Development of Gamification-Based Digital Educational Game in Civic Education Learning on Rights and Obligations at Grade III Elementary Students

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Pengembangan Game Edukasi Digital Berbasis Gamifikasi Pada Pembelajaran Ppkn Materi Kewajiban dan Hak Siswa Kelas III Sekolah Dasar

ARTICLE HISTORY	ABSTRACT
	Abstract: *Students have a lot of developments rapidly ranging from language, emotions, and social at the elementary school level. This rapid development requires a teacher to be creative and active to optimize the students' skills. The elementary students' characteristics are happy learning through playing. Along with the development of advanced technology that grows rapidly, the researchers conducted research to produce gamification-based digital educational game products on Civic Education learning on rights and obligations learning material at grade III elementary students. The developed digital educational game utilizes gamification elements. The research method used was the research and development method with the ADDIE model from Cennamo, Abell, and Chung. The results of the expert validation test on this digital educational game get an average percentage score of 85.16%, which is in the very good category. The user trial results get a percentage of 100% from the group test and 99.3% from the field test in the very good category. Therefore, the gamification-based digital educational game product is suitable as media for Civic Education in the learning material of rights and obligations for grade III elementary students.* ***Keywords:*** *digital educational games, gamification, civic education*
	Abstrak: Peserta didik mengalami berbagai perkembangan yang sangat pesat mulai dari bahasa, emosi, dan sosial di usia sekolah dasar. Perkembangan yang pesat ini menuntut seorang guru untuk kreatif dan aktif untuk mengoptimalkan seluruh kemampuan peserta didik. Karakteristik siswa sekolah dasar adalah senang belajar sambil bermain. Seiring dengan berkembangnya teknologi yang semakin maju, peneliti melakukan penelitian untuk menghasilkan produk *game* edukasi digital berbasis gamifikasi pada pembelajaran PPKn materi kewajiban dan hak di kelas III sekolah dasar. *Game* edukasi digital yang dikembangkan memanfaatkan unsur gamifikasi. Metode penelitian yang digunakan adalah metode penelitian dan pengembangan dengan model ADDIE dari Cennamo, Abell, dan Chung. Hasil uji validasi ahli terhadap *game* edukasi digital ini mendapatkan persentase skor rata-rata sebesar 85,16% yang termasuk dalam kategori sangat baik. Hasil uji coba pengguna mendapatkan persentase 100% dari uji kelompok dan 99,3% dari uji lapangan yang termasuk kategori sangat baik. Oleh karena itu, produk *game* edukasi digital berbasis gamifikasi ini layak digunakan sebagai media pembelajaran PPKn pada materi kewajiban dan hak untuk kelas III SD. **Kata Kunci:** *game edukasi digital, gamifikasi, pembelajaran PPKn*

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INTRODUCTION

Elementary schools is the first level of formal education that is required to be attended by students who are living in Indonesia. Primary education lasts six years, starting from 6 to 12 (Magdalena, Akbar, Situmorang, & Rosnaningsih, 2019). Children's language, emotional, and social development are some aspects that develop rapidly in primary school (Dewi, Neviyarni, & Irdamurni, 2020). This rapid development requires a teacher to be creative and active to optimize all students' abilities. As a facilitator and motivator, a teacher can include play activities in learning to increase the attractiveness and enthusiasm of students for learning. Play and learning are inseparable in the elementary schools.

Related to the characteristics of elementary school learners who enjoy studying while playing and with the advanced technology's progress, teachers can use digital learning media that incorporates gamification. Gamification involves incorporating game methods into non-game contexts to identify solutions to problems (Sambung, Sihkabuden, & Ulfa, 2017). One example of digital learning media that incorporates gamification is digital educational games, designed with both learning objectives and entertainment value in mind. These games can be played for fun while imparting knowledge (Diningsih & Wardani, 2021). Digital educational games use digital devices, such as smartphones and tablets, to operate.

Students are not wasting their time when they play digital educational games. Yulianti and Ekohariadi found that well-designed games can provide exercises for children to think about something (Yulianti & Ekohariadi, 2020). Setiawan et al. also found that educational games have a positive effect (Setiawan, Praherdhiono, & Suthoni, 2019). Educational game increase motivation and creativity in the learning environment. Playing digital educational games provides several benefits to students, such as improving thinking skills, fostering creativity, creating motivation to learn, and providing entertainment. Furthermore, digital educational games can foster a positive and enjoyable learning process.

