

## Game innovation: a case study using the Kizzugemu visual novel game with TyranoBuilder software in elementary school

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### ABSTRACT

This research aims to find out the innovation of the Kizzugemu visual novel game with TyranoBuilder software in elementary school Javanese language learning. The lack of game media innovation in elementary school Javanese language learning is the background of this research. The research method is descriptive and qualitative, with data mining techniques; observation, in-depth interviews, and documentation that present the results of descriptions of the innovation, features, application, and impact of using the game in elementary Javanese language learning. The research subjects were the class teacher and 24 fifth-grade students of Madrasah Ibtidaiyah Ma'arif Bulurejo Magelang, Indonesia. The results showed the game's innovation in multimedia-based game updates, applications, videos, sounds, and texts with the meaning of children's games in Javanese, Javanese alphabet, Indonesian, and English. Game features are in the form of reading text in each scene and visualized in the material of the Javanese language. The implementation of the game is carried out through five stages which impact teacher awareness, learning media innovation, improved learning outcomes, activeness, understanding of Javanese, and support from parents and schools. Future research needs to explore visual novel game innovation through the latest software.

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## 1. INTRODUCTION

The utilization of games as learning media in elementary schools has been carried out in various countries [1]-[2]. This form of learning innovation has a positive impact on education [3], [4]. Learning innovation with game media is a response to the learning needs of elementary school students in the digital era [5]. The utilization of information and communication technologies (ICT) through game media in learning local languages, national languages, and international languages is an alternative to facilitate elementary school student's understanding of language recognition materials, words, sentences, literature, stories, reading, writing, speaking, and other skills [6]-[7].

Digital game innovation is a new idea in the form of multimedia-based games, electronics, applications, videos, and other elements in learning. The characteristics of digital games in education have goals, results, competition, interaction, and representation of the story or material contained in it [1], [8]-[9]. Digital educational games are software (applications) that integrate computer-based video games to support learning objectives, attract student attention, and encourage thinking skills, play, socialization, and cooperation in a learning environment [10], [11]. Educational games have a positive impact on structured, organized student activities for fun learning, enjoyed by students to support goal achievement, and increased understanding by primary school students [12], [13]. As a form of innovation in education, game media simulates a complex world to be simple and natural in learning. Game media innovation is an idea, notion, creativity, style, and renewal that teachers do in the field of technology to form digital-based professional education and realize the full potential of students [14], [15]. Some forms of game innovation in elementary schools in Indonesia take the form of media games such as Sudoku, Puzzle, Quiz, Visual Novel, Hack and Slash, and other games [16]. There is a lot of research on the use of visual novel games in Indonesia and abroad. However, but there are still few that are applied in several lessons such as Javanese language, natural education, social education, and mathematics in elementary schools [17], [18].

Visual novel games are digital-based media games released on the NEC PC-6001, designed by Yuji Horii, published by Enix, and are a game genre first introduced and popularized in Japan [19], [20]. Visual novels are novels visualized in illustrated images that have conversations, players can choose the story plot, presented in full color with various sound effects to make readers play it in a fun way. Visual novels help teachers improve student learning outcomes, activeness, and comprehension [21], [22]. The visual novel game features consist of five design dimensions to be used as media in language learning, namely learning through choice, story plot, mini-game, exploration, and non-interactive [23], [24]. Audio-visual-based game media positively impacts on elementary school students because it builds an interactive, communicative, and constructive environment [25]. Visual novel games are developed through TyranoBuilder software with the company TyranoBuilder visual novel studio in Japan initiated by programmer Hiroshi Nagatani. This software has been used since 2015 to create visual novel games in Japan in English for elementary school students and is now used in other parts of the world [26], [27].

