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Wizer.me-Based Social Studies Worksheets with Think Pair Share Model to Improve Critical Thinking Skills

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ABSTRACT

This study developed a Wizer.me based Social Studies worksheet integrated with the Think Pair Share model for Grade VI students and examined its feasibility, practicality, and effectiveness in supporting critical thinking skills. Research and development was conducted using the ADDIE model. Content and media experts evaluated product feasibility, while practicality was assessed through one to one, small group, and field trials. Effectiveness was examined using a quasi experimental pretest and posttest control group design involving two classes of 20 students. The worksheet addressed "Stories about Our Indonesia" through videos, images, interactive questions, and structured think, pair, and share activities. Content validation reached 72.92%, media validation 82.81%, and the descriptive mean 77.67%. Student practicality reached 85.26%, while teacher practicality reached 100%. The experimental group achieved an N gain of 0.724, compared with 0.599 in the control group, with significant differences in posttest, gain, and N gain. These findings indicate that the integrated intervention was feasible, practical, and associated with stronger critical thinking improvement than the control condition, supporting structured digital learning in elementary Social Studies classrooms.

Penelitian ini mengembangkan Lembar Kerja Peserta Didik IPS berbasis Wizer.me yang terintegrasi dengan model Think Pair Share untuk peserta didik kelas VI serta menguji kelayakan, kepraktisan, dan keefektifannya dalam mendukung keterampilan berpikir kritis. Penelitian dan pengembangan dilaksanakan menggunakan model ADDIE. Kelayakan produk dinilai oleh ahli materi dan ahli media, sedangkan kepraktisan diuji melalui tahap one to one, small group, dan field trial. Keefektifan diuji menggunakan desain kuasi eksperimen pretest dan posttest dengan kelompok kontrol yang melibatkan dua kelas, masing masing terdiri atas 20 peserta didik. LKPD memuat materi "Cerita tentang Indonesia Kita" melalui video, gambar, soal interaktif, serta aktivitas think, pair, dan share yang terstruktur. Validasi materi mencapai 72,92%, validasi media 82,81%, dan rerata deskriptif 77,67%. Kepraktisan peserta didik mencapai 85,26%, sedangkan kepraktisan guru mencapai 100%. Kelompok eksperimen memperoleh N gain 0,724, dibandingkan 0,599 pada kelompok kontrol, dengan perbedaan signifikan pada posttest, gain, dan N gain. Temuan ini menunjukkan bahwa intervensi terintegrasi tersebut layak, praktis, dan berkaitan dengan peningkatan keterampilan berpikir kritis yang lebih kuat dibandingkan kondisi kontrol dalam pembelajaran IPS kelas VI sekolah dasar.

Keywords: critical thinking skills, social studies, think pair share, wizer.me

Introduction

Social Studies education at the elementary level is expected to develop more than students' knowledge of historical events, geographical conditions, economic activities, and social life. It should also enable students to interpret social information, examine relationships among events, consider different perspectives, and make reasoned judgments about issues encountered in everyday life. This orientation reflects the longstanding position of Social Studies as a field that prepares students to understand society and participate responsibly in it (Banks, 1990; Barr et al., 1977; National Council for the Social Studies, 2010; Sapriya, 2009; Soemantri, 2001; Zevin, 2023). Within contemporary learning environments, this purpose has

become increasingly important because students encounter information from diverse digital sources and therefore need the capacity to distinguish relevant evidence from unsupported claims. Consequently, elementary Social Studies learning needs to move beyond the transmission and memorization of factual knowledge toward learning experiences that actively engage students in reasoning about social and historical information.

Critical thinking provides an essential cognitive foundation for such learning because it involves the systematic interpretation of information, analysis of relationships, evaluation of reasoning, and formulation of evidence-based conclusions (Dwyer et al., 2014). In Social Studies, these abilities enable students to examine causes and consequences, distinguish facts from opinions, compare perspectives, justify their responses, and draw conclusions from available information. Critical thinking is therefore closely associated with the development of responsible citizenship and reasoned decision-making (ten Dam & Volman, 2004). At the elementary level, these abilities should be developed progressively through social contexts appropriate to students' experiences (Odebiyi & Odebiyi, 2021). Nevertheless, evidence indicates that elementary students do not necessarily develop critical thinking spontaneously and require learning activities deliberately structured to stimulate analytical reasoning (Kawuryan et al., 2021). This condition highlights the need for instructional resources that transform critical thinking from an expected learning outcome into an observable process embedded within students' learning activities.

The preliminary needs analysis conducted in five public elementary schools in Palembang reinforced this instructional need. Teachers indicated that students demonstrated varying levels of engagement in Social Studies and that some experienced difficulty when dealing with conceptually dense or abstract content. Students tended to respond more positively to visual materials, videos, quizzes, and collaborative activities, while tasks requiring extended explanations or independent reasoning remained challenging for some learners. An examination of the worksheets used in the schools also indicated that learning activities were still largely dominated by multiple-choice questions, short responses, and routine exercises. Although some materials included reading, visual resources, or group work, the activities did not consistently guide students through processes of developing an initial position, comparing evidence and reasoning, and communicating conclusions. These findings suggest that the instructional challenge concerns not only students' engagement but also the way learning materials structure opportunities for critical thinking.

Student worksheets can address this problem when they are designed as learning environments rather than merely collections of exercises. Well-structured worksheets can direct students to observe information, formulate questions, identify relationships, provide justification, evaluate responses, and construct conclusions. Previous development research has demonstrated that worksheets integrated with active learning approaches can achieve acceptable levels of validity, practicality, and effectiveness while supporting critical-thinking development (Pitriyana & Arafatun, 2022). A broader analysis similarly indicates that worksheets can have substantial effects on critical and creative thinking when their activities intentionally engage higher-order cognitive processes (Widodo et al., 2025). Digital environments extend these possibilities by combining textual, visual, audiovisual, and interactive resources within the same learning space. Wizer.me, for example, enables the integration of text, images, videos, open-ended responses, matching activities, tables, reflections, and other interactive tasks. Previous research has reported positive feasibility and student responses to Wizer.me-based worksheets (Dewi et al., 2023), while its interactive

functions have also been associated with the integration of technological, pedagogical, and content knowledge in learning activities (Kaliappen et al., 2021).