There are several lessons in elementary school, one of which is the content of Pancasila and Citizenship Education (Civics). Civics is a learning content related to values, morals, nationality, and statehood. Civic learning in elementary schools plays an important role in shaping students' character. Implementing Civics learning as content that must be learned starting from the elementary school level is one way to build students' character to become moral people and be responsible for their duties and obligations. Teacher delivery, accompanied by the use of interesting media, can facilitate students' understanding of the material so that students become aware of acting according to their obligations and rights. The obligations and rights of learners should be carried out in a balanced manner to create a harmonious and respectful social life at school. In addition, from the cognitive side, students have insight into the material of obligations and rights at school. Therefore, learning Civics, especially the material on obligations and rights in school, is very important for students to learn.

Based on the results of interviews with third-grade teachers at SDN Kenari 08, it is known that there are obstacles to Civics learning. Civics learning is considered too theoretical, so teachers are constrained in how to deliver material. Learning becomes less interactive. Students become bored and reluctant to listen to learning materials. When given assignments, some students' answers need to be more appropriate. This is caused by learning media that tend to be less varied. The data is supported by the results of a questionnaire distributed via Google Form to third-grade students of SDN Kenari 08, which obtained information that students are interested in learning Civics. However, some students admitted that they still had difficulty understanding Civics learning. Most students complain of difficulties in the material of obligations and rights at school. As a result of not understanding the material on obligations and rights at school, students have not carried out their obligations and rights at school in a balanced manner. This can be seen in students' behavior, such as those who are still late

for class, ignore the teacher's explanation, and do not submit assignments on time. Meanwhile, students have received their rights at school, such as getting lessons and being allowed to ask questions and have opinions during learning.

Therefore, based on the existing problems gave birth to problem-solving ideas and innovations for researchers to overcome these problems. One solution to support students in understanding learning materials is to utilize digital products currently widely used, namely digital educational games. Ahsani Diningsih and Naniek Sulistya Wardani have conducted previous research with results showing that educational games are feasible to achieve learning completeness (Diningsih & Wardani, 2021). There is relevance to the research conducted by researchers; namely, both develop educational games that can be played digitally on Android devices for grade III elementary schools. However, there are differences in innovations made by researchers from previous studies, namely researchers developing digital educational games specifically on the material of obligations and rights at school. In addition, the digital educational games that researchers develop utilize gamification elements such as points, time, rewards, and feedback.

Furthermore, there is research conducted by Faisal Reza Pradhana, Triana Harmini, and Muhammad Naufal, who developed an Android-based daily prayer educational game by applying the gamification method and received very satisfied results from users because it was able to increase user interest in learning daily prayers, especially for Al-Quran Education Park (TPA) students in the pandemic era (Pradhana, Harmini, & Naufal, 2021). However, in the development of educational games conducted by researchers with research conducted by Faisal Reza Pradhana et al., there are differences in the research subject. Faisal Reza Pradhana et al. developed educational games for TPA students. Meanwhile, researchers developed digital educational games using gamification elements focusing on grade III elementary school students. In addition, there are other differences with digital educational games that researchers develop in the form of learning materials for obligations and rights at school.

Based on the problems and solutions described above, the researcher intends to develop a study entitled "Development Of A Gamification-Based Digital Educational Game In Civics Learning On Obligations And Rights In Class III Elementary Schools". This research focuses on two questions: 1) How to develop digital educational games on Civics learning material on obligations and rights at school for grade III elementary school students? 2) Is the digital educational game developed suitable for use as a learning medium in grade III elementary school? This research uses Research and Development (R&D) to answer the questions.

THEORITICAL STUDIES
Digital Educational Games

According to Asyrofi and Pransiska, educational games are games with educational factors obtained from the game itself and have become a unity (Asyrofi & Pransiska, 2021). Wibawanto supports this statement that educational games have learning content to improve the player's ability to learn a material (Wibawanto, 2020). According to Muhajarah and Rachmawati, educational games are games or fun activities containing educational content, and their use is necessary (Muhajarah & Rachmawati, 2019). There are various kinds of educational game development, including digital educational games. Digital educational games are educational games that can be played using electronic devices (Whitton, 2014). Electronic devices are facilities and infrastructure used to access digital educational games, namely cell phones or tablets.

Based on the experts' opinions described above, digital educational games are educational games that can be accessed through electronic devices such as cell phones or tablets and are entertaining to motivate learning students. Digital educational games are designed so that students can

easily understand the material so that the learning objectives can be achieved. In addition to easily understanding the learning material, students will feel happy or entertained when playing digital educational games.