Several studies mention the innovation of visual novel games through TyranoBuilder software applied as a gaming medium in schools. TyranoBuilder is a complete visual interface designed on top of TyranoScripts functionality that produces multiplatform visual novels without coding. Through TyranoBuilder software, creating a visual novel game is as simple as dragging and dropping assets and text on the screen, just like designing a Microsoft PowerPoint presentation slide. TyranoBuilder features Strikeworks' TryanoScript scripting, a new multiplatform visual script for developing visual novel games in education [28], [29]. The visual novel games need to be innovated in Javanese language learning because they are by the times and answer the needs of elementary school students in Indonesia. Visual novel games build an active, interactive, fun, student-centered learning climate, respond to the needs of ICT advances, and improve student understanding [30], [31]. From the review of these studies, it recommends learning innovations through visual novel games to improve learning outcomes, activeness, and student understanding in cognitive aspects through the use of visual novel game innovations [31], [32], because the use of game media can improve language comprehension in elementary school students [33].

Several types of research mention the problems of learning Javanese in elementary schools, namely the disorganization of learning and management, the lack of games, and the lack of games [34], and the lack of student skills in understanding *Macapat* (Javanese traditional song) material (*guru gatra/several arrays in stanza*, *guru lagu/rhyme sound equation*, and *guru wilangan/syllable count*) [35], puppet material (characters in Ramayana and Mahabarata stories) [36], *Kerata Basa* (acronym), and *Arane Turunan* (synonym) materials [37], [38], and others. This indicates that game innovation in Javanese language learning in digital era elementary schools is urgent [39], [40] including strengthening the understanding of local knowledge, local genius, and local wisdom of Java [41], [42].

As the mother tongue of Indonesia, Javanese has 75.5 million speakers. Therefore, it is urgent to preserve the Javanese language from an early age through elementary school [43]. The introduction of Javanese culture, Javanese alphabet, *tembang macapat*, *wayang* stories, Javanese ethics, and other local wisdom through visual novel game media is rarely applied in elementary schools in Central Java, Indonesia [44], [45]. In learning Javanese in Islamic elementary schools in Temanggung Regency, Indonesia, based on observations, it was found that there was a lack of game media innovation, the media was still traditional, activeness, student interest in learning, parental support, and understanding of Javanese language material was not optimal. Based on this, it encourages teachers to innovate the *Kizzegemu* visual novel game for Javanese language learning. This is based on several studies that mention visual game innovation by including story elements in it to improve learning outcomes, activeness, and understanding of the Javanese language [46], [47].

This research is motivated by the problem of learning still using manual media, low learning outcomes, activeness, and understanding of the Javanese language [48]. The novelty in this research is the innovation of the Kizzugemu novel game with TyranoBuilder software by including the *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym), and *Cerita Wayang* (Puppet Stories). Javanese language learning in elementary school with Kizzugemu Visual Novel Game is rarely found. In this article, the researcher wants to explore the innovation of Mame Visual Novel Kizzugemu with TyranoBuilder software in elementary school Javanese language learning. Therefore, three questions arise in this case: i) how is the innovation of the Kizzugemu Visual Novel Game with TyranoBuilder software?; ii) how are the features of the Kizzugemu Visual Novel Game?; iii) how is the implementation of the Kizzugemu Visual Novel Game in learning the Javanese Language?; and vi) how is the impact of using the Kizzugemu Visual Novel Game on students?

## 2. METHOD

The approach of this research is descriptive and qualitative. The purpose of this research is to find out the innovation of the Kizzugemu Visual Novel Game with TyranoBuilder software in learning the Javanese language in elementary school [49], [50]. Researchers explore data in the field in the form of descriptive data consisting of spoken words or sentences from teachers and students. That is, researchers want to know how phenomena, conditions, or realities occur in the field from the knowledge and behavior of research subjects in innovating and implementing these games that impact on learning outcomes, activeness, and understanding of the Javanese Language.