Digital functionality alone, however, does not guarantee cognitively meaningful learning. When technological features are used without a deliberate pedagogical sequence, a digital worksheet may reproduce the same task structure as a conventional printed worksheet in a different medium. Research on classroom technology emphasizes that educational benefits are more likely to emerge when technology supports student-centered activity, interaction, collaboration, and meaningful feedback (Swai, 2025). For this reason, the present study positions Wizer.me as the digital environment through which a structured learning process is implemented rather than as an independent technological intervention. The Think Pair Share (TPS) model provides this pedagogical structure by organizing learning into three connected stages: students initially construct an individual response, examine and refine their reasoning with a partner, and subsequently communicate the resulting ideas to others (Lyman, 1981; Slavin, 1995; Kagan & Kagan, 2009; Arends, 2012; Cooper, 2018). Such progression is consistent with constructivist perspectives in which understanding develops through both individual cognitive activity and social interaction (Piaget, 1950; Vygotsky, 1978).

The integration of Wizer.me and TPS becomes particularly relevant to critical thinking when digital features are deliberately assigned functions within the think, pair, and share sequence. During the think stage, texts, historical images, maps, and videos can provide evidence that students independently interpret and analyze before formulating an initial response. During the pair stage, students compare their interpretations, examine differences in evidence and reasoning, and reconsider their initial conclusions. During the share stage, students communicate and justify the conclusions developed through discussion. This sequence corresponds closely with critical-thinking dimensions involving interpretation, analysis, evaluation, inference, and explanation (Facione, 2020), as well as the emphasis on clarity, credibility, reasoning, and decision-making described by Ennis (2011, 2018). Empirical studies have also demonstrated the potential of media-supported TPS for critical-thinking development (Oktafiani et al., 2024) and the contribution of cooperative learning and metacognitive processes to critical thinking in Social Studies (Suprijono & Abbas, 2025). Accordingly, the expected contribution does not arise from digital media or cooperative learning in isolation, but from the purposeful alignment of digital resources, collaborative reasoning, and critical-thinking tasks.

This alignment is particularly appropriate for the Grade VI Social Studies topic “Stories about Our Indonesia,” which includes the arrival of foreign nations, resistance to colonialism, events surrounding independence, and the values associated with national struggle. Historical learning provides opportunities for students to move beyond recalling names, dates, and chronological sequences by examining motives, causal relationships, consequences, decisions, and the significance of past events. Such analytical engagement is important because meaningful history learning requires students to reason about evidence and interpretations rather than merely reproduce factual information (Hartzler-Miller, 2001). Previous studies have separately demonstrated the potential of Wizer.me-based digital worksheets (Dewi et al., 2023), worksheets designed to foster critical thinking (Pitriyana & Arafatun, 2022), and digital learning media intended to strengthen critical thinking (Prasasti & Anas, 2023). Nevertheless, these strands of research leave room for an instructional design that explicitly connects the interactive functions of a digital worksheet with the cognitive-social sequence of TPS and

evaluates the resulting product through successive stages of development and classroom implementation.

Against this background, the contribution of the present study lies not simply in combining Wizer.me with an established cooperative-learning model, but in designing a Social Studies worksheet in which digital components are deliberately mapped onto the think, pair, and share processes and critical-thinking activities. The study consequently treats Wizer.me and TPS as an integrated instructional intervention rather than attempting to attribute learning outcomes independently to either component. Using the ADDIE development framework, the study aims to develop a Wizer.me-based Social Studies worksheet integrated with TPS for Grade VI students, determine its feasibility through expert validation, examine its practicality through teacher and student use, and evaluate its effectiveness in supporting critical-thinking development. In this way, the study seeks to contribute both a usable digital learning resource for elementary Social Studies and empirical evidence concerning how digital worksheet design can be pedagogically structured to support interpretation, analysis, evaluation, inference, and explanation in classroom learning.

Methods

This study employed a Research and Development (R&D) approach using the ADDIE model, which comprises five interconnected stages: analysis, design, development, implementation, and evaluation (Branch, 2009; Molenda, 2015). The model was selected because it provides a systematic framework for translating identified learning needs into instructional objectives, learning activities, digital resources, assessment procedures, and progressive product improvement. Evaluation was embedded throughout the development process rather than being conducted only at the final stage, allowing information obtained from needs analysis, expert validation, user trials, and classroom implementation to inform subsequent revisions. During the analysis stage, the study examined teacher and student needs, characteristics of Grade VI Social Studies learning, curriculum requirements, learning materials, available facilities, and worksheets previously used in five public elementary schools in Ilir Barat I District, Palembang. Semi-structured interviews with Grade VI teachers, classroom observations, and worksheet document analysis were used to identify recurring instructional problems and students' learning characteristics. Particular attention was given to the types of activities and questions available in existing worksheets, the use of visual and digital resources, opportunities for individual and collaborative learning, and the extent to which existing materials encouraged students to interpret information, analyze relationships, evaluate ideas, provide reasons, and formulate conclusions. The convergence of these findings provided the basis for selecting the topic "Stories about Our Indonesia," Wizer.me as the digital platform, and Think Pair Share (TPS) as the pedagogical structure of the developed worksheet.

The design stage translated the identified needs into the instructional structure of the product. The worksheet was designed to contain student identity and user instructions, learning outcomes and objectives, Social Studies content, historical images and maps, videos, interactive questions, TPS activities, evaluation, and reflection. Wizer.me was not positioned merely as a digital substitute for a printed worksheet; instead, its features were organized according to the cognitive and social sequence of TPS. During the **think** stage, students independently examined learning sources and formulated initial responses; during the **pair** stage, they compared evidence and reasoning with a partner and refined their responses; and during the **share** stage, they communicated and justified the conclusions developed through discussion. These

activities were aligned with the critical-thinking dimensions of interpretation, analysis, evaluation, inference, and explanation. At this stage, expert-validation instruments, teacher and student practicality questionnaires, observation sheets, interview guidelines, and a critical-thinking test were also prepared. The critical-thinking assessment consisted of five essay questions representing the five targeted dimensions, thereby allowing students to demonstrate reasoning through constructed responses rather than predetermined answer choices. The available research documentation, however, does not report separate reliability coefficients or inter-rater reliability statistics for these instruments; therefore, such values are not introduced in the present description.

