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Development of Digital-Based STAD-PjBL Blended Learning Model for Indonesian Language Persuasion Text Learning Class VI Elementary School

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Abstrak

Pembelajaran bahasa Indonesia di SDN 2 Sukaratu menghadapi tantangan berupa ketidakmerataan akses terhadap teknologi pada siswa kelas VI, sementara hasil survei menunjukkan bahwa siswa masih membutuhkan bimbingan tatap muka dari guru. Penelitian ini bertujuan untuk mengembangkan model pembelajaran blended learning yang memadukan pembelajaran luring menggunakan model pembelajaran kooperatif tipe STAD dengan pembelajaran daring menggunakan model Project Based Learning (PjBL) berbasis digital pada materi teks persuasi kelas VI, serta menguji kelayakannya melalui validasi ahli. Penelitian ini menggunakan pendekatan Research and Development (R&D) dengan model ADDIE yang diadaptasi menjadi lima tahapan prosedural, yaitu analisis kebutuhan, perencanaan, pengembangan, implementasi, serta evaluasi dan revisi. Produk yang dikembangkan berupa situs web/Learning Management System (LMS) dan modul elektronik (e-modul). Kelayakan produk diuji melalui validasi oleh tiga ahli, yaitu ahli desain pembelajaran, ahli materi, dan ahli multimedia, menggunakan angket berskala, yang kemudian dilanjutkan dengan uji coba individual terhadap 20 siswa. Hasil validasi ahli menunjukkan bahwa persentase kelayakan desain pembelajaran sebesar 84,2%, materi sebesar 86,5%, dan multimedia sebesar 83,8%. Ketiganya termasuk dalam kategori sangat layak berdasarkan kriteria interpretasi persentase kelayakan. Hasil uji coba individual menunjukkan rata-rata N-Gain sebesar 0,61 yang termasuk dalam kategori sedang. Dengan demikian, model pembelajaran blended learning STAD-PjBL berbasis digital yang dikembangkan dinyatakan layak digunakan sebagai salah satu alternatif strategi pembelajaran bahasa Indonesia di sekolah dasar dengan keterbatasan akses terhadap teknologi. Namun, pengujian efektivitas terhadap hasil belajar masih memerlukan penelitian lanjutan berdasarkan data uji coba lapangan.

Kata Kunci: *Blended Learning; STAD; Project Based Learning; Teks Persuasi; Sekolah Dasar.*

Abstract

Indonesian language instruction at SDN 2 Sukaratu faces unequal technology access among sixth-grade students, while a student survey indicated a continued need for face-to-face guidance. This study

develops a blended learning model combining offline instruction using the STAD cooperative model with online instruction using a digital-based Project Based Learning (PjBL) model for the Persuasive Text unit in Grade VI, and examines its feasibility through expert validation. The study used a Research and Development approach following the ADDIE model adapted into five procedural stages: needs analysis, design, development, implementation, and evaluation/revision. The products were a learning website/Learning Management System (LMS) and an e-module (e-module). Feasibility was examined through validation by three experts (instructional design, content, multimedia) using scaled questionnaires, followed by a one-to-one trial with 20 students. Expert validation showed feasibility scores of 84.2% (design), 86.5% (content), and 83.8% (multimedia), all in the very feasible category based on established percentage-interpretation criteria. The one-to-one trial showed a mean N-Gain of 0.61 (medium category). The digital-based STAD-PjBL blended learning model is feasible as an alternative Indonesian language teaching strategy for elementary schools with limited technology access, while its effectiveness on learning outcomes requires further study based on field-trial data.

Keywords: *Blended Learning; STAD; Project Based Learning; Persuasive Text; Elementary School.*

INTRODUCTION

Learning is a deliberate effort to acquire new knowledge and skills that are characterized by behavioral changes as a result of learning. For elementary school students, the role of teachers is still a factor that greatly determines the success of the learning process, because technology has not been able to completely replace the personal guidance needed by children at the developmental stage of concrete thinking towards abstract.

