



Journal of Educational Sciences

Journal homepage: <https://jes.ejournal.unri.ac.id/index.php/JES>



P-ISSN
2581-1657

E-ISSN
2581-2203

Development of NIBIT FIRE Educational Game Based Learning Media for Grade III Elementary School on Place Value Material

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ARTICLE INFO

Article history:

Received: 20 August 2026

Accepted: 28 Sept 2026

Available Online: 05 Oct 2026

Keywords:

NIBIT FIRE,
Construct 3,
Learning Media,
Number Place Value,
Elementary School

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Article Doi:

<https://doi.org/10.31258/jes.10.10.p.210-226>

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ABSTRACT

This study was motivated by the difficulties third-grade elementary school students face in understanding place value specifically in distinguishing digit values across the ones, tens, hundreds, and thousands places as well as the need for concrete, visual, and interactive learning media. The study aimed to develop NIBIT FIRE, a Construct 3-based educational game for teaching place value, and to assess its feasibility and practicality. A Research and Development (R&D) method using the ADDIE model comprising the analysis, design, development, implementation, and evaluation stages was employed. The research subjects consisted of one teacher and 28 third-grade students from SD Negeri 002 Samarinda Kota. Data were collected through observation, interviews, expert validation, and teacher and student response questionnaires. The results showed that NIBIT FIRE achieved a feasibility score of 94% from media experts and 87% from subject matter experts, both falling into the "highly feasible" category. Student responses yielded a score of 93.75%, while teacher responses scored 85%; both results fell into the "highly practical" category. Thus, NIBIT FIRE serves as a viable game-based mathematics learning medium to support place value instruction for third-grade elementary school students.

1. Introduction

Education plays a central role in developing students' potential and character while contributing to the improvement of human resources (Yumna et al., 2025). In schools, this role is realized through learning activities that facilitate interaction between teachers and students to achieve predetermined educational goals (Ramadhana et al., 2024). Learning is a systematic interaction between educators and learners designed to achieve learning objectives (Ramadhana et al., 2024). Through meaningful learning experiences, students are expected to develop knowledge, skills, and attitudes that can be applied in daily life. Student

engagement is also a crucial element of the learning process, as active participation supports conceptual understanding and learning outcomes (Juniarmi, 2025).

Technological advancements are driving changes in instructional delivery, including the adoption of more innovative, student centered learning approaches. Digital technology enables teachers to present learning materials through various forms of interaction and visualization, thereby making the learning experience more engaging for students (Arafah et al., 2023; Munawaroh et al., 2023). Technology based media can also foster student motivation and participation in mathematics learning (Mulyosari & Khosiyono, 2023). Integrating technology into instruction can further enhance student interest and engagement in the learning process (Sari et al., 2024). Therefore, learning media should be selected based on students' characteristics and learning needs to support the achievement of learning objectives (Fitriana & Mariono, 2023).

Learning media can facilitate the delivery of instructional content by presenting information in a clearer and more engaging manner (Yusron et al., 2024). Interactive media can also encourage active student participation and aid in understanding mathematical concepts that are abstract and difficult to visualize (Juraidah et al., 2025; Lestari & Wati, 2025). Technology based media can further enhance student engagement through interactive activities that provide opportunities for students to experiment, receive feedback, and refine their understanding (Nababan et al., 2024). particularly important in primary school mathematics, where visualization and concrete experiences are essential. One concept requiring such support is place value the value of a digit determined by its position as ones, tens, hundreds, or thousands (Purnomo, 2019). An understanding of place value serves as the foundation for reading, writing, comparing, and determining the value of numbers (Yuliani et al., 2026). However, students can still have difficulty relating the position of the digits to their grades, so a medium that can visualize the concept interactively and iterously is needed.

However, students may still struggle to connect a digit's position with its value, creating a need for instructional media that can visualize this concept in an interactive and repetitive manner. This need was confirmed by preliminary research conducted with third-grade students at SD Negeri 002 Samarinda Kota using observations, interviews, and questionnaires. The findings indicated that students still faced difficulties distinguishing place values and reading or writing numbers. Although teachers had utilized projectors and student worksheets, there was a need for more diverse and interactive learning media. Students also demonstrated an interest in visual and game-based media. Furthermore, the availability of Chromebooks, internet access, and LCD projectors at the school supported the implementation of digital learning media.

