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The Effectiveness of Hypercontent-Based Character Learning for Elementary School Children

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Abstract

The purpose of this study is to examine how effective hypercontent-based character learning is for elementary school children. The method used in this research is research and development (R&D) adapting the Hannafin and Peck model with a quantitative approach. The product developed is a hypercontent-based electronic textbook containing audio, video, links, images, and QR codes accessible via smartphones and computers. The research subjects were 35 first-grade students at SD Negeri 2 Selakau Tua, Sambas Regency, West Kalimantan. Pre-test and post-test instruments were employed to gather the data. Expert validation produced average scores of 3.14 (material expert), 3.02 (instructional design expert), and 2.93 (media expert). Field trial results showed a pre-test average of 73.31 rising to 83.00 on the post-test. The Paired T-test yielded p-value = 0.000 < 0.05. It is concluded that hypercontent-based character learning effectively improves integrity character education learning outcomes among first-grade elementary school students.

Keywords: effectiveness, character education, hypercontent, elementary school, electronic textbook

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INTRODUCTION

Education in the 21st century faces increasingly complex challenges across all levels of schooling. National education is anticipated to the caliber of human resources who are both knowledgeable and morally upright (Abidin, 2012). Character formation and development cannot be achieved through classroom theory alone; it must be practiced in daily life through learning activities integrated within the school curriculum.

The weakening of national character as evidenced by widespread corruption cases, dishonesty, and misuse of information technology has become a serious concern for Indonesian education. Data from the Corruption Eradication Commission (KPK) revealed that hundreds of regional officials were implicated in corruption cases between 2014 and 2019, indicating a weak foundation of character education from an early age (Abidin, 2012). Consequently, instilling integrity values beginning at the elementary school level has become critically important (Ministry of Education and Culture of Indonesia (Kemendikbud, 2017).

Today's students are born into the era of Generation Z and are highly familiar with digital technology. A 2017 survey by the Ministry of Communication and Information Technology (Kominfo) showed that 40.87% of elementary school children already own a smartphone, while Statistics Indonesia (BPS, 2019) reported that 7.93% of children aged 5-12 years have internet access. This is aligned with the view of Amponsah et al. (2019) that learning is guided by purpose and is connected to meaningful experience, making digital media a highly relevant learning medium for this generation.

Since 2016, the Indonesian government, through the Ministry of Education and Culture, has launched the Character Education Strengthening (Penguatan Pendidikan Karakter/PPK) movement, establishing character education as the foundation of national education (Kemendikbud, 2017). At the elementary school level, 70 percent of the learning process is devoted to character development. The five priority character values are religious, nationalist, integrity, independent, and cooperative spirit. However, implementation remains challenged: teachers typically embed character values implicitly without dedicated instructional materials, teaching strategies remain conventional, and appropriate learning media are lacking.

Hypercontent refers to a concept of instructional material that integrates various multimedia elements text, audio, video, images, hyperlinks, and QR codes within a single digital platform accessible anytime and anywhere. Media utilization in the learning process has demonstrated its effectiveness in enhancing student learning outcomes (Orey et al., 2013), facilitate self-directed learning (Rufii, 2015), and promote active learner engagement (Bada & Olusegun, 2015). Developing hypercontent-based instructional materials for character education is therefore an innovative approach that is particularly pertinent to the demands of the contemporary digital generation.

This study focuses on the development and effectiveness testing of hypercontent-based character learning materials for first-grade elementary school students, incorporating the integrity character values of honesty, responsibility, justice, exemplary conduct, and anti-corruption.

THEORETICAL FRAMEWORK

Character Education in Elementary Schools

Character education represents an intentional and structured endeavor to cultivate positive values within students through purposeful learning experiences. Character is not innate but is shaped by the school, family, and social environment (Wiyani, 2013). In Indonesia, character education is grounded in religious values, Pancasila (the state ideology), culture, and national educational goals (Kemendikbud, 2017).

Piaget's developmental theory, as cited by Santrock (2004), explains that children at the elementary school level are situated in the concrete operational stage, where they begin to view the world objectively and think operationally. This stage is highly strategic for embedding character materials within learning activities to shape positive personality traits. A person is considered to have good character when they demonstrate all three dimensions: moral knowledge, moral feeling, and

moral action. Indonesia is currently experiencing a moral crisis that reflects an increasingly weakened system of character education (Abidin, 2012).