The data collection techniques used are observation, in-depth interviews, and documentation by presenting the results in a description of the innovation, features, implementation, and impact of using the Kizzugemu visual novel game with TyranoBuilder software in elementary school Javanese language learning. Researchers conducted observations and in-depth interviews with classroom teachers and students from the creation process to implementing the game in the classroom. At the same time, documentation was carried out on Javanese language material documents, game applications, and Javanese language comprehension documents. This research was conducted in Madrasah Ibtidaiyah (Islamic elementary school) in Magelang Regency, Indonesia, for one semester, January 2022-June 2022.

The research location was Madrasah Ibtidaiyah Ma'arif Bulurejo, Mertoyudan District, Magelang Regency, Indonesia. This research location was chosen because it has made game innovations and has implemented them in the school, especially in Javanese language learning. The research data were taken from teachers who made game innovations and students of Madrasah Ibtidaiyah Ma'arif Bulurejo class V totaling 24 children as research subjects. Furthermore, it was described and analyzed in several stages, including data collection, data presentation, and conclusion drawing to answer research questions.

## 3. RESULTS AND DISCUSSION

### 3.1. The innovation of the Kizzugemu visual novel game with TyranoBuilder software

Kizzugemu visual novel game innovation with TyranoBuilder software refers to the concept of game innovation above, which is a new idea in the form of multimedia-based games, electronics, applications, videos, and other elements in learning with the characteristics of having goals, results, competition, interaction, representation of stories or material contained in it. Kizzugemu is a visual novel game developed by researchers through TyranoBuilder software that can be installed on Windows. As an open-access visual novel game creation software, TyranoBuilder provides a menu for creating visual novel game projects.

The project was done in several stages. First, creating a dialog script, and Javanese language materials about *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym), and *Cerita Wayang* (Puppet Stories). Second, creating a new project in the TyranoBuilder software that has been installed in Windows on the storyboards. Third, import audio, video, character images according to the material, background images through the story, effects, screen effects, characters, images, messages, media, video backdrop, system, and script toolbars for each scene. Fourth, export the Kizzugemu visual novel game project to all platforms on Windows. The project can also be shipped on the Website, iPhone, Mac, Android, and others. However, because this game is for elementary school children, with PC and internet limitations, it was chosen to be exported on Windows. After this stage is complete, the game can be used for learning.

Kizzugemu comes from two words, *Kizzu* meaning children and *gemu* (*gēmu*) meaning game [51]. This visual game innovation adjusts between multimedia-based media and materials that are suitable for teaching elementary school children with the aim that learning outcomes, activeness, and student

understanding increase in crude Javanese language material. This game was created as a follow-up to the Multimedia project study in 2021 through *TyranoBuilder Visual Novel Studio*. This game previously contained general material in the form of a mixture of Javanese Language, Natural Science, Social Science, and Mathematics. After being reviewed according to the needs of students, the game was changed to a game that contains only 5<sup>th</sup>-grade Javanese language material with Indonesian, Javanese, and English.

In the aspects of competition, interaction, and representation of the story in Kizzugemu, each player has to choose one step (strategy) from the profile strategies and based on the selected strategy, the player gets a reward using a utility function. Designing a suitable utility function is very important as it leads to optimization in channel allocation [52]. It's relevant to research that states that attractive media and learning tools can increase millennials' interest, especially for conceptual learning [16] such as Javanese as the mother tongue of elementary school students.