Several studies have developed educational games for mathematics learning in elementary schools. Anggoro et al., (2024) develop Fractify based on Construct 3 for class IV fractional material, while Fachruraji et al., (2025) and Oula et al., (2024) developed a Construct 3 based game for basic mathematics as well as addition and subtraction operations. These studies demonstrate that educational

games can serve as interactive media for mathematics learning. However, the games developed focus more on question and answer activities, while the presentation of material or concept explanations is still limited. Meanwhile, the needs of grade III students of SD Negeri 002 Samarinda Kota show the need for media that not only provides exercises, but also presents place value materials and integrates them with game activities. This research provides novelty through the development of NIBIT FIRE an educational game that integrates place value material, Learning Outcomes (CP), and Learning Objectives (TP), alongside three game levels featuring distinct types of challenges. NIBIT FIRE also incorporates visualizations of ones, tens, hundreds, and thousands positions and provides feedback on student responses during gameplay. Furthermore, *NIBIT FIRE* is designed with a system requiring students to complete and review the instructional material before proceeding to the game itself. Each level is structured to encourage students to apply place value concepts through challenges related to digit positions and values within numbers. Consequently, students do not merely answer questions; they acquire content knowledge, observe conceptual visualizations, receive feedback, and apply their understanding through game activities within a unified learning flow.

Based on this description, this study aims to develop NIBIT FIRE as a Construct 3 based educational game for place value learning in grade III students of SD Negeri 002 Samarinda Kota. In particular, this study aims to: (1) develop NIBIT FIRE which integrates the concept of place value into interactive game activities; (2) determine the feasibility level of NIBIT FIRE based on the assessment of media experts and subject matter experts; and (3) assess the practicality of NIBIT FIRE based on teacher and student responses. The research is expected to yield an alternative mathematics learning medium suited to the characteristics of third-grade students and to help create a more visual, interactive, and meaningful learning experience regarding place value.

2. Methodology

This study employs a Research and Development (R&D) approach to develop and evaluate an educational game as a learning medium. The R&D approach was selected because the study focuses on producing a learning product and examining its suitability based on identified learning needs (Okpatrioka, 2023). In the field of education, R&D methods can be used to generate learning innovations such as media or tools—that are more effective and aligned with students' characteristics (Sugiyono, 2019). The development process follows the ADDIE model, comprising five stages Analysis, Design, Development, Implementation, and Evaluation (Aprilia et al., 2024).

The study was conducted at SD Negeri 002 Samarinda Kota, located on Jalan Bayangkara No. 51, Bugis Village, Samarinda Kota District, Samarinda City, East Kalimantan Province. The participants consisted of one third grade teacher and 28 third grade students, consisting of 13 males and 15 female students. NIBIT FIRE, a Construct 3 based educational game designed to teach place value, was developed as the learning medium investigated in this study. Data were obtained through

observation, interviews, and questionnaires. Instruments included observation sheets, interview guidelines, expert validation sheets, and teacher and student response questionnaires. Expert validation was conducted to assess the feasibility of the media from the perspective of the media and subject matter, while teacher and student questionnaires were used to examine their responses to the use of NIBIT FIRE in the learning process. Preliminary analysis covered learning needs, the curriculum, and teaching materials to establish the requirements for media development (Arikunto, 2021).

Product validation was conducted by four validators, comprising two media experts and two subject matter experts. These validators were selected based on their relevant educational backgrounds, expertise, competencies, and professional experience, with a minimum qualification of a Master's degree. The media experts possessed expertise in media or educational technology, while the subject matter experts specialized in elementary mathematics education, specifically place value. The media expert validation instrument covered five aspects: visual appearance, media readability, technical usage, flexibility, and accessibility. The subject matter validation instrument assessed learning objectives, content, language, and evaluation items. The research instrument employed a five-point Likert scale to obtain evaluations of the developed learning media. The Likert scale was utilized by providing multiple response options indicating the respondent's level of agreement with each statement in the research instrument (Sugiyono, 2022). Data obtained from the assessment scores on the expert validation sheets were subsequently analyzed to determine the feasibility category based on the Likert scale presented in Table 1.