SDN 2 Sukaratu faces the problem of technology access gap among grade VI students. Many students do not have adequate internet access or digital devices to support full online learning. The results of the survey of students also show that the majority of students prefer face-to-face learning because it allows direct interaction with teachers and peers. This condition is in line with the finding that the implementation of blended learning in Indonesian elementary schools is still limited and its acceptance depends on the readiness of the infrastructure and student learning motivation (Amelia, 2025), as well as on thematic learning that shows increased motivation when blended learning is applied in a structured manner (Firdaus et al., 2018). The gap in access to devices and the internet is also documented at the K-12 level and has an impact on student learning outcomes (Pierce & Cleary, 2024).

This condition encourages schools to choose a blended learning approach, which is a learning model that comparatively combines face-to-face learning (offline) and distance learning (Graham, 2006; Rafiola et al., 2020). The implementation of blended learning at the elementary school level has been studied in Indonesia (Zahara et al., 2022) and is reported to be related to increased motivation and learning outcomes (Mustanil et al., 2022; Puspitasari et al., 2022), while meta-analysis at the K-12 level reported the positive effect of blended learning on learning outcomes compared to face-to-face learning (Li & Wang, 2022). In the face-to-face sessions, the STAD (Student Teams Achievement Division) Type Cooperative Learning Model was used which emphasized heterogeneous teamwork and individual responsibility in the group (Slavin, 1995), while in the online session, a digital-based Project Based Learning (PjBL) Model was used which was rooted in John Dewey's constructivist

thinking about learning through real experience (Dewey, 1938). Both models were based on the constructivist theories of Jean Piaget and Lev Vygotsky which emphasized the importance of social interaction and knowledge construction through direct experience (Piaget, 1973; Vygotsky, 1978), which in the context of this research was updated through the latest empirical studies of the digital learning environment, instructional design, and technology integration in blended learning (Amelia, 2025; Rafiola et al., 2020; De Bruijn-Smolders & Prinsen, 2024; Li & Wang, 2022), who consistently show that instructional design that places guided social interaction on the face-to-face component and project-based tasks on the online component is in line with constructivist principles about learning as an active and contextual knowledge construction process.

The placement of STAD in the offline component and PjBL in the online component is not just the placement of two models in two different learning modes, but one integrated instructional design that supports each other functionally. STAD functions to build a guided understanding of concepts through face-to-face interaction, heterogeneous teamwork, and direct feedback from teachers, which is suitable for the stage of introduction to the structure and linguistic rules of abstract persuasion texts for grade VI students. The results of the understanding formed in the STAD session then become the basis for students to work on projects in the online PjBL session, namely producing and presenting persuasive speeches in the form of digital videos. Thus, STAD acts as the initial knowledge construction stage, while PjBL acts as the application and production stage, so that the two models form a continuous learning flow, rather than two separate strategies that are only combined based on the mode of delivery.

A number of studies show that the application of the STAD Model to learning Indonesian in elementary schools has been proven to improve student learning outcomes and motivation, both in listening and storytelling skills (Zacharias, 2021) and in thematic learning in general (Sumilat & Matutu, 2021; Fatchiyah et al., 2024). Similar findings were also reported on the application of media-assisted STAD in grade VI students (Al Fisani et al., 2025; Wangge & Sar'iyyah, 2022). The synthesis of meta-analyses on cooperative learning (Güngör et al., 2026) and on the STAD method in English learning (Hadeli et al., 2022) also reported a positive impact on learning outcomes. On the other hand, the application of Project Based Learning has been proven to be able to develop the creativity and learning outcomes of elementary school students in various subjects (Fahrezi et al., 2020; Rohana & Wahyudin, 2016; Zhang & Ma, 2023), including when systematically designed through a research-based development approach (Nirmayani & Dewi, 2021). However, a systematic review at the kindergarten and elementary school levels concluded that the evidence for the effectiveness of PjBL is still limited and inconclusive (Ferrero et al., 2021). However, these studies generally apply STAD or PjBL alone to one learning mode, and studies on blended learning in elementary schools are generally still descriptive without designing the integration of two active learning models with different characteristics in a single procedural framework (Amelia, 2025). The research gap that is specifically answered by this study is the lack of a blended learning model that explicitly combines STAD (for face-to-face concept reinforcement) and digital-based PjBL (for online work production) in one feasible procedural design, especially for grade VI text and persuasive speech materials in the context of schools with unequal access to technology.

