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Development of KoGOPEQ Interactive Learning Videos to Improve the Independent and Honest Characters of Students

Putu Pradnyadewi, IM Ardana, Gede Suweken
Universitas Pendidikan Ganesha, Singaraja, Indonesia
dewaayuputupradnyadewi@gmail.com; ardanaimade@yahoo.com

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Abstract

Although the integration of character education and technology in mathematics learning has received increasing attention in prior studies, research specifically examining the combined use of interactive video platforms with the Teacher–Parent–Student Collaboration (KoGOPEQ) model to simultaneously enhance independent and honest character alongside cognitive understanding remains limited. This study aims to design, implement, and evaluate the effectiveness of an interactive learning video based on the KoGOPEQ model in improving the independent and honest character of fourth-grade elementary students during fraction lessons. Employing a research and development (R&D) approach, the study adopts the Plomp and Nieveen model—comprising preliminary research, prototyping, and assessment phases—and involves 48 fourth-grade students as primary respondents. Data were collected using expert validation sheets, practicality questionnaires for teachers and students, character observation sheets, and pretest–posttest instruments, and were analyzed using descriptive qualitative and quantitative techniques, including gain score calculations. The findings indicate that the developed interactive video is highly valid (score = 4.50), very practical (83.58%), and effective, with gain scores of 0.80 for independence and 0.77 for honesty, as well as a substantial increase in mathematics learning outcomes from an average of 41.78 to 72.18. These results

contribute to the theoretical development of multimedia learning within collaborative school–family frameworks and expand understanding of how digital tools can holistically support students' character and cognitive growth. The study concludes that KoGOPEQ-oriented interactive learning videos play a crucial role in bridging the gap between academic difficulty and character building, and recommends that educators and parents actively adopt this collaborative medium to support student development. The implications include theoretical contributions to the literature on interactive instructional design and practical recommendations for educational institutions seeking to strengthen the *Pancasila* student profile. Furthermore, this study highlights opportunities for future research on extending the model to other character dimensions and subject areas.

Keywords: Interactive Learning Video; KoGOPEQ Model; Independent Character; Honest Character; Fraction Learning

INTRODUCTION

Education in Indonesia is currently focused on shaping a generation that is not only cognitively intelligent but also possesses strong character and the capacity for independent learning. Ideally, every student should develop their intellectual potential while simultaneously internalizing the noble values of Pancasila, such as independence and honesty, which serve as the essential foundation for personal and national progress. Independence allows students to regulate themselves in the learning process, while honesty acts as the basis of integrity. However, the reality in the field reveals a significant gap between these expectations and the actual situation. Internationally, studies have shown that character is a critical determinant of future success; for instance, research in the United States indicates that 90% of job dismissals are caused by poor behavior, specifically a lack of honesty and responsibility (Boshra et al., 2021). Domestically, the situation is equally concerning. A survey by the Ministry of Religion shows a decline in the student character index from 0.71 in 2019 to 0.68 in 2021, suggesting that educational practices have not yet optimally addressed character building. This is evidenced by the prevalence of bullying, brawls, and a lack of manners in school environments, alongside complaints from parents and teachers regarding students' lack of independence in completing tasks (Juniaris & Wijayaningsih, 2022). Furthermore, although cognitive education has advanced, the character of honesty remains

fragile and requires intensive cultivation, as current implementations are viewed by many as failing to fully instill noble morals (Ansori, 2020).

In addition to these character issues, specific academic challenges persist, particularly in mathematics education at the elementary level. Fraction material is widely recognized as a difficult topic, with students often struggling to understand fraction concepts, making errors in operations involving numerators and denominators, and lacking precision in calculations (Syukra et al., 2025). These difficulties are exacerbated by the abstract nature of fraction operations (Amir & Andong, 2022). The problem extends to the home environment, where parents often express concern and an inability to guide their children effectively due to a lack of pedagogical content knowledge and technological skills (Cahyati & Kusumah, 2020). Moreover, despite regulations encouraging technology use, many educators remain hesitant or lack the understanding to utilize technology-based learning media such as interactive videos (Muhammad Misbahudholam & Aini Kurratul, 2024).