Table 1. Categories of Expert Ratings Based on the Likert Scale

Score	Category
5	Strongly agree
4	Agree
3	Simply Agree
2	Disagree
1	Strongly Disagree

Sources: Effendi et al. (2021)

Meanwhile, response instruments for teachers and students were used to gauge reactions to the product developed by the researcher. This study employed a four-point scale to provide respondents with more decisive answer choices, eliminating the option for a neutral or undecided stance. This scale was expected to reveal more clearly the tendencies of teachers and students in evaluating the developed learning media. Furthermore, the four-point scale was considered simpler and easier to understand, particularly for the primary school students and teachers acting as respondents. Consequently, the use of this scale could help obtain response data that is more objective and reflective of actual conditions. The study produces both qualitative and quantitative data. Qualitative information is obtained from observations, interviews, and suggestions provided by validators during the development and revision process. Quantitative data consists of scores from expert validation as well as teacher and student response questionnaires (Arikunto, 2021). The criteria for evaluating responses are presented in Table 2 below.

Table 2. Categories of Response Assessment Based on the Likert Scale

Score	Category
4	Strongly agree
3	Agree
2	Disagree
1	Strongly Disagree

Sources: Nikmah et al. (2025)

The validation score was analyzed using percentage calculation to determine the feasibility of NIBIT FIRE, while the questionnaire score was used to determine the practicality of the developed media. The results were then interpreted based on the predetermined assessment criteria. The score obtained from the assessment results was then calculated using the percentage formula in accordance with the Arikunto & Jabar (2018) as follows:

$$P = \frac{f}{N} \times 100\%$$

Description:

P: Percentage of eligibility score

f: Total scores given by validators

N: Ideal maximum score

The results of the calculations are then used as a basis for determining the level of product feasibility and practicality of the media based on the responses of teachers and students, as presented in Table 3 and Table 4:

Table 3. Product Feasibility Scale

Average score	Category
$81\% \leq X \leq 100\%$	Highly Feasible
$61\% \leq X < 81\%$	Feasible
$41\% \leq X < 61\%$	Quite Feasible
$21\% \leq X < 41\%$	Less Feasible
$X \leq 21\%$	Very Unfeasible

Sources: Arikunto & Jabar (2018)

NIBIT FIRE is categorized as feasible when the validation score reaches at least 61%. This criterion indicates that the developed media meets the feasibility standards required for implementation in learning activities.

Table 4. Practicality Criteria Based on Teacher and Student Responses

Average score	Category
$81\% \leq X \leq 100\%$	Very Practical
$61\% \leq X < 81\%$	Practical
$41\% \leq X < 61\%$	Quite Practical
$21\% \leq X < 41\%$	Less Practical
$X \leq 21\%$	Very Impractical

Sources: Saa'dah et al. (2025)

The development of NIBIT FIRE learning media is considered practical if the percentage obtained from the teacher and student response questionnaire gets a score of at least $\geq 61\%$, which indicates that the media is easy to use, efficient, and suitable to support the learning process.

3. Results and Discussion

NIBIT FIRE is an educational game-based learning medium developed using Construct 3 to teach place value concepts to third-grade students at SD Negeri 002 Samarinda Kota. After the product is developed, NIBIT FIRE is tested in learning by asking students to first access the learning menu containing place value material, then proceed to game activities consisting of three levels with different levels of challenge. Each level is designed so that students can apply the concept of place value through activities related to position and number value in numbers. The researcher directed the use of media during the trial, while the response of teachers and students was obtained through a questionnaire to find out the practicality of NIBIT FIRE. The implementation of this product was part of a research and development process utilizing the ADDIE model.

The first stage in the ADDIE model is analysis, which begins with observation and interviews with teachers at SD Negeri 002 Samarinda Kota. This activity aims to identify learning conditions, current media usage, student characteristics, and obstacles encountered when teaching mathematics. The results of the needs analysis show that mathematics learning at SD Negeri 002 Samarinda Kota still uses many books and worksheets, while the use of digital media is still limited to pictures and learning videos from YouTube. Even though teachers have used visual media, students still tend to feel bored easily because the form of media used is relatively the same and has not provided opportunities for students to interact directly with the material. This condition shows that the need for learning media does not only lie in the use of technology, but in the availability of media that is able to transform students from recipients of information to active participants in the learning process.