The material that is the focus of development is Persuasion Texts in Chapter 5 of Indonesian Language Class VI Phase C of the Independent Curriculum, which requires students to be able to understand the structure and linguistic rules of persuasive texts, convey ideas logically and persuasively, produce persuasive texts orally and in writing (persuasive

speeches), and show confidence and responsibility in expressing opinions. The learning objectives include cognitive, affective, and psychomotor domains, so strategies and teaching materials are needed that are able to develop these three domains in an integrated manner.

Previous research has shown that STAD and PjBL have been used to support active learning, but the two models are generally applied separately. STAD is more widely used in face-to-face learning to build group interaction, individual responsibility, and concept understanding through student-to-student cooperation (Slavin, 1995; Sumilat & Matutu, 2021; Fatchiyah et al., 2024). Meanwhile, PjBL is more often used to develop problem-solving skills, creativity, and product generation through a series of project-based activities (Fahrezi et al., 2020; Zhang & Ma, 2023). Research on blended learning also shows that a blend of offline and online learning can support learning flexibility and academic achievement, but its success is highly dependent on infrastructure readiness, teacher support, and students' ability to use technology (Graham, 2006; Li & Wang, 2022; Zahara et al., 2022).

However, these studies have not specifically explained how STAD and PjBL can be placed in one mixed learning flow that has a clear division of functions. In this study, STAD was used in offline sessions to build an initial understanding of the linguistic structure and rules of persuasive texts through teacher explanations, discussions, and group work. Digital-based PjBL was used in online sessions as a stage of application and production of works through the preparation of manuscripts, recordings, and uploads of persuasive speech videos. Thus, the contribution of this research is not just to combine two learning models, but to design a functional relationship between the two in a single learning sequence.

The novelty of this research lies in the design of a digital-based STAD-PjBL blended learning model that connects face-to-face concept reinforcement with the application of knowledge through digital projects. The model was developed in the form of a website/LMS and e-module for class VI persuasion text materials in the context of schools with unequal access to technology. The position of this research is as a learning design development and initial testing of product feasibility, not as a comparative effectiveness test. Therefore, the research contribution is limited to the design of model integration, development of digital devices, and initial information regarding product feasibility based on expert assessment.

Based on these gaps, this study aims to: (1) develop a blended learning design that integrates STAD in offline sessions and digital-based PjBL in online sessions; (2) produce websites/LMS and e-modules for class VI persuasion text learning; and (3) describe the feasibility of designs and products based on available expert validation information.

METHOD

This study uses the Research and Development (R&D) approach to produce a web/LMS-based blended learning model and e-module on Indonesian persuasion text materials in class VI. The development model adopted is the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model which is translated into five procedural stages of research, namely needs analysis, planning, development, implementation, and evaluation and revision (Branch, 2009). Table 1 shows the compatibility between the original ADDIE stage and the procedural stage adapted in this study, so that the methodological consistency between the model reference and the actual research steps carried out is explicit.

Table 1. Suitability of the ADDIE Model Stage with the Procedural Stage of the Research

ADDIE Stage (Branch, 2009)	Procedural Stage of Research	Main Activities
Analysis	Needs Analysis	Identify students' difficulties in understanding the linguistic structure and rules of persuasive texts, limited digital access, and interactive media needs
Design	Planning	Formulation of TIU/ICT, preparation of materials, determination of STAD (offline) and digital PjBL (online) strategies, evaluation design
Development	Development	Creation of websites/LMS and e-modules, preparation of evaluation instruments, validation by design, material, and multimedia experts
Implementation	Implementation	Individual trials of revised products
Evaluation	Evaluation and Revision	Analyze the results of questionnaires, observations, and learning outcomes for continuous product improvement

The needs analysis stage resulted in the finding that grade VI students of SDN 2 Sukaratu had difficulty understanding the structure of persuasive speeches, using persuasive sentences, and delivering speeches confidently, and that the availability of digital devices among students was uneven. The planning stage included the formulation of General Instructional Objectives and Special Instructional Objectives, the preparation of materials, the determination of learning strategies, and the design of evaluation systems. The development stage produced two types of teaching materials, namely learning websites/LMS and e-modules, which were then validated by experts before being tested.