The learning design of the Kizzugemu visual novel game in learning Javanese consists of five aspects. First, providing material choices in the developed game, namely *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym), and *Cerita Wayang* (Puppet Stories). *Aksara Jawa* (Javanese alphabet) material contains the basic letters of the Javanese alphabet (*carakan*), additional letters of Javanese characters, and vowels of Javanese characters (*sandangan*). *Tembang Macapat* material, contains songs *Gambuh* (song whose form is determined by the number of lines in the stanza, which is 5 lines), *Mijil* (song whose form is determined by the number of lines in the stanza, which is 6 lines), *Pangkur* (song whose form is determined by the number of lines in the stanza, which is 7 lines), and *Pocung* (song whose form is determined by the number of lines in the stanza, which is 4 lines). *Kerata Basa* (acronym) and *Arane Turunan* (synonym) materials contain acronyms and synonyms in Javanese. The puppet stories material in this game is not a long story but just a short story about the puppet characters, namely the puppet characters in the story of *Ramayana* (*Prabu Ramawijaya*, *Dewi Sinta*, and *Dasamuka* or *Rahwana*), and puppet characters in the *Mahabarata* stories (*Puntadewa*, *Werkudara*, *Arjuna*, *Nakula*, and *Sadewa*), and puppet character *Punakawan* (*Gareng*). Second, developing a story plot in which there are interactive dialogs from the two main characters created by the researcher, namely Jean (male character) and Rain (female character). Third, learning mini-games related to the evaluation of material understanding. Fourth, exploration of the four materials presented in the game. Fifth, the presentation of non-interactive materials through the material of the *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym). The visualization of the stages of innovation in making the Kizzugemu visual novel game with TyranoBuilder software can be seen in the Indonesian version of the manufacturing manual, which can be downloaded online at the URL <https://bit.ly/Kizzugemumannual>. The visualization can be seen in Figure 1.

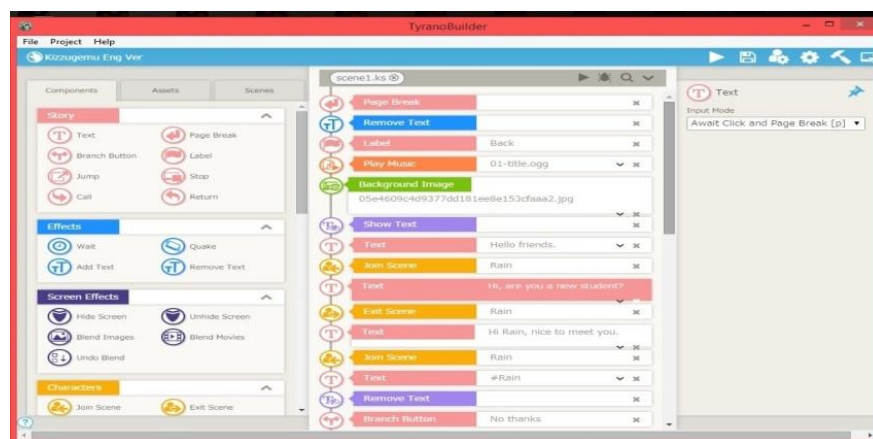


Figure 1. The process of making a game visual novel Kizzugemu from the storyboards

### 3.2. The features of the visual Kizzugemu game

This game contains material on the *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym), and *Cerita Wayang* (Puppet Stories), which are presented with reading text in each scene so that the flow is not monotonous, making students interested in continuing the next scene. Game elements are the main components that make up the nongame system, where common game elements consist of avatars, ranks, levels, storylines, and rules [5]. Here is the initial appearance of the Kizzugemu game titled TyranoBuilder-Visual Novel Studio in Figure 2.

*Game innovation: a case study using the Kizzugemu visual novel game with ... (Hamidulloh Ibd)*