These needs are relevant to the characteristics of grade III elementary school students who still need a concrete, visual, interesting, and hands-on learning experience. Place value material also has conceptual characteristics because students not only need to recognize numbers, but understand that the value of a number is determined by its position in a number. For example, the same number can have different values when it is in the position of units, tens, hundreds, or thousands. Therefore, the presentation of material through text alone has the potential to make the concept less concrete for students. The use of visualization and interactive activities in NIBIT FIRE allows the concept of number position to be represented more easily by students to observe and practice.

The development of NIBIT FIRE also reinforces the view that educational games can be used not only as a means of entertainment, but as a learning environment that allows students to gain learning experiences through activities, challenges, and

feedback. Game-based interactive media can also help students understand math concepts through more engaging learning activities and actively engage students (Setiyawan et al., 2025). The findings are in line with the characteristics of NIBIT FIRE which combines place value material with game activities. Thus, games in NIBIT FIRE are not placed as additional activities after learning, but become part of the student's process in understanding and applying concepts.

At the design stage, NIBIT FIRE is designed based on the results of the analysis of needs, characteristics of grade III students, and learning objectives of place value material. The design includes the structure of the material, the flow of the game, the visual display, the navigation, and the level of the game. Flowcharts and storyboards are used as guidelines to ensure that each piece of media has a clear relationship between the learning material and the game activity (Muliadi et al., 2022). Flowchart depicts the sequence of the processes in the media, while the storyboard provides an overview of how each page looks and its activities. The design is then used as a reference in the development of NIBIT FIRE learning media. The flow chart of NIBIT FIRE learning media is presented in Figure 1.

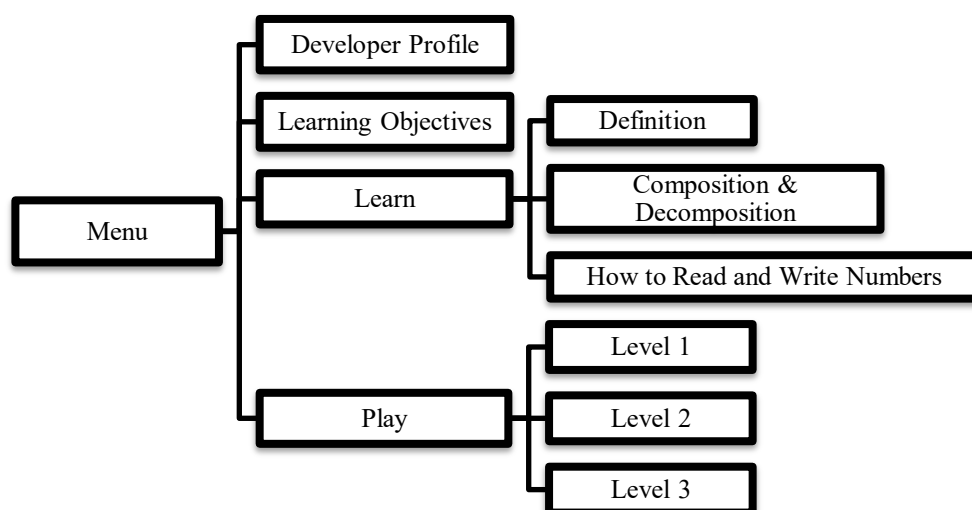


Figure 1. NIBIT FIRE Learning Media Flowchart

This flowchart serves as a reference for developing each component of the media using Construct 3. The resulting development is an educational game called NIBIT FIRE, which features several main screens as shown in Figure 2.