During development, the instructional design was transformed into an operational Wizer.me worksheet incorporating textual information, historical illustrations, videos, open-ended questions, matching activities, response fields, evaluation tasks, and reflection. The initial product was evaluated by one content expert and one media expert. Content validation focused on the alignment of learning objectives and materials, content suitability, accuracy, and currency, whereas media validation examined didactic, construction, and technical aspects, including clarity of instructions, readability, visual organization, multimedia functionality, and ease of use. The scores obtained were compared with the maximum possible scores and converted into percentages, while qualitative comments from both experts were used as the principal basis for product refinement. Revisions included strengthening the visibility of the think, pair, and share sequence, clarifying instructions, improving visual presentation, reorganizing response areas, and addressing video playback issues. After expert-based revision, practicality testing was conducted progressively through purposive sampling: a one-to-one trial involving six students and one teacher at SD Negeri 237 Palembang, a small-group trial involving 14 students and one teacher at SD Negeri 40 Palembang, and a field trial involving 20 students and one teacher at SD Negeri 25 Palembang. Students and teachers evaluated aspects such as learning objectives, content, presentation, language, graphics, accessibility, attractiveness, and usefulness. Quantitative questionnaire responses were complemented by open-ended comments so that practical difficulties identified during use could inform minor revisions before classroom implementation. The complete sequence of product trials, participants, locations, and purposes is presented in Table 1.

Table 1. Product Trial Stages, Locations, Participants, and Main Objectives

Stage	Location	Participants	Main Objective
One-to-one trial	SDN 237 Palembang	6 students and 1 teacher	To assess initial practicality and clarity of use
Small group trial	SDN 040 Palembang	14 students and 1 teacher	To assess practicality in a small group
Field trial	SDN 025 Palembang	20 students and 1 teacher	To assess practicality on a broader scale
Implementation	SDN 24 and SDN 238 Palembang	20 control and 20 experimental students	To test effectiveness through a pretest–posttest design

The effectiveness of the completed product was examined during the implementation stage using a quasi-experimental pretest–posttest control-group design. The control group consisted of 20 Grade VI students from SD Negeri 24 Palembang who learned using printed worksheets and discovery learning, while the experimental group consisted of 20 Grade VI students from SD Negeri 238 Palembang who learned using the Wizer.me-based worksheet

integrated with TPS. Both groups completed a pretest and posttest consisting of five essay questions addressing interpretation, analysis, evaluation, inference, and explanation. This design is important for interpreting the findings because the groups differed in both instructional medium and learning model. Accordingly, the intervention was treated as an integrated Wizer.me–TPS condition, and the effectiveness analysis was intended to determine its performance relative to the specific printed worksheet–discovery learning condition used in the control group. The design does not permit the independent effects of Wizer.me and TPS to be separated. Qualitative data were obtained from interviews, observations, documentation, and comments from experts, teachers, and students, whereas quantitative data comprised validation scores, practicality responses, pretest scores, posttest scores, and measures of learning improvement. Feasibility was determined by comparing obtained validation scores with the corresponding maximum possible scores, practicality was calculated from the proportion of positive responses, and improvement in critical-thinking performance was examined using raw gain and normalized gain (N-gain) following Meltzer (2002).

Prior to inferential testing, the quantitative data were examined using the Shapiro–Wilk normality test and Levene's homogeneity test. The experimental group's pretest yielded a Shapiro–Wilk significance value of 0.046, indicating that this dataset did not satisfy the conventional normality criterion at $\alpha = 0.05$; therefore, the manuscript does not treat all pretest distributions as normally distributed. In contrast, the reported posttest and gain data met the normality requirement, while the pretest, posttest, and gain variances were homogeneous. Changes within groups were examined by comparing pretest and posttest performance, whereas differences between groups were evaluated using posttest, gain, and N-gain outcomes at a significance level of 0.05. The interpretation of effectiveness considered descriptive statistics, statistical significance, and N-gain patterns together rather than relying on a single indicator. Most importantly, any observed advantage of the experimental group was interpreted as evidence concerning the combined Wizer.me–TPS intervention relative to the control condition, rather than as evidence that Wizer.me independently produced the observed improvement in students' critical-thinking skills.

Result

1. Needs Analysis and Development Basis

The needs analysis across the five participating elementary schools revealed considerable variation in students' engagement with Social Studies and in their ability to work with conceptually demanding learning materials. While some students perceived Social Studies as interesting, useful, and relatively easy to understand, teachers consistently identified a group of students who participated less actively, lost interest when lessons became heavily theoretical, and experienced difficulty interpreting concepts that were not directly connected to their everyday experiences. Similar patterns emerged from student responses, particularly when learning tasks required them to understand extended explanations or respond to questions involving abstract ideas. Teachers also observed that although students were generally capable of providing reasonable answers, they were not consistently accustomed to explaining the basis of their responses, comparing alternative viewpoints, or defending an opinion with supporting reasons. This difficulty became more apparent during classroom communication, as some students showed hesitation, nervousness, or limited confidence when presenting their ideas before their peers. Taken together, these findings indicated that the

central instructional need was not simply to increase students' interest in Social Studies, but to create learning experiences that progressively support the transition from understanding information to articulating, examining, and communicating reasoned judgments.

Analysis of the instructional materials further demonstrated that the structure of the existing worksheets provided limited opportunities for such reasoning processes. Worksheets were already familiar learning resources in the participating schools, but the materials examined were predominantly organized around written exercises, illustrations, mind maps, crossword puzzles, multiple-choice questions, and short-answer tasks. The analysis of three worksheet documents showed that activities emphasizing recognition and recall occurred more frequently than tasks requiring students to explain causal relationships, justify answers, evaluate statements, compare evidence, or formulate conclusions. Some group-based worksheets incorporated reading activities, video viewing, map construction, and classroom presentations, indicating that elements of collaborative learning had already been introduced. Nevertheless, collaboration was not systematically structured to ensure that students first developed an individual response, subsequently examined their reasoning with a peer, and finally communicated a refined conclusion. At the same time, both teachers and students demonstrated readiness for greater use of digital resources. Students responded positively to pictures, projected materials, quizzes, and peer-based activities, while teachers viewed digital worksheets as potentially useful for increasing engagement and supporting assessment. However, because most teachers had no prior experience with Wizer.me, any digital product introduced into this context needed to combine interactive functionality with clear instructions, accessible navigation, and a learning sequence that could be implemented without creating unnecessary technological demands for first-time users.

