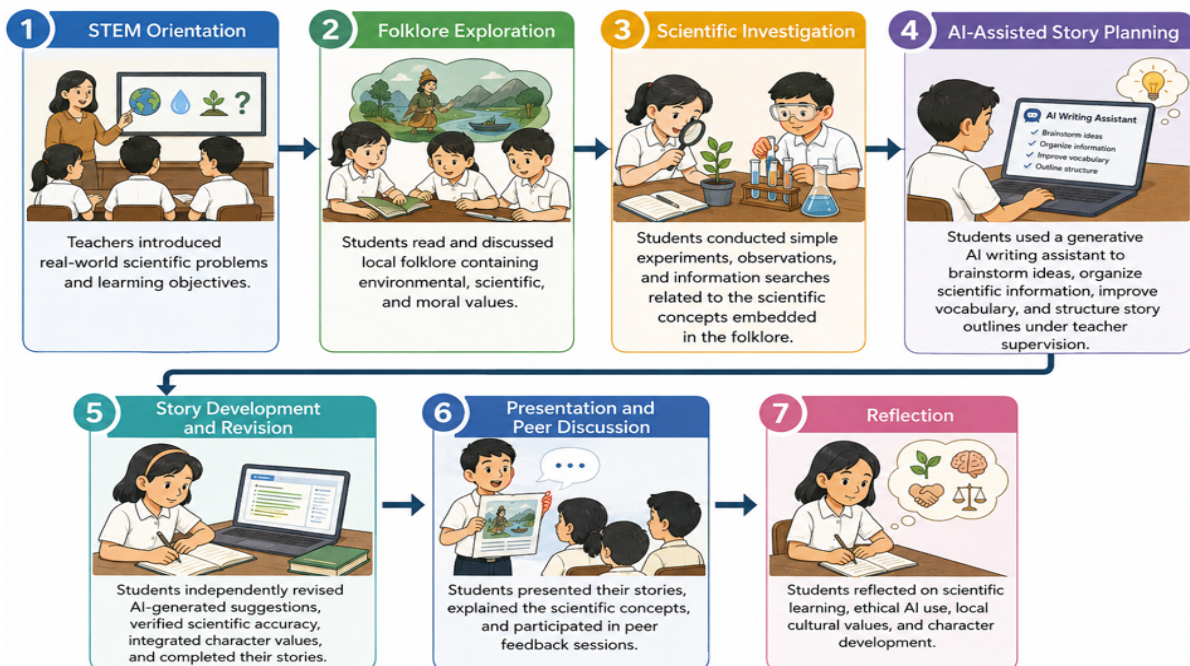
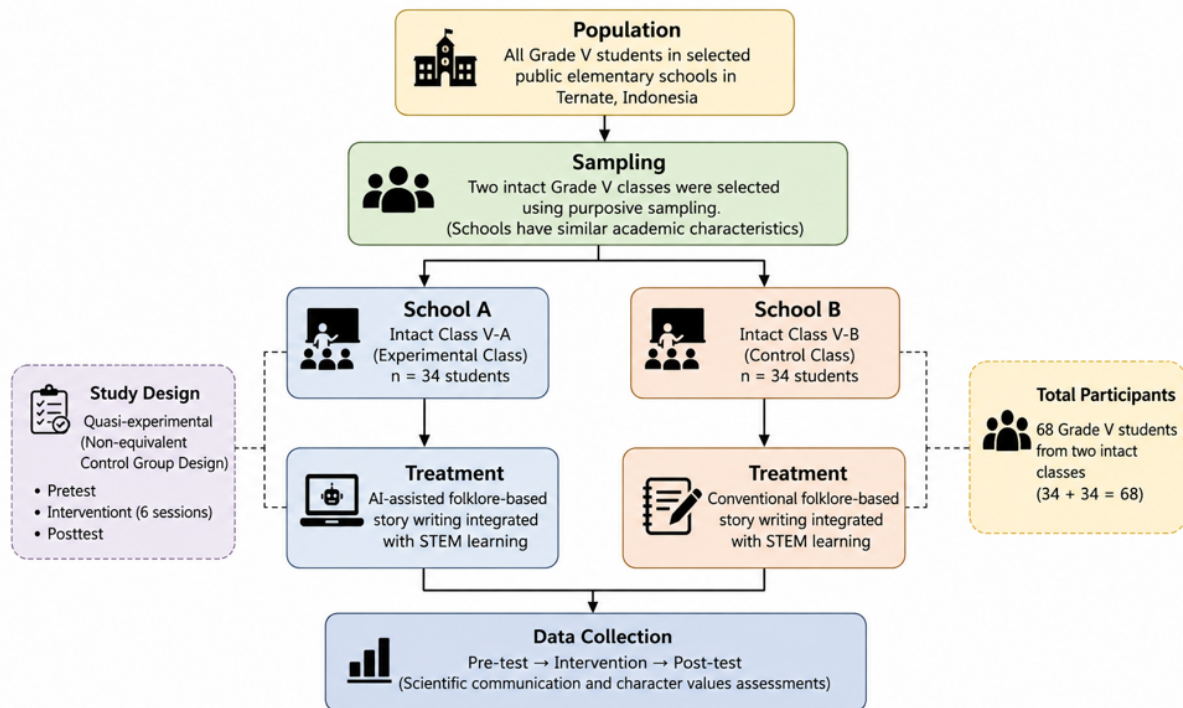