Subject and Procedure of the Trial

The subjects in this study consisted of three expert validators, namely learning design experts, material experts, and multimedia experts. The product trial procedure was designed through three levels, namely one-to-one evaluation, small group evaluation, and field trial in one full class. At the research stage reported in this article, only an individual trial has been carried out, namely on 20 grade VI students of SDN 2 Sukaratu with diverse initial abilities (pretest score 54–63, average 58.45); Small group trials and field trials are planned as the next stage of research.

Research Instruments

The data collection instruments in this study consist of four types. First, the expert validation questionnaire which is prepared on a five-point Likert scale, consists of 19 statements for learning design experts, 21 statements for material experts, and 21 statements for multimedia experts. The dimensions and indicators assessed in each questionnaire are presented in Table 2.

Table 2. Dimensions and Indicators of Validation Instruments

Dimensions	Example of Indicators	Respondents
Learning Materials	Suitability of the material for the purpose; structure of presentation; accuracy of linguistic concepts; depth of material; up-to-date examples of texts; suitability of exercises and evaluations	Material Expert

Learning Plan	The accuracy of the formulation of TIU/ICT; the relevance of TIU-ICT to the material; the suitability of the STAD/PjBL strategy with the goals and characteristics of the students; the relevance of the evaluation to the instructional objectives	Learning Design Expert
Website/LMS and Multimedia	Visual display; media quality (images, sound, text, animations, videos); ease of navigation; suitability of design with student characteristics; user interface	Multimedia Expert

The scale descriptors on the expert validation questionnaire are score 1 = very unfeasible, score 2 = not feasible, score 3 = moderately feasible, score 4 = feasible, and score 5 = very feasible.

Second, the learning outcome test instrument is in the form of multiple-choice questions to measure the cognitive domain at the C1 (knowing) to C4 (analyzing) levels. The grid of learning outcome test questions is presented in Table 3.

Table 3. Learning Outcome Test Question Grid

Indicator	Domain	Instrument Shape
Identify the structure of persuasive texts	Cognitive (C1–C2)	Multiple Choice
Determining language rules	Cognitive (C2)	Multiple Choice
Define a persuasive topic	Cognitive (C3)	Multiple Choice
Structure text outlines	Cognitive (C3–C4)	Multiple Choice
Developing persuasive texts	Psychomotor	Performance Tests
Delivering a persuasive speech	Psychomotor	Performance Tests
Demonstrate confidence	Affective	Observations

Third, observation sheets are used to assess the affective realm in the form of students' confidence, responsibility, and activeness during discussions and presentations. Fourth, performance test rubrics are used to assess students' ability to develop and deliver persuasive speeches in the psychomotor realm.

Implementation Procedure

The implementation stage is designed through three types of trials. Individual trials are directed to obtain an initial indication of improved learning outcomes through the measurement of pretest and posttest scores. Small group trials are planned to obtain information on student responses, formative quiz results, activeness, and constraints of use, while field trials in one full class are planned to analyze the results of pre-test and post-test as well as the achievement of learning objectives. This article reports the implementation and results of individual trials (20 students), in the form of normalized pretest, posttest, and gain scores; small group trials and field trials have not been implemented at this stage of the study and are planned advanced stages. Individual trial data is used as one of the basis for product revision at the evaluation and revision stages.

Data Analysis Techniques

The data from expert validation results were analyzed in a quantitative descriptive manner by calculating the percentage of feasibility using the formula:

$$\text{Eligibility Percentage} = (\Sigma \text{ score obtained} \div \Sigma \text{ maximum score}) \times 100\%$$

The percentages obtained were then interpreted into the eligibility category following the criteria in Table 4, which were adapted from the eligibility score interpretation criteria commonly used in development research (Akbar, 2013).