The convergence of evidence from interviews, observations, student responses, and document analysis established three interrelated requirements for product development. First, Social Studies materials needed to present conceptually dense and historical information through more accessible visual and interactive representations while retaining a clear instructional sequence. Second, worksheet activities needed to move beyond the dominant emphasis on factual recall by creating explicit opportunities for students to interpret information, analyze relationships, provide reasons, evaluate responses, and construct conclusions. Third, the learning process needed to accommodate both individual reasoning and social interaction because students required opportunities to develop an initial idea before testing and communicating it with others. These findings became the instructional basis for developing a Wizer.me-based worksheet integrated with Think Pair Share (TPS). Wizer.me was selected to accommodate multimedia and interactive learning activities, while the TPS sequence was incorporated to organize students' reasoning from independent thinking to paired examination and subsequent sharing. Thus, the resulting product was designed in response to the combined pedagogical, cognitive, and technological needs identified across the participating schools rather than simply introducing a digital alternative to the existing printed worksheets.

2. Product Design and Characteristics

The developed product was a Wizer.me-based Social Studies worksheet for the Grade VI topic *"Stories about Our Indonesia,"* with learning content organized around the arrival of foreign nations, resistance to colonial rule, events surrounding the proclamation of independence, and the values reflected in the national struggle. The worksheet was structured as a connected learning sequence rather than a collection of independent digital exercises. It began with an

introductory display, student identity, and user instructions, followed by learning outcomes and objectives that informed students about the direction of the activities. The main content was then arranged chronologically so that students could follow the relationship between historical developments rather than encounter them as isolated facts. Historical figures, maps, illustrations of important events, and learning videos were incorporated to provide visual support for events that students could not directly observe. After engaging with these sources, students encountered questions that required more than factual recall, including tasks asking them to explain reasons, identify cause-and-effect relationships, interpret information, and make judgments based on the material provided. Evaluation and reflection were placed toward the end of the worksheet to connect students' understanding of historical content with the broader meaning and values derived from the events they had studied.

A defining characteristic of the product was the direct incorporation of the Think Pair Share (TPS) sequence into the worksheet activities. In the think stage, students first worked independently with the information presented through texts, images, and videos and constructed an initial response before interacting with a partner. For instance, when examining the arrival of foreign nations in Indonesia, students were asked to use information from the available sources to explain the reasons underlying their arrival rather than simply identify the countries involved. The pair stage then provided an opportunity for students to compare their initial responses, examine similarities and differences in their reasoning, and reconsider an answer when their partner presented a different interpretation. In the share stage, the results of this paired reasoning were communicated either through classroom presentation or through the response space provided in the worksheet. In this way, TPS functioned as part of the worksheet architecture rather than as an additional classroom instruction delivered separately by the teacher. The sequence also created a progression from individual interpretation to collaborative evaluation and finally to explanation, thereby linking the learning process with the critical-thinking dimensions targeted by the study.

The interactive functions available in Wizer.me were selected according to the purpose of each learning activity. Open-ended questions were used when students needed to construct explanations or arguments, while matching activities helped them establish connections among historical figures, events, and forms of resistance. Fill-in-the-blank tasks supported the organization of essential information, videos provided contextual and chronological representations of historical events, and reflection prompts encouraged students to relate the values identified in historical struggles to situations in everyday life. The combination of these features allowed digital interaction and peer interaction to operate within the same instructional sequence. Importantly, the product should therefore be understood as an integrated Wizer.me–TPS intervention, rather than as a test of either component in isolation. During implementation, the experimental group used the developed Wizer.me worksheet with TPS, whereas the control group received the existing instructional condition using conventional materials and its designated learning approach. Consequently, subsequent differences in critical-thinking outcomes represent the performance of these instructional conditions as implemented in the study and cannot be used to separate the independent contribution of Wizer.me from that of TPS.

Figure 1. Worksheet Components: Introductory Display, User Instructions, and Learning Video