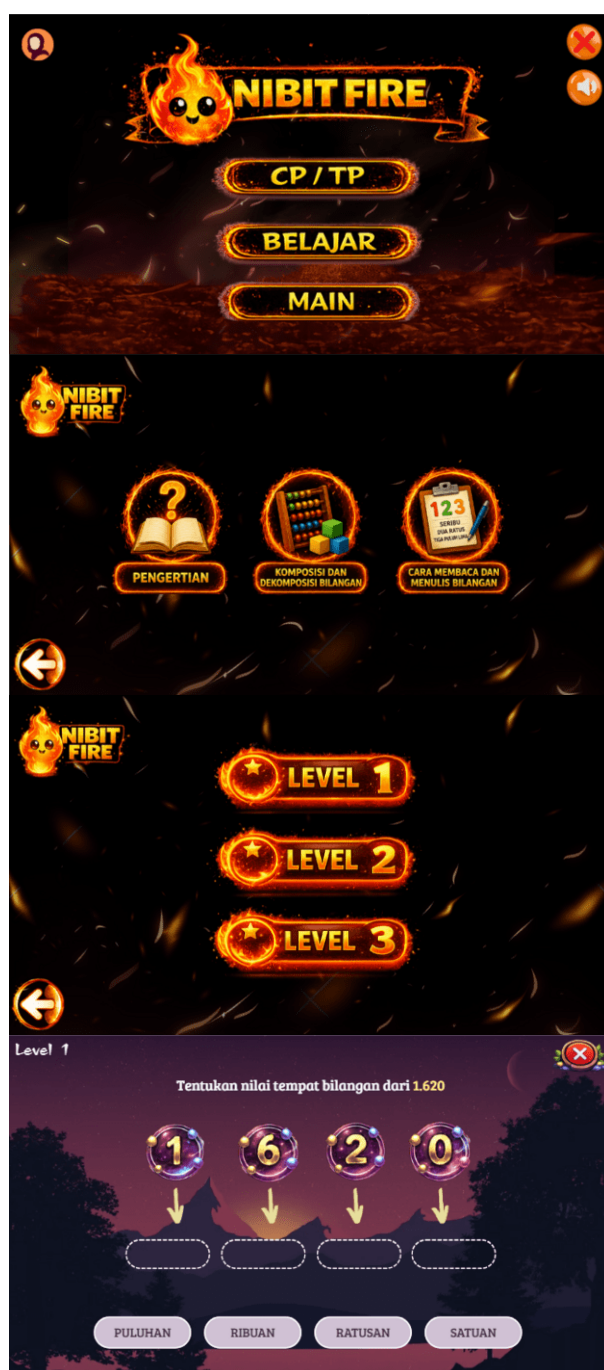




Figure 2. NIBIT FIRE design can be seen:
(Link: <https://canva.link/k4okgnah2fla5gt>)

Figure 2 presents the NIBIT FIRE learning media which consists of the main menu, CP/TP (learning outcomes and objectives) menu, learning menu, game menu, and three levels of games. The CP/TP menu contains learning outcomes and objectives that are the basis for media development. The learning menu presents material that includes the definition of the place value of numbers, the composition and decomposition of numbers, and how to read and write numbers. The game menu is equipped with three levels that are designed according to the learning material and the goals that have been set. Each section in the media is designed interactively so that students have the opportunity to learn and apply the concept of place value through game activities. The NIBIT FIRE feature integrates visualization, interactivity, tiered challenges, and feedback to provide a learning experience that matches the characteristics of grade III students. Visualization helps students understand the position of numbers, while game activities provide opportunities to apply the concept of place value directly. Graded challenges and feedback also allow students to learn gradually and know the results of the responses given.

The third stage is development, which is to realize the design of NIBIT FIRE into an educational game based on Construct 3. At this stage, all elements that have been designed, including materials, illustrations, animations, buttons, game levels, and scoring systems, are integrated into the game. The products that have been developed are then validated by media experts and subject matter experts using the validation instruments that have been prepared. The results of the validator assessment are then analyzed to determine the feasibility level of the developed product (Saa'dah et al., 2025). In addition, NIBIT FIRE was revised based on suggestions and notes from validators to produce learning media that suits the

mathematics learning needs of grade III students based on place value materials. The results of validation by media experts are presented in Figure 3.

