

DECLARATIONS

Funding statement

This research received no specific grant or financial support from any public, commercial, institutional, or not-for-profit organization.

Ethical statement

The study protocol involving human participants and human data was reviewed and approved by the Ethics Committee of the Faculty of Teacher Training and Education, Universitas Riau, under approval number 1133/UN19.5.1.1.5/AK/2025, dated 20 May 2025. The authors confirm that all procedures involving human participants and human data were conducted in accordance with the approved protocol, applicable institutional guidelines and regulations, and the ethical principles of the Declaration of Helsinki. Before data collection, the committee reviewed and approved the study design, participant recruitment procedures, informed consent process, management of potentially identifiable information, confidentiality safeguards, and arrangements for secure data handling.

Informed consent procedure

The expert-consultation component involved 15 adult participants who contributed to five focus group discussion sessions conducted from 1 July 2025 to 30 October 2025. Participants were recruited purposively because their academic expertise or professional experience was directly relevant to elementary pedagogy, elementary curriculum, educational media and technology, disaster-mitigation content, or elementary-school practice. Participation was initiated only after the approved recruitment and consent procedures had been completed.

Before enrolment, each prospective participant received a written participant information sheet in clear, accessible language. The document explained the purpose and scope of the study; the nature and expected duration of the focus group discussions; the topics to be considered; how participants' contributions would be documented, analyzed, and reported; any reasonably foreseeable inconvenience or risk; the absence of direct financial benefit; the voluntary character of participation; and the measures adopted to protect privacy and confidentiality. Prospective participants were given sufficient time to read the information, consider participation without pressure, ask questions, and obtain clarification from the research team.

Written informed consent was obtained from each participant before the first focus group session in which they participated. Consent covered participation in the discussions, documentation, and analysis of the contributions, and publication of aggregated or de-identified findings in scholarly outputs. Participants were informed that they could decline to answer any question, pause their participation, or withdraw without penalty, loss of professional standing, or other adverse consequence. Withdrawal remained possible until the participant's contribution had been de-identified and incorporated into the aggregated analytic record, after which individual data could no longer be reliably isolated.

Confidentiality was maintained during recruitment, consultation, analysis, and reporting. Direct identifiers were excluded from analytic materials and from the manuscript, and participants were described only by broad fields of expertise or professional practice. Access to consultation records was restricted to authorized members of the research team through password-protected storage and role-based access controls. The records were used only for purposes approved by the ethics committee, retained in

accordance with applicable institutional requirements, and securely disposed of after the prescribed retention period. Only aggregated or de-identified information is reported, and no quotation or contextual detail is included that would reasonably permit identification of an individual participant.

Data availability statement

Aggregated data supporting the findings may be made available by the corresponding author upon reasonable request, subject to ethical restrictions and protection of participant confidentiality.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of the revised manuscript, the authors used OpenAI ChatGPT to support language refinement, editorial organization, and consistency checking. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

CRedit authorship contribution statement

Eddy Noviana: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review and editing, Visualization, Supervision, Project administration. Hadriana: Methodology, Supervision, Writing – review and editing. Yustina: Conceptualization, Formal analysis, Supervision, Writing – review and editing. Sri Erlinda: Investigation, Formal analysis, Writing – review and editing. Otang Kurniaman: Methodology, Investigation, Writing – review and editing. Ningrum Melihayatri: Investigation, Visualization, Writing – review and editing. Zakiah Ulya: Investigation, Formal analysis, Writing – review and editing. Beny Al Fajar: Visualization, Project administration, Writing – review and editing. Hasnah Faizah: Formal analysis, Supervision, Writing – review and editing. Hambali: Investigation, Project administration, Writing – review and editing. All authors reviewed and approved the final manuscript.