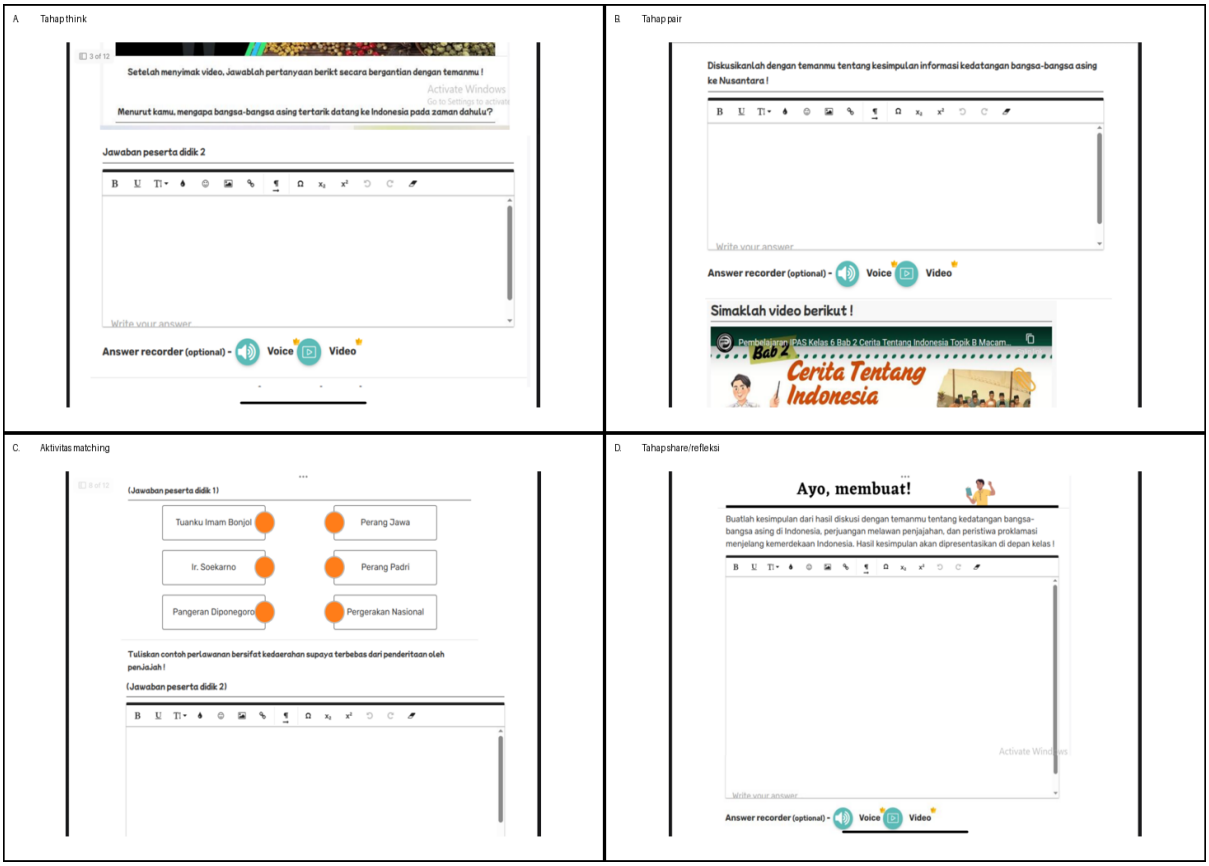

Figure 2. Implementation of the Think, Pair, Matching Activity, and Share/Reflection Stages in the Worksheet

Table 2. Mapping of Woeksheet Components, TPS Activities, and Critical Thinking Skills

Component	Student Activity	Skills Facilitated
Materials, maps, images, and videos	Observing sources and identifying important information	Interpretation and clarification
Think	Answering questions independently based on the sources	Analysis and inference
Pair	Comparing answers, evidence, and reasoning with a partner	Evaluation and regulation of understanding
Share	Presenting conclusions and responding to other pairs' results	Explanation and argumentation
Evaluation and reflection	Connecting historical events with values applicable to life	Evaluation, conclusion, and reflection

3. Product Feasibility and Revision

The content expert evaluation resulted in a score of 35 out of a maximum of 48 (72.92%), indicating that the worksheet had reached a feasible level for further development, subject to revision. The assessment showed that the learning materials were generally aligned with the intended learning objectives, appropriate for the developmental characteristics of elementary students, and relevant to the content requirements of Grade VI Social Studies. Nevertheless, the expert identified an important issue concerning the visibility of the Think Pair Share structure within the worksheet. Although collaborative activities had already been included, the distinction among the think, pair, and share stages was not sufficiently explicit across all learning tasks. This feedback led to targeted revisions rather than changes to the overall content. Instructions for each TPS stage were made more explicit, comparison-oriented prompts were strengthened during the pair stage, and the expected responses or conclusions to be communicated during the share stage were clarified. These revisions ensured that TPS became recognizable as an integral instructional sequence within the worksheet rather than appearing merely as a general form of group activity.

The media expert evaluation produced a higher score of 53 out of 64 (82.81%), indicating that the digital worksheet was feasible from didactic, construction, and technical perspectives. Despite this positive assessment, several aspects of usability and visual organization required improvement before classroom trials. The expert particularly emphasized the need for clearer user instructions, better control of embedded videos to prevent simultaneous playback, more effective organization of multimedia components, and refinement of the overall visual presentation. In response, the product was revised by providing clearer steps for navigating and completing the worksheet, reorganizing the placement and presentation of visual elements, adjusting colors and font sizes to improve readability, and making video control functions more visible to users. These changes were particularly important because the needs analysis had shown that most participating teachers had not previously used Wizer.me. Consequently, the media revisions were directed not only toward improving visual appearance but also toward reducing potential barriers to first-time use and ensuring that technological features supported rather than interrupted the intended learning sequence.

When reported descriptively, the two expert evaluations produced an overall average of 77.67%, providing initial evidence that the developed product was sufficiently feasible to

proceed to user trials after the recommended revisions had been completed. However, the content and media assessments represented different validation domains and were therefore interpreted according to their respective purposes; the combined percentage was used only as a general descriptive summary of product feasibility rather than as evidence that both experts assessed an identical construct. More importantly, expert validation in this study functioned as a formative stage in the development process: the numerical scores identified the overall level of feasibility, while the qualitative recommendations determined the specific modifications made before the product was tested with teachers and students. The feasibility results are consistent with Dewi et al. (2023), who reported that Wizer.me can support the development of feasible digital worksheets that receive positive responses from students. In the present study, however, expert validation represented only the initial evidence of product quality and was subsequently followed by staged practicality trials and an effectiveness evaluation of the integrated Wizer.me–TPS intervention.

4. Product Practicality

The staged user trials demonstrated consistently positive levels of practicality, although some variation was observed as the product was implemented with different numbers of students and in different classroom settings. The one-to-one trialat SD Negeri 237 Palembang produced a practicality score of 0.886 (88.60%), categorized as very practical, while the small-group trial at SD Negeri 40 Palembang resulted in 0.805 (80.45%), categorized as practical. During the broader field trial at SD Negeri 25 Palembang, the score increased to 0.876 (87.63%), returning to the very practical category. Across the three stages, the overall student practicality score reached 0.853 (85.26%), indicating that the worksheet could generally be used by Grade VI students with a high level of acceptance. Examination of individual indicators provided a more detailed picture of this result. The strongest response concerned the clarity of learning objectives (100%), followed by students' perceptions that the worksheet supported critical-thinking development (92.50%) and stimulated curiosity (92.50%). Positive responses were also obtained for the overall design (90%) and the use of images (90%). In contrast, relatively lower responses were found for willingness to reread the material (72.50%), readability of font type and size (77.50%), and enjoyment of completing all activities (80%). These differences suggest that students responded particularly well to the instructional direction and interactive character of the product, while some aspects related to reading comfort and the density of activities remained open to refinement.