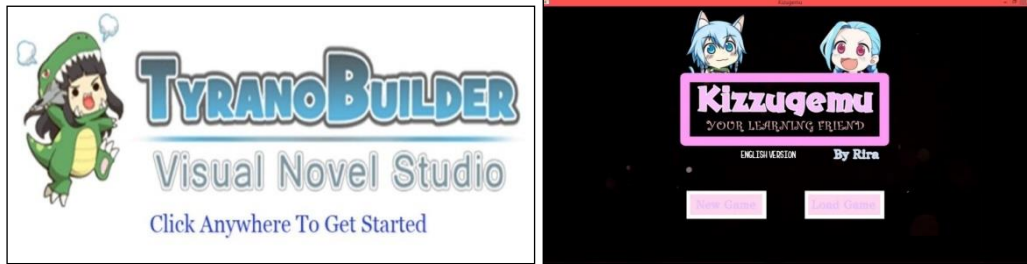


Figure 2. The initial view of the Kizzugemu visual novel game

In the game, several scenes with options direct students to choose them. The correct answer leads to the next scene. In the middle of the scene in the game, there is a menu that directs students to choose between several options that lead to four Javanese language materials, namely the *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym), and *Cerita Wayang* (Puppet Stories). This game feature is visualized in several menu options. Figure 3 is a visualization of the *Aksara Jawa* (Javanese alphabet) material activity, Figure 4 is the *Tembang Macapat* (Macapat song) material activity, Figure 5 is the *Kerata Basa* (acronym) and *Arane Turunan* (synonym) material activity, and Figure 6 is the *Cerita Wayang* material activity. The visualization can be seen in Figures 3-6.



Figure 3. *Aksara Jawa* (Javanese alphabet) material activity



Figure 4. *Tembang Macapat* (Macapat Song) material activity

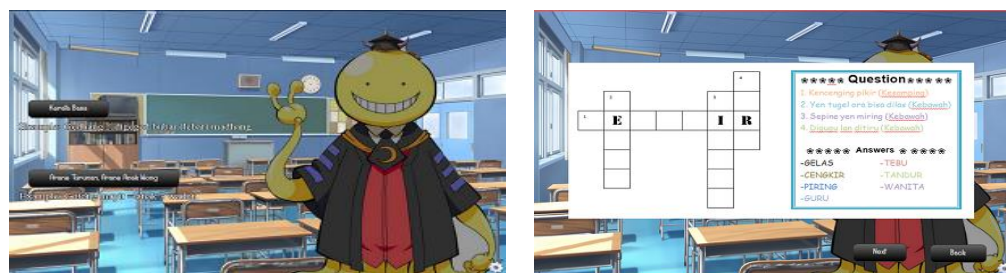


Figure 5. *Kerata Basa* (acronym) and *Arane Turunan* (synonym) material activity





Figure 6: *Cerita Wayang* (Puppet stories) material activity

The seen in the video on Youtube via URL <https://bit.ly/Kizzugemuuserguide>. technical creation of the Indonesian visual novel Kizzugemu Game can be Kizzugemu visual novel game extract files can be accessed online via this URL <https://bit.ly/Kizzugemudownload> the Indonesian version, and <https://bit.ly/KizzugemuEngVer> English version. Kizzugemu Visual Novel Game has obtained copyright from the Directorate General of Intellectual Property of the Ministry of Law and Human Rights of the Republic of Indonesia, which can be seen on this URL <https://bit.ly/KizzugemuCopyright>. The game is available online at *Tokopedia* e-commerce (<https://bit.ly/KizzugemuTokopedia>) and *Shopee* e-commerce (<https://bit.ly/KizzugemuShopee>).

### 3.3. The implementation of the Kizzugemu visual game in Javanese language learning

The implementation of using this game is done through several steps. In the pre-learning stage, the teacher installs the game on Windows on each student's laptop. The scene during learning has several steps. First, the teacher gives instructions on how to play the Visual Kizzugemu Game to students. Second, students practice the Kizzugemu Visual Game directly according to the choice of material. Third, they read the material in the Kizzugemu Visual Game, which is interactive and non-interactive in which there are games. For the game on Kizzugemu Visual Game each material, it can be described as shown in.