The integrity character value is one of the five priority values established by the government: a commitment to consistently demonstrating reliability and integrity in one's words, actions, and responsibilities; who has commitment to humanitarian and moral values; and who actively participates in social life (Kemendikbud, 2017). Effective character education models are those that employ a comprehensive approach integrated across various subject areas (Zuchdi et al., 2010).

Hypercontent-Based Instructional Materials

Instructional materials encompass any form of content designed to support teachers in facilitating learning, comprising knowledge, skills, and attitudes that are arranged in a structured and coherent manner (Andani & Yulian, 2018). Instructional materials ought to embody the qualities of being self-instructional, self-contained, stand-alone, adaptive, and user-friendly, allowing students to engage in autonomous learning (Sasmita & Fajriyah, 2019).

The development of CD interactive-based learning materials has been shown to improve elementary student learning outcomes, with expert validation reaching 87.2% (Warkintin & Mulyadi, 2019). E-modules have been found suitable for individualized learning, facilitating learner independence and improving performance (Rufii, 2015). Alias and Siraj (2012) confirmed that e-modules are effective for learning regardless of gender. Furthermore, Logan et al. (2020) revealed that e-learning modules empower students to participate more actively in their personal learning journey.

Hypercontent extends the concept of hypertext and hypermedia by combining multiple types of multimedia content within a single interconnected platform. Web-based learning provides materials that support self-directed study, and independent learning based on instructional materials can be enhanced through hypercontent (Jarudin et al., 2020). According to Kim and Gilman (2008), the use of visual and audio media supports knowledge acquisition and improves achievement scores, as it allows learners to visualize concepts in more meaningful ways.

Kim and Thayne (2015) emphasize that most online instruction today makes use of media as a primary or supplementary mode of learning delivery. The use of media in distance learning offers cost efficiency, practicality, standardization, and the development of learning individuality. Digital media has also been proven effective in improving learning outcomes and student motivation (Rohman et al., 2020).

The Hannafin and Peck Development Model

The Hannafin and Peck (1998) development model was selected because it is product-oriented, making it suitable for producing media-based instructional materials. The model consists of three phases: (1) needs assessment; (2) design; and (3) develop and implement. Each phase incorporates evaluation and revision to ensure product quality. This model aligns with the view of Branch (2002) that

instructional models serve to simplify real-world complexity into general steps applicable across various contexts.

Instructional design constitutes a systematic and intentional process that supports the thoughtful development of knowledge, skills, and attitudes (Gogineni et al., 2018). In this regard, the model functions as a framework and reference point for educators in constructing learning systems that are both effective and measurable (Dousay, 2015). Instructional design development that aligns with learner characteristics has been shown to produce more meaningful learning experiences (Triyono, 2014).

Underlying Learning Theories

The development of hypercontent-based instructional materials is grounded in several learning theories. Behaviorist theory emphasizes the importance of stimulus-response relationships and reinforcement in shaping behavior (Budiningsih, 2004). Constructivist theory asserts that learners actively build knowledge through meaningful experience (Bada & Olusegun, 2015). Gagne's learning theory explains that behavioral change depends on two factors: internal factors (the learner themselves) and external factors, including technology as a learning support tool (Gagne et al., 2005).

Reigeluth (2009) argues that prescriptive learning theory is oriented toward achieving goals through optimal methods. Dick et al. (2015) explain that a systematic instructional strategy encompassing pre-instructional activities, content presentation, learner participation, assessment, and follow-up activities is the key to achieving learning objectives.

METHODS

This study employed a research and development (R&D) approach as introduced by Borg and Gall, adapting the Hannafin and Peck (1998) development model with a quantitative orientation. Each stage was implemented systematically in accordance with the chosen development model (Sugiyono, 2016). The study was conducted at SD Negeri 2 Selakau Tua, Selakau District, Sambas Regency, West Kalimantan, during the second semester of the 2019/2020 academic year.

Research Subjects

Research subjects consisted of: (1) three expert validators a material expert, an instructional design expert, and a media expert; (2) three first-grade students for one-to-one trials; (3) eight first-grade students for small group trials; and (4) 35 first-grade students of SD Negeri 2 Selakau Tua for the field trial.

Development Procedure

The development procedure followed the three phases of the Hannafin and Peck (1998) model. First, the needs assessment phase was conducted through observation, interviews with teachers and the school principal, and analysis of existing learning conditions. Second, the design phase included the formulation of general and specific learning objectives, instructional analysis, identification of

student characteristics, development of criterion-referenced tests, and instructional strategy design. Third, the develop and implement phase encompassed the creation of the hypercontent-based electronic textbook, expert validation, and staged product trials.