The students' written comments helped explain the patterns observed in the quantitative scores and provided a practical basis for subsequent revision. Several students described the worksheet as interesting and easy to use, while others indicated that the questions encouraged them to think more carefully rather than simply reproduce information. At the same time, their responses identified specific usability issues that were less visible in the overall percentage scores. Suggestions concerning larger font sizes, clearer response areas, and a less crowded sequence of activities indicated that high practicality did not mean that every element of the worksheet had reached an optimal form. These observations were used to make focused revisions to the font size, positioning of response fields, consistency of terminology, and sequence of content and activities. The combination of questionnaire scores and written feedback therefore provided complementary evidence: the numerical results indicated a generally high level of student acceptance, whereas the qualitative responses identified specific aspects requiring adjustment before the product was implemented in the effectiveness stage.

Teacher responses provided additional evidence regarding the usability of the worksheet from an instructional perspective. The three teachers participating in the successive trial stages provided full scores, resulting in a teacher practicality value of 1.00 (100%), categorized as very practical. They considered the cover design, color arrangement, instructions, activity sequence, and scoring procedures clear and manageable and viewed the worksheet as supportive of classroom learning. Nevertheless, the 100% score should be interpreted within the context of the small number of teacher respondents, rather than as evidence of universal teacher acceptance. One teacher also emphasized the importance of regular training in creating and managing Wizer.me activities and recommended periodic evaluation of its classroom use. This observation indicates that the practicality of a digital worksheet depends not only on the quality of the product itself but also on teachers' ability to operate and manage the platform consistently. Thus, the teacher and student findings together indicate that the developed worksheet was sufficiently practical to proceed to classroom implementation, while also identifying technical and instructional considerations relevant to its continued use. A consolidated overview of the feasibility and practicality findings is presented in Table 3.

Table 3. Summary of Worksheet Feasibility and Practicality Results

Aspect/Stage	Score Or proportion	Percentage	Category
Material expert validation	35/48	72.92%	Feasible
Media expert validation	53/64	82.81%	Feasible
Average feasibility	—	77.67%	Feasible
One-to-one student trial	0.886	88.60%	Very practical
Small-group student trial	0.805	80.45%	Practical
Field trial students	0.876	87.63%	Very practical
Total student practicality	0.853	85.26%	Very practical
Teacher practicality	1.00	100%	Very practical

5. Product Effectiveness

The effectiveness analysis began by examining students' critical-thinking performance before and after the instructional intervention. At the pretest stage, the two groups demonstrated closely comparable descriptive scores. The control group obtained a mean score of 59.25 (SD = 6.93), while the experimental group obtained a mean score of 58.25 (SD = 6.54). The difference of only one point suggests that the two groups entered the instructional phase with broadly similar levels of measured critical-thinking performance. Following instruction, both groups showed substantial improvement, although the increase was more pronounced in the experimental group. The control group reached a mean posttest score of 83.75 (SD = 5.82), representing an average gain of 24.50 points, whereas the experimental group reached 88.25 (SD = 5.45) with an average gain of 30.00 points. Thus, although improvement occurred under both instructional conditions, the descriptive pattern indicates a larger increase among students who participated in the integrated Wizer.me–TPS learning condition.

Group Statistics

Kelompok	N	Mean Pretest	SD Pretest	Mean Posttest	SD Posttest	Mean Gain
Kontrol	20	59,25	6,93	83,75	5,82	24,50
Eksperimen	20	58,25	6,54	88,25	5,45	30,00

Tests of Normality (Shapiro-Wilk)

Data	Kelompok	Sig.	Keterangan
Pretest	Kontrol	0,075	Normal
Posttest	Kontrol	0,091	Normal
Gain	Kontrol	0,145	Normal
Pretest	Eksperimen	0,046	Tidak normal
Posttest	Eksperimen	0,108	Normal
Gain	Eksperimen	0,064	Normal

Kriteria: Sig. > 0,05 menunjukkan data berdistribusi normal.

Test of Homogeneity of Variances (Levene)

Data	Sig.	Keterangan
Pretest	0,732	Homogen
Posttest	0,661	Homogen
Gain	0,267	Homogen

Kriteria: Sig. > 0,05 menunjukkan varians antarkelompok homogen.

Sumber: direkonstruksi dari Tabel 4.12-4.13 tesis; taraf signifikansi 0,05.

Figure 3. Summary of SPSS Output: Descriptive Statistics, Shapiro–Wilk Normality Test, and Homogeneity Test

Before the differences in learning outcomes were interpreted inferentially, the distributional characteristics and variance assumptions of the data were examined. The Shapiro–Wilk results showed that the posttest and gain scores for both groups satisfied the normality criterion. An exception occurred for the experimental pretest, which produced a significance value of 0.046. Because this value was below the conventional threshold of 0.05, the experimental pretest distribution could not be regarded as normally distributed. This departure from normality was therefore retained as an explicit qualification in interpreting the statistical results rather than being treated as if all datasets met the same distributional assumption. Levene's test, however, indicated homogeneous variances for the pretest, posttest, and gain scores. Accordingly, greater interpretive emphasis was placed on the post-intervention and improvement measures, particularly the posttest, gain, and normalized-gain results, for which the reported assumptions provided stronger support.

Paired Samples Test

Kelompok	t	df	Sig. (2-tailed)	Keterangan
Kontrol (SDN 24)	15,536	19	0,000	Signifikan
Eksperimen (SDN 238)	22,938	19	0,000	Signifikan

Kedua kelompok mengalami peningkatan signifikan dari pretest ke posttest.

Independent Samples Test

Variabel	t	Sig. (2-tailed)	Keterangan
Pretest	0,469	0,642	Tidak signifikan
Posttest	-2,524	0,016	Signifikan
Gain	-2,685	0,011	Signifikan
N-Gain	-3,024	0,004	Signifikan

Pretest setara; perbedaan posttest, gain, dan N-gain signifikan.

Figure 4. Summary of SPSS Output: Paired-Samples t-Test and Independent-Samples t-Test

Within-group comparisons showed that students in both instructional conditions made statistically significant progress from pretest to posttest. The paired-samples analyses yielded $p < 0.001$ for both the control and experimental groups, demonstrating that critical-thinking scores increased significantly following instruction in each group. This result is important because it indicates that improvement was not exclusive to the experimental condition; the control instruction also supported measurable progress. The distinction between the two conditions therefore lies in the magnitude of improvement, rather than in whether learning occurred at all. The experimental group gained an average of 30.00 points compared with 24.50 points in the control group, providing an initial indication that students exposed to the integrated digital and collaborative learning sequence experienced a larger improvement over the instructional period.