Table 4. Eligibility Score Interpretation Criteria

Score Range (%)	Eligibility Categories
81–100	Highly Worth It
61–80	Worthy
41–60	Quite Decent
21–40	Less Worthy
0–20	Not Eligible

Qualitative data in the form of comments and open-ended suggestions from expert validators were analyzed descriptively by grouping comments based on highlighted aspects (material, design, or media), then summarized thematically to formulate product revision points. Student response data, formative quiz results, and activeness observations from small group trials are planned to be analyzed descriptively to identify constraints of use and effectiveness of group interactions at the advanced stage, as small group trials have not been implemented at this stage of the study. Pretest and posttest scores of individual trials were analyzed descriptively (mean and standard deviation) and calculated normalized gain (N-Gain) using the formula g = (posttest score − pretest score) ÷ (maximum score − pretest score) (Hake, 1998), with the categories of high ($g \geq 0.70$), medium ($0.30 \leq g < 0.70$), and low ($g < 0.30$). This article reports results at the needs analysis, product development, expert validation, and individual trial stages; the results of small group trials and field trials are beyond the scope of the data reported here and are presented as a note in the Research Limitations section.

RESULTS

Product Needs and Design Analysis Results

The results of the needs analysis showed that the limited access to digital devices in some grade VI students of SDN 2 Sukaratu did not allow the full implementation of online learning, while students' preference for face-to-face interaction demanded that offline learning sessions be maintained. Based on these findings, a blended learning model was designed that integrates offline sessions using the STAD Type Cooperative Model and online sessions using digital-based PjBL.

The resulting product includes three forms of models, namely a conceptual model that describes the relationship between learning components; a procedural model that describes the development stages for each STAD and PjBL strategy; and a physical model in the form of a real form of the product, namely an interactive learning website, a digital e-module, and an assessment tool. The learning website contains eight main components, namely the home page, learning objectives, learning materials, text examples and analysis, interactive quizzes, independent exercises, PjBL digital projects, and final evaluations, while the e-module is composed of ten components ranging from the cover to reflection and bibliography.

Integrated STAD-PjBL Blended Learning Model

To clarify how STAD and PjBL are integrated as a single instructional design rather than two stand-alone models, Table 5 and Table 6 describe the steps for implementing each model at each procedural stage, while Figure 1 visually presents the flow of the integration of the

two, including the transition point from offline to online sessions and the linkage between websites/LMS and e-modules.

Table 5. Application of the STAD Model in Offline Sessions per Procedural Stage

Stages	STAD Implementation Steps	Implementation of Persuasion Materials	Web & E-Module Integration
Needs Analysis	Identify students' initial abilities and learning needs	Teachers find students having difficulty composing speech structures and persuasive language	Analysis of pretest results on the website and initial observation
Planning	Compiling lesson plans, forming heterogeneous groups, preparing materials & quizzes	Defining indicators: understanding the structure, composing, and delivering the speech	Setting up e-modules and online quizzes
Development	Developing teaching materials and evaluation instruments	Modules contain theory, speech examples, group exercises	The website contains sample videos and interactive quizzes
Implementation	Presentation of group work → material → individual quizzes → group awards	Students learn concepts → group discussions → compose texts → individual quizzes	Materials from e-modules; quizzes through the website
Evaluation	Assess individual outcomes and group scores	Formative tests and cooperative observations	Automatic value recap of the website system

Table 6. Application of Digital-Based PjBL Model in Online Sessions per Procedural Stage

Stages	Steps to Implement PjBL	Implementation of Persuasion Materials	Web & E-Module Integration
Needs Analysis	Identify students' interests and digital literacy abilities	Students need contextual and creative learning	Digital surveys through websites
Planning	Define a project: create a persuasive speech video	Theme: school environment or learning discipline	Project guide in e-module
Development	Develop project rubrics, technical guidelines, and timelines	Assessment manuscript templates and rubrics	Electronic modules and classroom LMS
Implementation	Determination of fundamental questions → project planning → monitoring → presentation of results	Students compile a script → record a video → upload the results	Upload videos on the learning website
Evaluation	Product, process and reflection assessment	Rubrics include structure, language, expressions	Assessment and reflection are carried out digitally