Gamification

According to Kapp in the book Intania and Friends, gamification in the context of learning and instruction uses game-based mechanics, aesthetics, and game thinking to engage, motivate, and promote learning for problem-solving (Harismayanti, Putra, & Santosa, 2020). A gamification is an approach used to transform learning concepts into game mechanics-based activities with a fun atmosphere. Gamification for education concerns learning objectives, user game experience, positive learning experience, and game mechanics and rules (Romero, 2020). Ramli and Yatim explained that several gamification elements, such as marking, bookmarks, timers, rewards, and feedback, can be used for gamification implementation (Ramli & Yatim, 2021). While there are various applications of game design and the use of elements in learning content, the mechanisms most commonly found in gamification approaches with an educational context are points, leaderboards, time, rewards, and feedback.

The use of gamification elements in digital educational games does not have a minimum standard. However, it is adjusted to the development of games circulating in society, technological advances, and analysis of the learners' needs (Ariani, 2020). Based on the above description of gamification, it can be synthesized that gamification elements that can be implemented in digital educational games are points, leaderboards, timing, rewards, and feedback. However, the gamification elements still need to be adjusted to the analysis of the needs of learners and public interest in game development and technology that is developing in society so that there is no minimum standard for using elements. This means that you can use some or all of the gamification elements.

Civics Learning on Obligations and Rights at School

Maulana Arifat Lubis states that Civics is a subject content given to students within the scope of formal education to develop attitudes and morals so that students have a good personality by the noble values of the foundation of the Indonesian state, namely Pancasila (Lubis, 2020). Meanwhile, Prastowo explained that Civics learning at the elementary school level is intended as a process for students to be able to learn to become good and comprehensive citizens in the formation of the nation's personality, which leads to the realization of community life that combines democracy in the nation and state based on Pancasila, the 1945 Constitution, and applicable norms taken for six years (Prastowo, 2019).

Civics learning is an arena for instilling national identity starting from grades 1-6 at the elementary school level. By taking Civics learning, it is hoped that a civilized and moral personality will be formed in students, manifested in their everyday behavior. One of the manifestations is reflected in the implementation of the obligations and rights of students. Rights and obligations are interrelated. Ideally, they should be carried out in a balanced manner (Prasetia, Muhari, & Subroto, 2019). At the elementary school level, mastering the concept of obligations and rights has an important role, including understanding the obligations and rights of students at school. If obligations and rights are not carried out in a balanced manner, it will make learners insecure about their duties and responsibilities at school. Therefore, students need to learn the material of obligations and rights at school, which is included in Civics learning.

RESEARCH METHODS

This research uses the research and development (R&D) method. Research and development is a stage to develop a new product or revise and improve existing products (Salim & Haidir, 2019). This research and development uses the ADDIE development model (Analyze, Design, Development, Implementation, Evaluation). The ADDIE development model describes a systematic approach to development in education (Purnamasari, 2019). The stages of the ADDIE development model in this research and development are the stages of Cennamo, Abell, and Chung (1996), adapted by Yudi Hari Rayanto and Sugianti. This development model was chosen because each stage discusses detailed and focused activities, especially at the development and implementation stages.

Figure 1. Stage of the ADDIE Development Model (Rayanto & Sugianti, 2020)

First, the analysis stage is collecting data and information in the field. Second is the design stage. At this stage, the researcher designs based on the research and determines the learning environment. Researchers must determine the location, respondents to be tested, and expert review. Third is the development stage, in which the researcher develops the design that has been made. This activity produces a physical product that was previously only a design. Fourth is the implementation stage, in which the products made must be assessed for success and validity at several stages, including expert, group, and field tests. Fifth is the evaluation stage, which is the stage for conducting evaluations to confirm expert testing results and obtaining feasibility results by students during the user test.

This development research was conducted from March to July 2023 at SDN Kenari 08, Central Jakarta. The subjects of this research were 10 group test students and 31 field test students in grade III. The data collection techniques used were teacher-needs-analysis interviews, learner-needs-analysis questionnaires, expert validation instruments (media experts, material experts, and linguists) to test media feasibility, and user trial questionnaires. The data analysis technique used in this research is quantitative descriptive statistics. Descriptive statistics is one of the statistical methods for collecting and presenting information to make it easier for readers to use the data (Martias, 2021). The expert validation instrument is a rating scale from 4 to 1 (very good - less good). The total score obtained from the validator is then calculated as a percentage and classified based on the product category. The determination of product categories is described in the following table.