In response to these complex issues, this study proposes the development of interactive learning videos as an innovative solution. Educational experts argue that learning videos are effective in enhancing student interest and understanding by presenting material through engaging visual and auditory means (Muchib & others, 2025; Sari et al., 2025), while simultaneously fostering active student engagement (Qadriani et al., 2021; Shafa & Yunianta, 2022). To maximize this potential, the video developed in this study integrates the Teacher-Parent-Student Collaboration and Emotional Quotient (KoGOPEQ) model. This approach is based on expert consensus that collaboration in learning improves quality and effectiveness (Salmiati, 2021) and has the potential to develop students' Emotional Quotient (EQ). EQ is theoretically crucial because it involves the ability to recognize, manage, and express emotions effectively, serving as a vital foundation for forming independent and honest character as well as supporting academic understanding (Damayanti et al., 2021). Furthermore, the use of the Edpuzzle platform is incorporated to optimize interactivity, preventing students from skipping crucial content and enabling teachers to monitor progress efficiently (Pulukuri & Abrams, 2020).

A review of previous research reveals that while the use of audio-visual media and interactive videos to increase student learning enthusiasm has been extensively documented (Prehanto et al., 2021), and studies have confirmed that interactive videos improve student engagement and understanding (Qadriani et al., 2021; Shafa & Yunianta, 2022), a specific gap

remains. Existing literature largely focuses on cognitive outcomes or character development in isolation, often neglecting the crucial role of parents in the digital learning ecosystem. There is a lack of comprehensive research that synergistically combines the specific utilization of the Edpuzzle platform for interactive features with the explicit implementation of the KoGOPEQ mode, which actively involves the triad of teachers, parents, and students, while maintaining a dual focus on enhancing independence and honesty alongside cognitive mastery of fraction material.

The novelty of this research lies in filling this gap by establishing a holistic learning trajectory supported by relevant theories. Theoretically, this approach is grounded in the concept of multimedia learning, where the combination of seeing, hearing, and doing facilitated by the interactive features of Edpuzzle is known to significantly improve retention (Cesare et al., 2021). By integrating KoGOPEQ, the study operationalizes the theory that EQ and character are best developed through a collaborative ecosystem involving school and home (Madani et al., 2024). This theoretical framework supports the research novelty by providing a structure where the abstract nature of fractions is made accessible through technology, while the collaborative nature of KoGOPEQ ensures the social and emotional aspects of learning are reinforced. Furthermore, the concept of the learning trajectory is applied to guide the students' journey from informal understanding to formal mathematical knowledge, ensuring that character development is embedded within the cognitive process (Hardika et al., 2024)

Given the urgency of addressing the decline in student character indices and the persistent difficulties in learning mathematics, this study centers its focus on the development and validation of a specific learning innovation. Therefore, the objective of this research is to develop an interactive learning video based on the Edpuzzle platform that is oriented towards the Teacher-Parent-Student Collaboration and Emotional Quotient (KoGOPEQ) model, specifically designed to improve the independent and honest character of fourth-grade elementary school students during the learning of fraction material.

METHODS

This study employs a research and development (R&D) approach, which serves as the overarching methodology for producing a specific product and systematically testing its effectiveness. As defined by (Sugiyono, 2008), the R&D method is a process used to develop

and validate educational products through rigorous cycles of design, evaluation, and revision. This research integrates both qualitative and quantitative methods in a mixed-methods fashion. A mixed-methods approach allows researchers to combine philosophical assumptions and methods of inquiry to capitalize on the strengths of both quantitative and qualitative approaches. In this study, qualitative data were utilized to capture descriptive feedback, critiques, and suggestions during the formative evaluation stages, while quantitative data were used to measure the validity, practicality, and effectiveness of the product through numerical indices. This dual approach ensures that the developed product is not only statistically effective but also contextually relevant and user-friendly.

The research design follows the model proposed by Plomp and Nieveen, which consists of three distinct phases: (1) Preliminary Research, (2) Prototyping Phase, and (3) Assessment Phase. This design was selected over other R&D models, such as the traditional Borg & Gall model, due to its flexibility and emphasis on iterative formative evaluation, which is crucial for developing complex interactive media. Unlike experimental designs that merely test the outcome of an intervention, the Plomp model allows for continuous refinement of the prototype based on expert and user feedback before final assessment. The Preliminary Research phase involves needs analysis and literature review to establish the conceptual framework. The Prototyping Phase focuses on the iterative cycle of designing, evaluating, and revising the video. Finally, the Assessment Phase involves semi-summative evaluation to determine the product's quality and effectiveness in the actual educational context. This design is particularly appropriate for answering the research objectives as it bridges the gap between theoretical educational needs and practical media application.