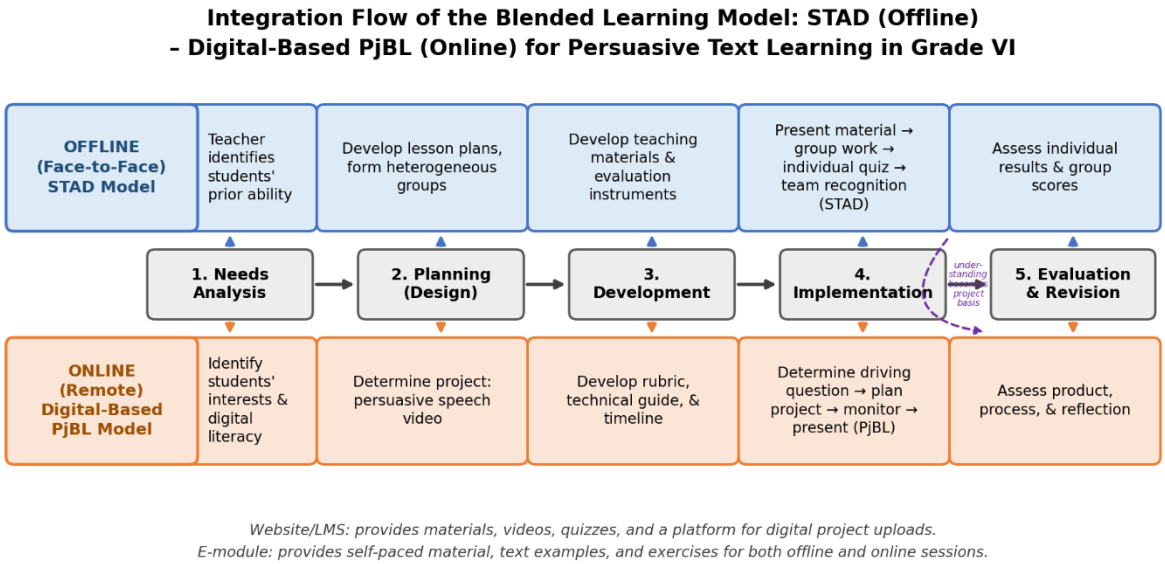


Figure 1. Blended Learning Model Integration Flow STAD (Offline) – Digital-Based PjBL (Online)

As shown in Table 5, Table 6, and Figure 1, the understanding of concepts built through STAD at the implementation stage (presentation of materials, group discussions, text preparation) becomes the basis for students to carry out the PjBL project, namely drafting, recording, and uploading persuasive speech videos. The website/LMS acts as a forum for materials, videos, quizzes, and digital project uploads, while e-modules act as independent learning materials that can be accessed in offline and online sessions. Thus, the transition from offline sessions to online sessions occurs in a structured manner at the implementation stage, rather than as two separate activities.

Expert Validation Results

Product validation is carried out by three experts according to their field of expertise, using the instruments and interpretation criteria outlined in the Methods section. The results of the validation of learning design experts are presented in Table 7.

Table 7. Learning Design Expert Validation Results

No	Aspects Assessed	Score (%)	Categories
1	Goal-oriented	84,5	Highly Worth It
2	Learning clarity	87,0	Highly Worth It
3	Learning plan qualifications	80,0	Worthy
4	Influence on students	85,2	Highly Worth It
	Overall Score	**84,2**	**Highly Worth It**

The learning design, which includes the formulation of instructional objectives, the suitability of the STAD and PjBL strategies with the learning objectives, as well as the integration of objectives, materials, and evaluations, was considered very feasible with an overall score of 84.2%. Qualitative comments from learning design experts after being summarized thematically highlighted three things: the formulation of learning objectives to use more measurable operational verbs, the addition of a portion of speech practice exercises, and the preparation of instructions for the use of e-modules in a more systematic manner.

The results of the validation of the subject matter experts are presented in Table 8.

Table 8. Validation Results of Learning Material Experts

No	Aspects Assessed	Score (%)	Categories
1	Goal-oriented	86,0	Highly Worth It
2	Clarity of learning materials	88,5	Highly Worth It
3	Depth and breadth of material	84,0	Highly Worth It
4	Influence on students	87,3	Highly Worth It
Overall Score		**86,5**	**Highly Worth It**

The overall material validation score of 86.5% indicates a very feasible category, with the highest score in the aspect of clarity of learning material (88.5%). The material expert's qualitative comments focused on the addition of examples of persuasive speech texts that are closer to students' lives, the addition of speech structure markers, and variations in the difficulty level of persuasive sentence analysis exercises.

