact sampling. Researcher-made pretest and posttest instruments, validated by experts and subjected to reliability testing, were used to assess the learners' conceptual understanding of selected Grade 7 Science competencies aligned with the MATATAG Curriculum. The data were analyzed using the mean, standard deviation, paired-samples t-test, and independent-samples t-test. The findings showed that the control group obtained a pretest mean score of 10.03 and a posttest mean 2 Philippine Christian University Graduate School of Education score of 18.51, while the experimental group obtained a pretest mean score of 10.23 and a posttest mean score of 22.86. Significant improvements were observed in both the control group, $t(34) = 17.82$, $p < .001$, $d = 3.01$, and the experimental group, $t(34) = 26.79$, $p < .001$, $d = 4.53$. There was no significant difference between the groups' pretest performance, $t(68) = -0.358$, $p = .721$, $d = 0.08$, indicating comparable baseline performance. However, a significant difference was found between the posttest performance of the control and experimental groups, $t(68) = 7.078$, $p < .001$, $d = 1.46$, with the experimental group obtaining the higher mean score. The large effect size indicates a substantial difference in posttest performance favoring the AI-generated storybook-enhanced method. These findings suggest that AI-generated storybooks may serve as effective supplementary instructional materials for supporting the teaching and learning of abstract Science concepts. Based on the findings, an AI-generated storybook collection aligned with selected Grade 7 Science competencies under the MATATAG Curriculum was developed as a supplementary instructional resource.

Keywords: AI-generated Storybooks, Conceptual Understanding, Grade 7 Science, Quasi-Experimental Study