Figure 1. Participants and Grouping of the Study

68 Grade V students from two intact public elementary-school classes in Ternate, Indonesia





Component	1 STEM Orientation	2 Folklore Exploration	3 Scientific Investigation	4 AI-Assisted Story Planning	5 Story Development and Revision	6 Presentation and Peer Discussion	7 Reflection
Phase							
Purpose	Activate prior knowledge and introduce scientific problems and learning objectives.	Explore local folklore that contains environmental, scientific, and moral values.	Collect and analyze evidence to understand the scientific concepts embedded in the folklore.	Generate and organize story ideas with AI support based on scientific information.	Develop accurate, creative stories and integrate character values.	Share stories, explain scientific concepts, and receive constructive feedback.	Reflect on scientific learning, character development, and ethical AI use.
Teacher's Role	Introduce objectives, pose contextual problems, and connect to prior knowledge.	Guide reading and discussion; highlight scientific and moral values.	Facilitate investigations and ensure safety; provide resources and support data collection.	Guide effective AI use; model idea generation and story outlining.	Monitor revisions; provide feedback on scientific accuracy and character integration.	Facilitate presentations and peer feedback using discussion guidelines.	Lead reflection activities and connect learning to real-life actions.
Student Activities	Discuss problems, share ideas, and set learning goals.	Read and discuss folklore; identify scientific concepts and moral messages.	Conduct experiments, observations, and information searches; record findings.	Use AI to brainstorm ideas, expand vocabulary, organize information, and create outlines.	Revise AI suggestions; verify scientific accuracy; integrate character values; write final stories.	Present stories; explain scientific concepts; give and receive peer feedback.	Reflect in journals or discussions on learning, values, and AI ethics.
AI Integration	—	—	Use AI tools (e.g., search engines, data visualization) to support information gathering.	Use generative AI for idea generation, outline creation, vocabulary support, and structure recommendations.	Use AI for grammar checking, clarity improvement, and suggestions—students verify and decide.	Optional AI support (e.g., slide design, concept explanation) to enhance presentations.	Use AI for reflective prompts or summarization to support metacognition.
Key Outputs	Problem statements and learning goals.	Folklore notes and identified values.	Investigation data and concept summaries.	Story outline and AI-generated idea map.	Final story draft with scientific accuracy and character values.	Presented stories and peer feedback summary.	Reflection notes and action plans.
Integrated Focus	Scientific Inquiry Literacy Character Awareness	Literacy Cultural Values Character Education	Scientific Inquiry Data Literacy Environmental Awareness	AI Literacy Information Literacy Ethical Use of AI	Literacy Scientific Accuracy Character Education Creativity	Communication Collaboration Character Education	Metacognition Character Education Ethical AI Use Environmental Stewardship

Underlying Principles

Scientific Inquiry
 Literacy Practices
 Ethical AI Use
 Character Education
 Collaboration