The population of this study comprised fourth-grade elementary school students in the Buleleng Regency, specifically those enrolled in schools implementing the Merdeka Curriculum. The sampling technique utilized was purposive sampling. As explained by Sugiyono (2019), purposive sampling is a technique where the researcher selects samples based on specific characteristics or criteria known to possess the information needed for the research objectives. Two schools, SDN No. 1 Baktiseraga and SDN No. 6 Panji, were selected based on criteria including the diversity of student characteristics, the availability of technological infrastructure, and the established cooperation with the schools. The research subjects involved 48 fourth-grade students, divided into 34 students from SDN 1 Baktiseraga and 14 students from SDN 6 Panji. These students participated as the primary subjects for the practicality and effectiveness tests. Additionally, three experts (media and material

experts), two classroom teachers, and parents of the involved students were selected as samples for the validation and initial evaluation phases.

Data were collected using a triangulation of methods to ensure the validity and reliability of the findings. The instruments used included expert validation sheets assess product validity; practicality questionnaires employing Likert scales, similar to those used by (Sari et al., 2025); structured observation checklists to monitor character development; and objective pretest and posttest instruments. Data collection procedures were conducted in stages corresponding to the research design: observation and interviews during the preliminary phase, distribution of validation sheets during prototyping, and the simultaneous administration of questionnaires, observations, and tests during the assessment phase. For the quantitative instruments, content validity was ensured through evaluation by the selected experts to verify that the indicators for independence, honesty, and fraction understanding were observable and measurable.

Data analysis was performed using both descriptive qualitative and quantitative techniques to provide a comprehensive evaluation of the product. Qualitative data derived from open-ended questionnaire responses, interview transcripts, and expert suggestions were analyzed using the interactive model. This process involved three concurrent flows of activity: data condensation (coding and summarizing), data display (organizing the coded data into matrices or themes), and conclusion drawing or verifying. Quantitative data were analyzed descriptively and inferentially, often utilizing spreadsheet software for precision. The validity of the product was determined by calculating the average score from expert validation sheets, where a score above 3.5 (on a 5-point scale) (Hutauruk & Ritonga, 2022). Practicality was measured by calculating the percentage of positive responses using the formula. Finally, effectiveness was determined by calculating the Normalized Gain Score $(< g >)$ using the formula $< g > = \frac{(S_{\{post\}} - S_{\{pre\}})}{(S_{\{max\}} - S_{\{pre\}})}$, the resulting values interpreted using the standard criteria for low, medium, and high effectiveness.

RESULTS

This research successfully produced an interactive learning video aimed at fostering independent and honest character in fourth-grade elementary school students using the KoGOPEQ model. The study utilized a research and development (R&D) approach,

following the three main phases of the Plomp and Nieveen development model: preliminary research, prototyping, and assessment. The results at each stage are presented in detail below, supported by empirical evidence obtained from validation sheets, questionnaires, observations, and tests.

Preliminary Research Phas

During the preliminary research phase, the researcher conducted in-depth observations and interviews to understand the context and needs of the learning environment. The investigation revealed several critical issues. Firstly, there was a lack of teaching media variations that integrated mathematics learning with character education. Secondly, a decline in student learning interest was observed, alongside significant difficulties in understanding fraction material. Thirdly, the majority of students received minimal parental guidance at home because parents found it challenging to teach mathematics using only school textbooks. The researcher also examined the curriculum in use, identifying the Merdeka Curriculum with the Learning Objective Flow (ATP) aligned with Learning Outcomes (CP). The focus during this phase was on analyzing students' learning styles, motivation, academic abilities, and character prior to the introduction of the developed product. These findings served as the foundation for designing the appropriate media to meet the specific needs of the students.

Prototyping Phase and Product Validation

In the prototyping phase, the product was designed and improved iteratively through design, formative evaluation, and revision. This process resulted in Prototype II, which was deemed ready for field testing. To ensure the quality of the product, Prototype II was subjected to validation by three experts consisting of media and material experts. The validation results are summarized in Table 1.

Table 1. Summary of Learning Video Validator Results

Validator	Average Score	Category
Validator I	4.60	Very Good
Validator II	4.00	Very Good
Validator III	4.90	Very Good
Total Average	4.50	Very Good

The data in Table 1 shows that the average score from the validators was 4.50, which falls into the "Very Good" category. This empirical evidence indicates that from all measured validation aspects (content and construct), the interactive learning video developed meets high-quality standards and is declared feasible for implementation in the learning process.

Assessment Phase (Field Trials)

The assessment phase was conducted through three stages of trials: limited trials, Field Trial I, and Field Trial II. The limited trial involved 34 students and one teacher from SDN 1 Baktiseraga to assess initial practicality. Subsequent trials (Field I and II) involved students from both SDN 1 Baktiseraga and SDN 6 Panji. Data were collected to evaluate the practicality and effectiveness of the product.

Practicality Analysis

Practicality was assessed using response questionnaires distributed to students and teachers after each trial stage. The results indicate a consistent increase in practicality scores following product revisions.