Table 1. Product Feasibility Category

Percentage of Feasibility	Feasibility Category
76-100%	Very good
51-75%	Good
26-50%	Pretty good
0-25%	Less good

Then, further data was obtained from the user trial questionnaire of grade III elementary schools. The user trial instrument was in the form of a Guttman scale. The Guttman scale uses two intervals: ever, never; agree, disagree; yes, no; and the goal is to ask for a definite answer from the respondent (Muchson, 2017). The Guttman scale for learners is given intervals of 1 to 0 with details of scale 1 for yes and 0 for no. The total score obtained from the user trial is 1 to 0. The total score obtained from the user trial is calculated as a percentage and classified based on the product feasibility category in Table 1.

Then, further data was obtained from the questionnaire of the user trial grade III elementary schools. The user trial instrument was in the form of a Guttman scale. The Guttman scale uses two intervals: ever, never, agree, disagree; yes, no; and the goal is to ask for a definite answer from the respondent (Muchson, 2017). The Guttman scale for learners is given intervals of 1 to 0 with details of scale 1 for yes and 0 for no. The total score obtained from the user trial is calculated as a percentage and classified based on the product feasibility category in Table 1.

RESULT AND DISCUSSION

The research results are explained through the ADDIE development model. The first stage is the analysis stage, which analyzes the problems found in the field. The problem found in this study is the difficulty of students understanding the material of obligations and rights at school. Then, the researcher analyzes the factors that cause the problem and then analyzes the right solution to solve the existing problems. This analysis stage is carried out through two stages, namely, analyzing the needs of teachers and students' needs. The teacher needs analysis stage was carried out through interviews. The problem was that Civics learning is considered too theoretical, so teachers are constrained in delivering material. The use of learning media that tends to be less varied causes boredom among students, and in the end, students do not listen to the teacher's explanation. Therefore, students tend to be careless when answering assignments.

Furthermore, analyzing the needs of students through filling out questionnaires. It was found that students are interested in learning Civics but still have difficulty with the material of obligations and rights at school, which impacts the imbalance in the application of obligations and rights at school. In addition, it is known that most students can operate cell phones and often use them to play games rather than study. Therefore, innovations are needed to overcome the existing problems. Teachers argue that children like to play games so that the cognitive students will more easily process the material. However, teachers admit they have never used educational game products that utilize gamification elements in Civics learning. Teachers believe educational games can facilitate the delivery of Civics material, so teachers need this media. This is supported by the statements of grade III elementary school students who need learning media in the form of colorful digital educational games full of pictures and entertainment so that learning Civics is more fun.

After the analysis stage is complete, the next stage is the design stage. The researcher realized that one of the Civics learning materials most students consider difficult is the material on school obligations and rights. Therefore, researchers set indicators based on the basic competencies of the material on obligations and rights at school in grade III SD. The material content in the digital educational game is the definition of obligations and rights at school and examples of their implementation in everyday life. After determining the basic competencies, indicators, and learning objectives, researchers formulated material from various sources to serve as a benchmark in preparing the material. Then, creating the material content in the game, the researcher compiled the game flowchart. The flowchart shows the process flow in a media. Researchers use flowcharts to simplify the development of digital educational games. After designing the flowchart, researchers developed a storyboard. Researchers compiled storyboards chronologically to facilitate the development of digital educational games. Researchers determine sketches of various digital educational game material elements, sketches of button settings and navigation icons, and layout designs. Researchers in developing digital educational games will later realize this storyboard design. In addition, researchers also began compiling instruments and determining expert validation and research locations.

The development stage is the realization of the design of the previous stages. The development of a digital educational game entitled "*Aksi Hakwa di Sekolah*" is assisted by game developers using several supporting applications such as Construct 3, Coreldraw, Adobe After Effect CC, and Adobe Audition CC. The digital educational game *Aksi Hakwa di Sekolah* aims to facilitate Civics learning while providing a learning experience that is fun, practical, interactive, and builds and increases students' learning motivation. This digital educational game is published as an Android application that students can play anywhere and anytime. The digital educational game Aksi Hakwa di Sekolah contains explanations of material about obligations and rights at school in the form of dialog. In addition, examples of implementing obligations and rights at school are packaged as quizzes to train students' critical thinking. Gamification elements also increase students' motivation using the digital educational game *Aksi Hakwa di Sekolah*. The following are details of the results at the development stage.