Instruments and Data Analysis

Instruments used included: (1) evaluation sheets for expert validation material expert (26 items), instructional design expert (29 items), and media expert (45 items) using a 4-point Likert scale (Sugiyono, 2016); (2) a student integrity attitude questionnaire; and (3) pre-test and post-test consisting of 10 items. A product was deemed feasible if it obtained a minimum average score of 3.00. Effectiveness was assessed using the Paired T-test via SPSS, preceded by a Kolmogorov-Smirnov normality test.

RESULTS & DISCUSSION

Needs Analysis

Observations and interviews at SD Negeri 2 Selakau Tua revealed several fundamental problems: highly limited learning support facilities (only a blackboard available), no digital learning media, inadequate internet connectivity, and no dedicated character education textbook. The predominant teaching strategy was lecture-based and conventional. This outcome aligns with the results reported by Goksu et al. (2017) that many schools have not yet optimized technology-based instructional design models in their teaching practice.

Interviews with teachers and the school principal confirmed the need for learning media that is easy to use, effective, and accessible from anywhere. Students also struggled to learn independently without teacher guidance. These findings reinforce the urgency of developing hypercontent-based instructional materials that are self-instructional and adaptive (Sasmita & Fajriyah, 2019).

Product Development

The product developed is a hypercontent-based electronic textbook comprising two sub-themes: (1) Sub-theme 1 'Me and My New Friends,' covering self-introduction, recognizing peers' cultural backgrounds, counting, writing letters and numbers, recognizing shapes, and reading aloud; and (2) Sub-theme 2 'My Body,' covering body part recognition, bodily functions, body care, and hygiene tools. All materials are integrated with integrity character values.

The product is packaged in an application accessible via smartphones (Android minimum Jelly Bean, 512 MB RAM) and computers, available in both online and offline modes. Hypercontent components include text, images, audio narration, instructional videos, hyperlinks, and QR codes connecting to supplementary learning resources. This aligns with Nicholson (2007)'s recommendation that e-modules make learning effective, independent, and progressive, and with Lewis-Pierre and Aziza (2017) who found that learning media applications effectively facilitate interactive distance learning.

Product Feasibility Results

Validation by subject matter experts was carried out involving three validators, with the findings summarized in Table 1.

Table 1. Expert Validation Results

Validator	Component	Mean Score	Category
Material Expert	Learning Objectives	3.00	Feasible
	Content	3.29	Very Feasible
	Learning Process	3.36	Very Feasible
	Evaluation	3.00	Feasible
	Overall	3.14	Very Feasible
Instructional Design Expert	Learning Objectives	3.00	Feasible
	Learning Process	3.05	Very Feasible
	Evaluation	3.00	Feasible
	Overall	3.02	Feasible
Media Expert	Learning Objectives	3.50	Very Feasible
	Program Adequacy	3.14	Very Feasible
	Design Adequacy	2.80	Adequately Feasible
	Learning Process	2.87	Adequately Feasible
	Evaluation Form	2.50	Adequately Feasible
	Formative Evaluation	2.75	Adequately Feasible
	Overall	2.93	Adequately Feasible

As presented in Table 1, the material expert awarded a cumulative average score of 3.14 (very feasible). The instructional design expert gave a score of 3.02 (feasible), while the media expert gave 2.93 (adequately feasible). These results indicate that the product met the minimum feasibility criterion (score >= 3.00) according to two out of three validators. Suggestions from the experts including the addition of a concept map, learning objectives, final evaluation, glossary, and teacher's guide were all incorporated in the product revision.

Product Trial Results

The one-to-one trial involved three students with varying ability levels. This trial test results showed an average score of 80.67, classified as effective. Students responded positively, indicating that the materials were easy to understand and that they appreciated having a practical learning guide accessible at any time. This finding is consistent with Lewis (2013) who found that instructional media can improve student competence, and with Waiyakoon et al. (2015) who demonstrated

that media not only produces learning effects but also enhances students' capacity for independent learning.

The small group trial involved eight students over two months and yielded an average score of 80.63, also categorized as effective. Most students experienced no difficulty understanding the content, rated the material as very clear and engaging, and stated that the learning materials supported self-directed study. As noted by Carson et al. (2018), digital media has proven effective in enhancing student learning outcomes and student competencies. One notable observation was students' dependence on internet data quotas and signal availability to access online content.

Effectiveness Test Results (Field Trial)

The field trial involved 35 first-grade students at SD Negeri 2 Selakau Tua. Pre-test and post-test results are presented in Table 2.