The results of multimedia expert validation are presented in Table 9.

Table 9. Multimedia Expert Validation Results

No	Aspects Assessed	Score (%)	Categories
1	Product Display	83,0	Highly Worth It
2	Multimedia quality	80,5	Worthy
3	Navigation	86,5	Highly Worth It
4	User:StuRat	80,0	Worthy
5	Product strength	87,0	Highly Worth It
Overall Score		**83,8**	**Highly Worth It**

The overall multimedia validation score of 83.8% (very decent) indicates that the display, navigation, and strength of website and e-module products have been adequate, although the multimedia quality and user interface aspects are in the decent category and require further refinement, especially in the color combination, font size, and the addition of audio features for speech examples.

Individual Trial Results

The individual trial was conducted following the procedure described in the Methods section and involved 20 students with diverse initial abilities. The results of the pretest, posttest, and normalized gain (N-Gain) are presented in Table 10.

Table 10. Pretest, Posttest, and Individual Trial Normalized Gain Scores

No	Student Name	Pretest Score	Posttest Score	Gain (g)
1	PD1	55	80	0,56
2	PD2	60	85	0,63
3	PD3	58	82	0,57
4	PD4	62	88	0,68
5	PD5	57	83	0,60
6	PD6	59	84	0,61
7	PD7	61	86	0,64
8	PD8	56	81	0,57
9	PD9	60	85	0,63
10	PD10	58	82	0,57
11	PD11	54	78	0,52

12	PD12	63	89	0,70
13	PD13	59	84	0,61
14	PD14	57	82	0,58
15	PD15	60	86	0,65
16	PD16	58	83	0,60
17	PD17	56	81	0,57
18	PD18	62	88	0,68
19	PD19	55	80	0,56
20	PD20	59	84	0,61
Average		**58,45**	**83,55**	**0,61**

Table 10 shows that the average pretest score of 58.45 students (SD = 2.52; range 54–63) increased to 83.55 in the posttest (SD = 2.93; range 78–89), or an average increase of 25.10 points. All students experienced an increase in scores, with an average normalized gain of 0.61 (SD = 0.05) which was included in the medium category according to the criteria of Hake (1998). A total of 19 out of 20 students were in the medium category (g = 0.52–0.68), one student (PD12) reached the high category (g = 0.70), and no students in the low category. These results provide an early indication that the use of products at the individual trial stage was followed by an increase in learning outcome scores; However, because it involves one group of students without a comparison group, these findings cannot be used to conclude the effectiveness of the model (see the Research Limitations section). The data at this stage are limited to pretest, posttest, and gain scores and are not used to infer material readability, ease of use of the website/e-module, student response, activeness, or technical constraints.

DISCUSSION

All three aspects of expert validation (84.2% learning design, 86.5% material, and 83.8% multimedia) were in the very feasible category based on the criteria in Table 4, which indicates that the developed digital-based STAD-PjBL blended learning model has sufficient design, content, and display quality for use in class VI persuasion text learning. It should be emphasized that the score is a measure of product feasibility based on expert assessment, not a measure of product effectiveness in improving student learning outcomes; although the results of individual trials (Table 10) show an improvement in scores with an average N-Gain of 0.61 (medium category), the design of a single-group without a comparator on a limited number of participants is not sufficient for an effectiveness claim, which requires empirical evidence from field trials with comparator groups (see the section on Research Limitations). Despite these limitations, these findings demonstrate the specific contribution of digital technology components to learning design: websites/LMS allow for continuous storage and access of materials, videos, and quizzes across offline and online sessions, while e-modules provide self-paced learning materials that do not rely on a stable internet connection, so that these two components directly address the limitations of technology access that are the background of the research, rather than just an administrative complement to the learning model.