Figure 2. Game View of *Aksi Hakwa di Sekolah*

After the development stage is complete, the next stage is implementation. At this stage, products published into applications must first be validated by media experts, material experts, and linguists. Expert validation aims to make the resulting product better. If there are still shortcomings, the validator will provide criticism and suggestions for improvement so that users can test the developed product. The recapitulation results of the validation of media experts, material experts, and linguists are described in the following table.

Table 2. Recapitulation of Expert Validation Results

No.	Validator	Maximum Score	The score obtained	Percentage	Category
1.	Media expert	40	37	92,5%	Very good
2.	Material expert	40	32	80%	Very good
3.	Linguist	28	23	83%	Very good
			Average percentage of score	85,16%	Very good

There were several criticisms and suggestions during the expert validation, such as making one HOTS question about obligations and rights at each school location, placing the instructions menu above the game start menu, placing a small campus logo in the upper right corner, adding a learning objectives menu, changing the font to Arial, completing the usage tool, and paying attention to the suitability of language with the characteristics of students. Based on these criticisms and suggestions, the digital educational game *Aksi Hakwa di Sekolah* was improved again. The validation results show that the digital educational game *Aksi Hakwa di Sekolah* gets an average percentage score of 85.16%, which is included in the very good category and is suitable for continuing to the user trial stage.

User trials are divided into two stages, namely group tests and field tests. Group tests were conducted to determine the ease of accessibility and students' interest in the digital educational game media developed. The group test involved 10 grade III elementary school students with a depiction of different levels of cognitive ability. Meanwhile, the field test involved 31 grade III elementary school students with different levels of cognitive abilities. In the first stage, learners were instructed to install Aksi Hakwa di Sekolah digital educational game application on their cell phones or tablets. Then, learners are asked to read the game instructions on the instructions button. As long as learners play digital educational games, researchers pay attention to the course of the trial.

Last is the evaluation stage. The evaluation stage aims to measure the feasibility of the Aksi Hakwa di Sekolah digital educational game as a learning medium in the classroom. Researchers distributed questionnaires for students to fill out. Then, the average percentage of user test scores was calculated and recapitulated. The following are the results of the group test questionnaire and field test.

Table 3. Recapitulation of User Test Results

Test results	Maximum percentage	Percentage obtained
Group test	100%	100%
Field test	100%	99,3%

Based on Table 3, it is known that the results of the group test and field test show a percentage of 100% and 99.3%, which are included in the very good category. Research and development of digital educational games based on gamification on Civics learning material on obligations and rights in grade III elementary schools has undergone five ADDIE stages. The results showed that the digital educational game *Aksi Hakwa di Sekolah* was included in the very good category. This digital educational game can facilitate Civics learning, especially the material of obligations and rights at school. This is in line with the opinion of Rohayati et al. that educational games are games that have the aim of arousing children's interest in learning and facilitating understanding of learning subject matter (Rohayati, Astra, & Suwiwa, 2019). When learning using digital educational games, students also look active and enthusiastic. This shows that using educational games encourages students' active participation in lessons and thus can help learning activities (Selvi & Çoşan, 2018). Through the development of the digital educational game *Aksi Hakwa di Sekolah*, third-grade elementary school students can use their devices more positively.

CONCLUSIONS AND RECOMMENDATIONS

Aksi Hakwa di Sekolah digital educational game application has undergone five stages of the ADDIE development model. The first stage is the determination of the *Aksi Hakwa di Sekolah* digital educational game application as a solution to existing problems through two stages of analysis, namely, the teacher needs analysis and learner needs analysis. Then, the design stage. Researchers began designing digital educational games for *Aksi Hakwa di Sekolah*, starting from the scope of the material, flowchart, and storyboard design. In addition, researchers also began to compile instruments and determine expert validation and research locations. The development stage is the realization of the design of the previous stages. This digital educational game is published as an Android application containing explanations of material about obligations and rights at school and examples of their implementation. Next is the implementation stage. At this stage, researchers conducted an expert validation test, which obtained an average percentage score of 85.16%, included in the very good category. After making revisions and being declared feasible by expert validators, researchers conducted user trials through two stages, namely group tests and field tests. The group test results showed an average percentage score of 100%, and the field test results showed an average percentage score of 99.3%, both of which were included in the excellent category. These results indicate that the digital educational game *Aksi Hakwa di Sekolah* is suitable for learning Civics material on obligations and rights in grade III schools.

There are several recommendations for several parties: 1) Students are expected to read the game instructions carefully when using digital educational games. 2) Teachers can become facilitators so that learning runs smoothly. 3) For further researchers to conduct experimental research to test the effectiveness of development products.

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