Table 2. Student Response Results

No.	Trial	Percentage Score (SDN 1 Baktiseraga)	Percentage Score (SDN 6 Panji)	Average
1	Limited	69.41%	-	69.41%
2	Field I	75.13%	75.71%	75.42%
3	Field II	81.01%	80.00%	80.50%

Table 3. Educator Response Results

No	Trial	Percentage Score (SDN 1 Baktiseraga)	Percentage Score (SDN 6 Panji)	Average
1	Limited	68.33%	-	68.33%
2	Field I	76.67%	80.00%	78.34%
3	Field II	86.67%	86.67%	86.67%

Tables 2 and 3 demonstrate that the percentage of practicality increased from the limited trial to Field Trial II. In the final stage, the student response average reached 80.50% and the teacher response average reached 86.67%, both categorized as "Very Practical." The initial lower scores during the limited trial were attributed to students being unfamiliar with

the interactive video medium; however, after revisions and habituation, the media proved to be highly practical and easy to use.

Effectiveness Analysis: Character Development

The effectiveness of the video in improving character was measured through observation sheets analyzed using gain scores. The analysis focused on two character traits: independence and honesty.

1. Independent Character

The observation of independent character included indicators such as completing tasks without help, study habits, seeking information, and paying attention.

Table 4. Recapitulation of Analysis of the Increase in Students' Independent Character

Stage	Average at SDN 1 Baktiseraga	Average at SDN 6 Panji	Overall Average	Category
Field Trial I	0.39	0.30	0.35	Medium
Field Trial II	0.78	0.81	0.80	High

As shown in Table 4, the gain score for independent character increased from 0.35 (Medium) in Field Trial I to 0.80 (High) in Field Trial II. This indicates a significant positive development in students' ability to work independently after using the KoGOPEQ-oriented video.

2. Honest Character

The observation of honest character included indicators such as admitting mistakes, apologizing, and not cheating.

Table 5. Recapitulation of Analysis of the Increase in Students' Honest Character

Stage	Average at SDN 1 Baktiseraga	Average at SDN 6 Panji	Overall Average	Category
Field Trial I	0.32	0.40	0.36	Medium
Field Trial II	0.78	0.76	0.77	High

Table 5 reveals a similar trend, with the gain score for honest character rising from 0.36 (Medium) in Field Trial I to 0.77 (High) in Field Trial II. These results confirm that the learning video is effective in cultivating honest behavior among students.

Effectiveness Analysis: Cognitive Understanding

Cognitive effectiveness was evaluated by comparing pretest and posttest scores regarding the understanding of fraction concepts.

Table 6. Recapitulation of Pretest and Posttest Results of Students

No.	School	Total Score (Pre/Post)	Average Score (Pre/Post)	Gain Score	Category
1	SDN 1 Baktiseraga	Pre: 1432 Post: 2460	42.12 72.35	0.47	Medium
2	SDN 6 Panji	Pre: 580 Post: 1008	41.43 72.00	0.59	Medium

The data in Table 6 indicate an improvement in mathematical understanding at both schools. SDN 1 Baktiseraga saw an increase of 30.23 points, and SDN 6 Panji saw an increase of 30.57 points. The gain scores of 0.47 and 0.59, categorized as "Medium," further support the conclusion that the video contributes to improved conceptual understanding of fractions alongside character development.

Conclusion of Results

Based on the empirical evidence gathered across all research phases, it can be concluded that the interactive learning video oriented to the KoGOPEQ model successfully meets the criteria of being valid, practical, and effective. The product not only facilitates a better understanding of fraction material but also plays a significant role in enhancing the independent and honest character of fourth-grade elementary students.

DISCUSSION

Analysis of Research Results

The findings of this study reveal that the interactive learning video developed using the KoGOPEQ model is not only valid but also highly practical and effective in achieving its educational goals. The high validity score (4.50) reflects the success of the multi-platform integration strategy employed. By combining Edpuzzle as the primary delivery platform for interactivity, Canva for aesthetic visual design, and Filmora 11 for dynamic animation and audio, the product successfully addressed the abstract nature of fraction material. This integration allowed for a multi-sensory learning experience where seeing, hearing, and doing

were synchronized, thereby facilitating better cognitive retention and character internalization

The significant increase in practicality scores from the limited trial to Field Trial II, reaching over 80% for both students and teachers, indicates that while the initial use of the technology posed a minor hurdle (likely due to unfamiliarity), the media is highly usable once adopted. The inclusion of specific guides for parents and students within the video interface appears to have been a crucial factor in this practicality, empowering parents to assist their children effectively despite previous limitations in pedagogical knowledge.