These feasibility findings are in line with the principles of blended learning that emphasize a balance between direct social interaction and the flexibility of independent learning (Graham, 2006; Rafiola et al., 2020; Tong et al., 2022), as underpinned by Piaget's and Vygotsky's theories of constructivism (Piaget, 1973; Vygotsky, 1978). As explained in the Integrated STAD-PjBL Blended Learning Model section, the placement of STAD in offline sessions and PjBL in online sessions reflects the complementary division of instructional

functions: STAD strengthens the understanding of the concepts of linguistic structure and rules of persuasive texts through face-to-face interaction, in line with the findings that STAD consistently improves Indonesian language learning outcomes and motivation of elementary school students (Zacharias, 2021; Sumilat & Matutu, 2021; Al Fisani et al., 2025; Fatchiyah et al., 2024), while PjBL provides space for independent and creative production of works for students who have digital access, reinforcing the results of previous research showing that PjBL is effective in improving the creativity and learning outcomes of elementary school students (Fahrezi et al., 2020; Rohana & Wahyudin, 2016; Zhang & Ma, 2023), that video production can strengthen the oral language skills of elementary school students (Colognesi et al., 2023), as well as that the development of a systematically designed PjBL model through an R&D approach has proven to be valid and feasible to use (Nirmayani & Dewi, 2021), as also reported in the development of interactive e-books for writing argumentative paragraphs in grade IV (Bilqis et al., 2023).

The integration of the two models results in a continuous learning flow as illustrated in Figure 1: understanding concepts in offline sessions becomes the basis for group collaboration, followed by the production of works in online sessions, and ends with joint reflection. This flow allows learning to be not only oriented towards test achievements, but also on the development of 21st century competencies, such as collaboration, communication, creativity, and critical thinking, which are demanded by the learning outcomes of Bahasa Indonesia Phase C of the Independent Curriculum. However, the aspects of multimedia quality and user interfaces that are still categorized as feasible show the need for further refinement so that the product is more optimally used by students with various levels of digital literacy ability, as well as a concern in the study of the application of blended learning in elementary schools in general (Amelia, 2025). A systematic review also shows that student involvement is an important aspect in the effectiveness of blended learning (De Bruijn-Smolders & Prinsen, 2024).

This article reports results at the needs analysis, product development, expert validation, and individual trials of a larger developmental research series. Individual trial data (n = 20) were limited to pretest and posttest scores without a comparison group, while small-group trials and field trials (including number and characteristics of participants, student responses, and pre-test and post-test results) have not been implemented at this stage of the study and therefore the data are not empirically available. Thus, the conclusions about the feasibility of the models in this article are limited to expert validation evidence and preliminary indications of individual trials, while conclusions about the effectiveness of the models on improving student learning outcomes require reporting of field trial data in follow-up studies.

CONCLUSION

This research produces a blended learning model that combines the STAD Type Cooperative Model in offline sessions and digital-based PjBL in online sessions, in the form of a website/LMS and e-module, for Indonesian persuasion text materials for grade VI elementary schools. The novelty of this research lies in the design of STAD and PjBL as an integrated instructional design, namely STAD functions to build face-to-face understanding of concepts and PjBL functions to facilitate online production of works, which are specifically designed to overcome limited access to technology in elementary schools. The results of expert validation showed that this model was in the very feasible category, with a learning design feasibility score of 84.2%, material of 86.5%, and multimedia of 83.8%, thus answering the research objectives to develop and test the feasibility of the model. Individual trials on 20

students showed an increase in scores with an average N-Gain of 0.61 (medium category); However, this conclusion is limited to the feasibility aspect of the product and the initial indication of score improvement, while the conclusion regarding the effectiveness of the model on student learning outcomes cannot be stated because the field trial data has not been reported in this article.

Indonesian schools and teachers at the elementary school level are advised to consider this digital-based STAD-PjBL blended learning model as an alternative learning strategy, especially in educational units with uneven technology access conditions, while still paying attention to improvements in multimedia quality aspects and user interfaces based on multimedia expert input. For further researchers, it is recommended to carry out and report fully on small group and field trials (including the number and characteristics of participants as well as pre-test and post-test results), as well as conduct appropriate statistical analysis (e.g. tests that differ from comparison groups) to measure the effectiveness of the model in empirically improving student learning outcomes.

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