Table 2. Pre-test and Post-test Results of Field Trial

Measurement	Mean	Std. Deviation	N
Pre-test	73.31	6.77	35
Post-test	83.00	4.33	35
Gain	+9.69	-	-

The normality test using the One-Sample Kolmogorov-Smirnov showed a Sig. value of 0.154 > 0.05, indicating that the data were normally distributed (Sugiyono, 2016). The Paired T-test was then conducted using SPSS, with results presented in Table 3.

Table 3. Paired T-test Results

Pair	Mean	Std. Dev.	df	Sig. (2-tailed)
Pre-test - Post-test	-9.6857	3.367	34	0.000

As shown in Table 3, the obtained p-value of 0.000, which falls below the 0.05 threshold, confirms a statistically meaningful distinction between scores obtained prior to and following the intervention. The negative mean value (-9.6857) reflects a positive upward trend in post-test scores. The average increase of 9.69 points demonstrates that the hypercontent-based electronic textbook is effective in enhancing integrity character education learning outcomes among first-grade elementary school students.

Discussion

These findings reinforce prior research on the effectiveness of technology-based instructional media. Orey et al. (2013) found that interactive media renders the learning process both effective and progressively developmental. Lewis-Pierre and Aziza (2017) found that learning media applications effectively facilitate interactive distance learning. Rusmono et al. (2020) demonstrated that digital media simplifies independent learning and is effective in improving learning outcomes.

The effectiveness of hypercontent-based instructional materials in this study can be explained through several mechanisms. First, the multimedia learning principle holds that learning is more effective when information is presented through both words and images simultaneously (Fiorella & Mayer, 2018). Second, the accessibility principle enables students to learn anytime and anywhere, supporting self-directed learning (Rufii, 2015). Third, the interactivity principle promotes active learner engagement (Bada & Olusegun, 2015). Fourth, the content aligns with the characteristics of Generation Z students who prefer technology-based learning (Kemendikbud, 2017).

In the regard of character education, the integration of integrity values into hypercontent proved effective because: (1) video demonstrations of role models strengthened behavioral modeling in accordance with social learning theory (Gagne et al., 2005); (2) audio narrations of exemplary stories reinforced the affective dimension; (3) interactive exercises encouraged the practice and habituation of character values consistent with behaviorist principles (Budiningsih, 2004); and (4) smartphone accessibility enabled character reinforcement beyond school hours under parental supervision. Bajrami and Ismaili (2016) confirm that the use of appropriate video media ensures student-centeredness and encourages active participation in learning activities.

The results of this study are also consistent with the findings of Jarudin et al. (2020), who developed hyperlink-based media for skill learning, in which hypermedia-based media proved effective in instructional delivery. Furthermore, Goksu et al. (2017) found in their content analysis of instructional design model research that product-oriented models incorporating formative evaluation components yield higher-quality products.

Despite these positive findings, several limitations were identified. Dependence on internet connectivity and device availability presents a barrier for students in areas with underdeveloped digital infrastructure, a challenge also noted by Nicholson (2007) regarding e-learning implementation difficulties in various contexts. Additionally, the use of hypercontent learning materials by first-grade elementary students requires intensive guidance from teachers and parents, consistent with Vogel-Walcutt et al. (2013)'s recommendation that instructional strategies must account for learners' capabilities and level of independence.

CONCLUSION

The findings of this study yield three principal conclusions. First, the hypercontent-based character learning materials developed using the Hannafin and Peck model met the established feasibility criteria: the material expert assigned a score of 3.14 (very feasible), the instructional design expert 3.02 (feasible), and the media expert 2.93 (adequately feasible).

Second, the hypercontent-based character learning materials proved effective in improving integrity character education learning outcomes among first-grade elementary school students, as evidenced by an increase in the average score from a pre-test of 73.31 to a post-test of 83.00, with p-value = 0.000 < 0.05 on the

Paired T-test. This result corroborates previous research that has established the efficacy of digital media within educational contexts.

Third, hypercontent-based instructional materials hold great potential as an innovative approach to character education in the digital era, given the technology-oriented characteristics of Generation Z learners. However, effective implementation requires adequate internet infrastructure, intensive guidance from teachers and parents, and the provision of supplementary videos to clarify difficult material. Subsequent studies are encouraged to investigate the applicability and effectiveness of comparable materials across varying grade levels, with a broader range of character values, while also taking into account digital infrastructure conditions and parental involvement.

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