Furthermore, the effectiveness analysis demonstrated that the video significantly improved both character traits and cognitive understanding. The high gain scores for independence (0.80) and honesty (0.77) suggest that the explicit integration of Emotional Quotient (EQ) content and character scenarios within the math video successfully fostered these virtues. This improvement is structurally supported by the learning trajectory implemented in the video, which guided students from an Informal stage (real-world problems) through the Model of and Model For stages (visual representations), finally arriving at Formal Knowledge. This structured progression ensured that character values, such as admitting mistakes (honesty) and solving problems without help (independence), were practiced concurrently with mathematical operations.

Comparison with Previous Studies

The results of this study are consistent with prior research emphasizing the efficacy of interactive video in increasing student engagement and understanding. Similar to findings by (Qadriani et al., 2021) and (Shafa & Yunianta, 2022), this study confirms that interactive features prevent students from being passive recipients of information. Furthermore, the study aligns with Salmiati (2021) regarding the positive impact of collaboration on learning quality. However, this research distinguishes itself from previous studies by filling a specific gap. While earlier research often focused on either cognitive outcomes or character development in isolation, or utilized technology without a structured collaborative framework, this study successfully combined the KoGOPEQ model (involving teachers, parents, and students) with interactive technology. The result is a more holistic intervention that addresses the "home" gap in learning identified by Cahyati & Kusumah(2020), demonstrating that when parents are given a structured role through technology, student character and academic outcomes improve synergistically.

Implications of Findings

Theoretically, this research contributes to the field of instructional design by validating the KoGOPEQ model as an effective framework for digital learning environments. It expands the theory of multimedia learning by showing that character education is not an add-on but can be seamlessly woven into the fabric of academic content delivery through digital storytelling and interactive quizzing.

Practically, the findings imply that schools and educators should move beyond traditional teaching methods and adopt collaborative digital tools. The study highlights that providing mere content is insufficient; providing a mechanism for parental involvement and emotional guidance is equally critical. Consequently, there is a need for professional development programs that train teachers not only on how to use software like Edpuzzle and Filmora but also on how to facilitate the tri-party collaboration inherent in the KoGOPEQ model. The "parent guide" feature developed in this video serves as a prototype for how educational technology can bridge the gap between classroom instruction and home reinforcement.

Research Limitations

Despite the positive outcomes, this study acknowledges several limitations. First, the scope of character development was limited to two specific traits: independence and honesty. Other essential character dimensions, such as discipline, empathy, and responsibility, were not explored in depth. Second, the study was conducted in only two elementary schools with a specific sample size of 48 students. While the results are encouraging, the generalizability of the findings to different regions, school types, or age groups requires caution. Third, the research focused primarily on the implementation phase; a longitudinal study was not conducted to determine if the improvements in character and mathematical understanding are sustained over a longer period after the intervention ceases.

CONCLUSION

Synthesis of Findings

This study successfully developed and validated an interactive learning video oriented towards the KoGOPEQ (Teacher-Parent-Student Collaboration and Emotional Quotient) model for fraction material. The research objectives were met, as evidenced by the product

achieving a "Very Valid" category (score 4.50), a "Very Practical" category (average score >80%), and a "Highly Effective" category. The empirical data clearly indicates that the intervention significantly enhanced the independent and honest character of fourth-grade students, with gain scores of 0.80 and 0.77, respectively, while also improving their cognitive understanding of fractions (gain score 0.47–0.59). The integration of parental guidance and EQ-focused content within the video platform proved to be a key differentiator in achieving these results.

Scientific Contribution

The scientific contribution of this study is twofold. Theoretically, it offers a novel framework that synthesizes collaborative learning models with interactive multimedia, providing evidence that character education can be effectively digitalized without compromising academic rigor. It extends the discourse on the "Learning Trajectory" by demonstrating how character values can be embedded into the stages of mathematical concept acquisition. Methodologically and practically, the study produces a tangible, replicable prototype (the KoGOPEQ video) which addresses a critical gap in the literature regarding the role of parents in technology-mediated learning. It offers a solution for educators striving to implement the Pancasila student profile within the Merdeka Curriculum context.

Recommendations for Future Research

Based on the limitations identified, future research is recommended to expand the scope of character traits integrated into learning videos, such as discipline, empathy, and tolerance, to provide a more comprehensive character education model. Additionally, subsequent studies should involve a larger and more diverse sample of schools from various regions to enhance the generalizability of the findings. Finally, longitudinal research is suggested to monitor the long-term retention of mathematical concepts and the sustainability of character development in students after the use of the KoGOPEQ video has been discontinued.

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