The between-group analysis provided further evidence of this difference. The pretest comparison was not statistically significant ($p = 0.642$), which is consistent with the close descriptive means observed before instruction. In contrast, a statistically significant difference emerged in the posttest scores ($p = 0.016$), with the experimental group attaining the higher mean. A similar pattern was found for the raw gain scores, where the difference between groups was statistically significant ($p = 0.011$). Normalized gain provided an additional perspective on the relative improvement achieved from each group's initial performance. The control group obtained a mean N-gain of 0.599, categorized as moderate, whereas the experimental group reached 0.724, categorized as high. The difference in N-gain was also statistically significant ($p = 0.004$). The consistency of the posttest, raw-gain, and normalized-gain comparisons therefore indicates that the experimental condition was associated with a stronger improvement in critical-thinking performance than the control condition.

Table 4. Summary of Effectiveness Test Results

Indicator	Control Class	Experimental Class	Comparison
Number of students	20	20	Equivalent
Mean pretest	59.25	58.25	$p = 0.642$; not significant
Mean posttest	83.75	88.25	$p = 0.016$; significant
Mean gain	24.50	30.00	$p = 0.011$; significant
Mean N-gain	0.599 (moderate)	0.724 (high)	$p = 0.004$; significant
Paired t-test	$p < 0.001$	$p < 0.001$	Both improved significantly

Taken together, the effectiveness results reveal a coherent pattern across the principal outcome measures. Students in both groups improved after instruction, but those in the experimental group demonstrated higher posttest performance, a larger absolute gain, and a higher normalized gain. These findings support the relative effectiveness of the instructional condition implemented in the experimental group. However, the result should be interpreted within the boundaries of the research design. The experimental group received the Wizer.me-based Social Studies worksheet integrated with Think Pair Share, whereas the control group learned through printed worksheets and discovery learning. The statistically significant differences therefore represent the comparative performance of these two instructional conditions as implemented in the study. They do not establish that Wizer.me independently produced the observed improvement, nor do they separate the contribution of TPS from that of the digital worksheet. More precisely, the evidence indicates that the integrated Wizer.me–

TPS intervention was associated with greater improvement in students' critical-thinking skills than the specific control condition used in this study.

Discussion

The findings suggest that the value of the developed product lies in the way digital representation, instructional sequencing, and Social Studies content were brought together within a single learning environment. Wizer.me provided a medium for presenting historical information through text, images, videos, and interactive tasks, while Think Pair Share (TPS) determined how students were expected to engage with those resources. This distinction is important because the presence of digital media alone does not necessarily lead students toward deeper reasoning. Videos, quizzes, and visual materials can remain largely presentational if students are only required to observe or reproduce information. In the present study, however, these features were embedded within a sequence that required students to formulate an initial response, examine that response with a peer, and communicate a refined conclusion. The digital worksheet therefore functioned not merely as a delivery platform, but as a structured environment in which information processing and social interaction were linked to the demands of critical thinking.

The TPS sequence provides a useful explanation for how this instructional structure may have supported students' reasoning. During the think stage, students were given the opportunity to work with information independently before entering a discussion. This individual phase is important because it gives each learner responsibility for constructing an initial interpretation rather than immediately relying on a partner's response. The pair stage then created space for elaboration, as students were required to compare answers, identify differences in reasoning, listen to another perspective, and reconsider the strength of their own explanation. The share stage extended this process by requiring students to communicate conclusions in a form that could be understood by others. Such progression reflects the principle of TPS as a learning structure that balances individual participation with collaborative interaction (Lyman, 1981; Cooper, 2018). In this context, collaboration was not positioned simply as working together, but as a process through which students could test and refine their reasoning.

The relationship between the worksheet activities and critical-thinking development can also be interpreted through the cognitive processes embedded in the product. Students practiced interpretation when they extracted meaning from texts, images, maps, and videos; analysis when they examined causal relationships or connections between historical figures and events; evaluation when they compared responses and considered the adequacy of supporting reasons; inferencewhen they formulated conclusions from the available information; and explanation when they communicated their reasoning during the share stage. This sequence is consistent with Facione's (2020) framework and with the emphasis placed by Ennis (2011, 2018) on clarity of reasoning, credibility of information, inference, and reasoned judgment. The relevance of this mapping is that critical thinking was not treated as a separate outcome assessed only at the end of instruction; rather, the targeted cognitive processes were repeatedly embedded within the learning activities themselves.

The nature of the Social Studies content may also have contributed to the observed pattern of improvement. The topic *"Stories about Our Indonesia"* contains historical events that can be explored through motives, causes, consequences, decisions, and values. Such material creates opportunities for students to move beyond remembering dates, names, and sequences

by asking why events occurred, what consequences followed, and how different decisions shaped historical developments. This orientation is consistent with the view that meaningful history learning should engage students in reasoning about evidence and interpretation rather than simply reproducing factual information (Hartzler-Miller, 2001). The open-ended activities included in the worksheet encouraged this shift by requiring students to explain and justify their responses. In this respect, the instructional design also reflects the broader purpose of Social Studies education, which emphasizes reasoning and decision-making within social contexts (ten Dam & Volman, 2004; Odebiyi & Odebiyi, 2021).

The practicality findings further indicate that the product was generally well received by students, particularly in relation to the clarity of learning objectives, stimulation of curiosity, visual design, and use of images. These responses support the argument that interactive digital environments can facilitate engagement when technological features are aligned with pedagogical purposes. Kaliappen et al. (2021) similarly highlight the potential of Wizer.me to support interaction and the integration of technology, pedagogy, and content, while Dewi et al. (2023) reported positive feasibility and user responses toward Wizer.me-based digital worksheets. The present study extends this line of evidence by examining not only feasibility and user acceptance but also the use of the worksheet within a structured TPS sequence and a quasi-experimental comparison of critical-thinking outcomes. Nevertheless, the relatively lower responses concerning font readability, willingness to reread the material, and enjoyment of completing all activities also demonstrate that high practicality does not imply that all design elements are equally effective.