- a. In the *Aksara Jawa* (Javanese alphabet) material, the game is in the form of multiple-choice questions that match the Javanese alphabet with its sound in the answers provided in the Kizzugemu Visual Game. In this game, students are given help using Javanese alphabet clue windows. (See picture 3).
- b. In the *Tembang Macapat* material, the game is in the form of guessing songs and guessing lyrics. The song choices presented are *Gambuh* (song whose form is determined by the number of lines in the stanza, which is 5 lines), *Mijil* (song whose form is determined by the number of lines in the stanza, which is 6 lines), *Pangkur* (song whose form is determined by the number of lines in the stanza, which is 7 lines), and *Pocung* (song whose form is determined by the number of lines in the stanza, which is 4 lines) (See picture 4).
- c. In the *Kerata Basa* (acronym) and *Arane Turunan* (synonym) material, the game is a crossword puzzle in the form of *Kerata Basa* (acronym) and *Arane Turunan* (synonym). (See picture 5).
- d. In *Cerita Wayang*, the game is for students to guess the puppet picture according to the character's name. When the choice is correct, the text appears with the answer you are right and a description of the chosen puppet character, and vice versa. (See Figure 6).

After all, learners have practiced the game; the teacher gives a worksheet of Javanese language material related to the content of the material in the game. Learner's work and collect worksheets from the teacher. The application of the Kizzugemu Visual Game in learning Javanese in the Indonesian version can be seen in the Youtube video at the URL <https://bit.ly/Tutorialusingthevisualgamenovelkizzugemu>.

### 3.4. The impact of using the Kizzugemu visual novel game on students

Kizzugemu visual novel game innovation has several impacts. The first is teacher awareness of using software and game applications in learning. This is in line with several studies that mention understanding of the use of digital game applications and software through game innovation, digital platforms, and digital information literacy [53], [54]. Second, the presentation of learning media is unique, different, cheap, open, and contextual, because visual novel games have these characteristics according to other research findings [55], [56]. Third is the improvement of Javanese learning outcomes. Before the game, the average Javanese learning outcome was 60.7, and after its use became 96.9. This is in line with several studies that mention the use of game applications has an impact on Javanese learning outcomes [57], [58]. Fourth, increasing student activeness in the learning process is based on the findings of several studies [59], [60]. Fifth, the understanding of Javanese language materials on the *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym), and *Cerita*

Wayang (Puppet Stories) [61], [62]. Sixth, support from parents and schools to students by facilitating infrastructure, facilities, and unique assistance [63], [64].

#### 4. CONCLUSION

The innovation of the Kizzugemu visual novel game with TyranoBuilder software is carried out in the form of updating multimedia-based games, applications, videos, sounds, and texts with the meaning of “children’s games” in Javanese, Javanese script, Indonesian, and English. The Kizzugemu visual novel game features reading text in each scene, so the flow is not monotonous, making students interested in continuing the next scene. Game features Javanese alphabet are visualized in material of *Aksara Jawa* (Javanese alphabet), *Tembang Macapat* (Macapat Song), *Kerata Basa* (acronym) and *Arane Turunan* (synonym), and *Cerita Wayang* (Puppet Stories). The application of Kizzugemu Visual Game in learning is carried out in five stages, starting from installing the application on a laptop, explaining the flow of use, students practicing games, students watching puppet video scenes, and students doing assignments from the teacher. The use of the Kizzugemu Visual Novel Game impacts six things; teacher awareness, unique learning media innovation, improved learning outcomes, activeness, understanding of Javanese, and support from parents and schools.

Kizzugemu visual novel game has several advantages. First, it can be developed openly and for free through TyranoBuilder software. Second, developers can make innovations according to the games’ material, goals, and objectives. Third, games development results TyranoBuilder software can be exported to Windows, Website, iPhone, Mac, Android, and others. Fourth, the games developed are easy to use without coding. According to the world of children, cheap, contextual, and can be adjusted with other supporting materials such as videos, images, sounds, scripts, and others. This study has three limitations. Namely, the game can only be installed on Windows, the game score results at the end of the scene do not appear, and there is no dubbing sound on the Branch Button. Future research needs to explore visual novel game innovation through the latest software to be applied in various subjects in elementary schools.

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