These usability findings emphasize that digital instructional quality depends on selectivity rather than on the number of interactive features included. Students' suggestions concerning larger fonts, clearer response areas, and reduced activity density indicate that an overly crowded interface can create additional cognitive and visual demands. Digital resources may therefore become less effective when students must simultaneously manage content comprehension, navigation, response entry, and multiple multimedia elements. The revisions made to font size, response-field placement, instructions, and activity sequencing were consequently not merely cosmetic changes; they addressed the usability conditions required for students to focus attention on the intended reasoning tasks. In this sense, the design process demonstrates that multimedia integration should be guided by instructional function and learner accessibility rather than technological novelty alone.

Teacher responses also provide useful, although limited, evidence concerning classroom practicality. The teachers viewed the worksheet positively in terms of instructions, workflow, visual presentation, and scoring procedures, but the full practicality score should be interpreted in relation to the small number of teacher respondents. The suggestion that teachers need continued training in creating and managing Wizer.me activities also indicates that successful use of the product depends partly on teacher competence and institutional support. Swai (2025) emphasizes that the educational value of classroom technology is influenced by how teachers organize interactions and use the information generated through digital activities. Accordingly, implementation beyond the research setting would require more than access to the worksheet itself. Reliable devices, internet connectivity, teacher familiarity with the platform, and opportunities for professional learning are necessary if the digital resource is to be used consistently and meaningfully.

The effectiveness results are broadly consistent with previous studies showing that worksheets can support critical thinking when their tasks are deliberately designed to stimulate

higher-order reasoning (Widodo et al., 2025), as well as with findings regarding media-supported TPS (Oktafiani et al., 2024) and the role of cooperative learning in Social Studies critical thinking (Suprijono & Abbas, 2025). In the present study, students in both groups improved, but the experimental group demonstrated higher posttest, gain, and normalized-gain outcomes. This pattern suggests that the instructional condition experienced by the experimental group provided stronger support for the targeted critical-thinking processes. However, the result should not be attributed to Wizer.me alone. The experimental condition combined the digital worksheet, the TPS sequence, and the structure of the critical-thinking tasks, whereas the control condition used printed worksheets with discovery learning. The observed difference therefore more appropriately represents the performance of the integrated Wizer.me–TPS intervention relative to the specific control condition rather than the independent effect of either Wizer.me or TPS.

This distinction is particularly important when interpreting the significant between-group differences. The higher N-gain in the experimental group may reflect the cumulative contribution of multimedia access, structured individual thinking, peer elaboration, and opportunities to explain conclusions. The study design, however, cannot determine the proportion of improvement attributable to each of these components. Consequently, the findings support an instructional-combination explanation rather than a single-medium explanation. This interpretation is more consistent with the structure of the intervention and avoids overstating the causal role of the digital platform. It also suggests that future research should examine whether similar outcomes occur when Wizer.me is compared under the same learning model, or when TPS is implemented with different media conditions.

Several limitations should therefore be considered when interpreting the findings. First, the developed product addressed only one Grade VI Social Studies topic and was implemented in public elementary schools in Palembang, which limits the extent to which the findings can be generalized to other topics, grade levels, or educational settings. Second, the effectiveness test involved only two classes with 20 students in each group and was conducted over a limited implementation period, so the findings primarily reflect short-term classroom performance. Third, the control and experimental groups differed in both instructional media and learning model, creating a confounding condition that prevents the independent effects of Wizer.me and TPS from being separated. Finally, the experimental pretest distribution did not meet the conventional normality criterion, although the posttest and gain data used in the principal effectiveness comparisons were normally distributed and the reported variances were homogeneous. These limitations do not negate the observed pattern of improvement, but they narrow the scope of the claims that can reasonably be made from the study.

Future research could strengthen the evidence by testing the product across schools with different characteristics, extending implementation to additional Social Studies topics, and involving larger samples over longer periods. A factorial or multi-group design would be particularly useful for separating the contribution of the digital platform from the contribution of TPS by comparing equivalent instructional models across different media conditions. Further studies could also examine whether the intervention influences outcomes beyond immediate critical-thinking scores, such as retention, argumentation quality, collaboration, motivation, and digital literacy. Within the boundaries of the present design, however, the combined findings on feasibility, practicality, and effectiveness indicate that the Wizer.me–TPS worksheet can be considered a promising alternative for Grade VI Social Studies learning when appropriate technological infrastructure and teacher support are available.

Conclusion

This study demonstrates that the integration of Wizer.me and Think Pair Share provides a feasible and practical approach to supporting critical thinking activities in Grade VI Social Studies. The developed worksheet organized the topic *"Stories about Our Indonesia"* through multimedia resources, interactive activities, individual thinking, peer discussion, and classroom sharing. Expert validation and successive user trials confirmed that the product was appropriate for classroom use, while the effectiveness analysis showed improvement in both groups, with the experimental group achieving stronger posttest, gain, and normalized gain outcomes. These findings should be interpreted as evidence of the effectiveness of Wizer.me when integrated with Think Pair Share compared with the control condition using printed worksheets and discovery learning. They do not establish the independent contribution of Wizer.me or Think Pair Share. The principal contribution of this study is therefore the development of a digital Social Studies worksheet that connects multimedia resources and collaborative learning with the critical thinking processes of interpretation, analysis, evaluation, inference, and explanation.

In practice, the developed worksheet can serve as an alternative instructional resource for Grade VI Social Studies when schools have adequate digital devices, internet access, and teachers who are prepared to manage the platform. Teachers should provide sufficient time for students to develop individual responses during the think stage, encourage balanced discussion during the pair stage, and guide students to explain and justify their conclusions during the share stage. The findings should nevertheless be considered within the scope of the study, which involved one Social Studies topic, two classes with relatively small numbers of students, a limited implementation period, and different instructional approaches in the experimental and control groups. Future research should therefore involve larger and more diverse samples, additional Social Studies topics, and longer periods of implementation. Research designs that compare the digital platform and Think Pair Share under equivalent instructional conditions are also needed to clarify the contribution of each component. Further studies may extend the assessment to learning retention, argumentation skills, collaboration, motivation, and digital literacy to provide a broader understanding of the educational value of this instructional approach.

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