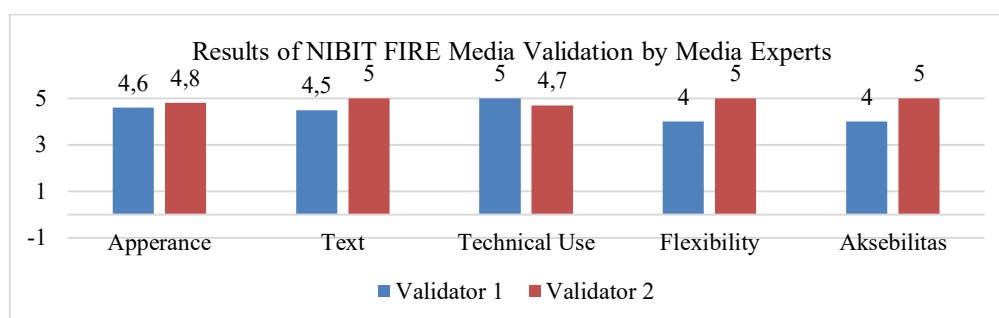


Figure 3. Diagram of NIBIT FIRE Media Validation Results by Media Experts

Based on Figure 3, the validation results by two media experts showed that media validator 1 obtained a score of 68, while media validator 2 obtained a score of 73, so that the total score obtained was 141 out of a maximum score of 150 with a percentage of 94% with the category of very feasible. These results show that NIBIT FIRE's visual and interactive features have been appropriate to support the learning of grade III students. The feasibility of the media is not only seen from the display, but also from the suitability of the game features with the learning needs of place values. The high percentage obtained shows that NIBIT FIRE has met the media feasibility aspects which include visual appearance, readability, technical use, flexibility, and accessibility. Although this category is very feasible, the validator still provided some suggestions for improvement, such as adding visualizations that are appropriate to the material, reducing too much text, increasing the use of language, and adding activities that can make students more active. Improvements were made to improve the media to better suit the characteristics and needs of grade III students. The results of validation by subject matter experts are presented in Figure 4.

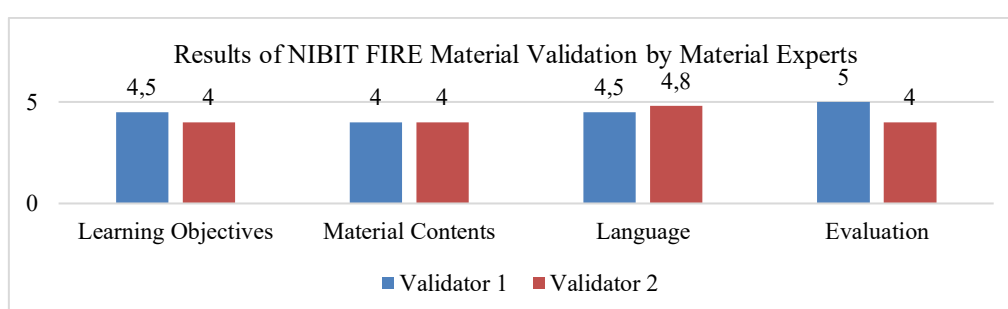


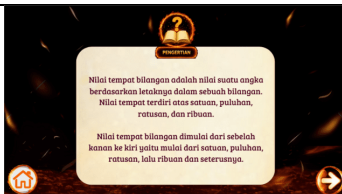
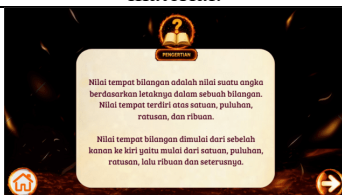
Figure 4. Diagram of NIBIT FIRE Material Validation Results by Subject Matter Experts

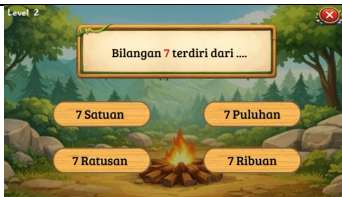
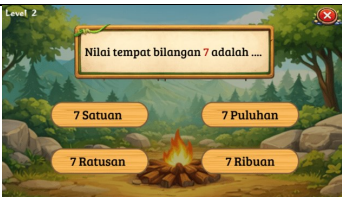
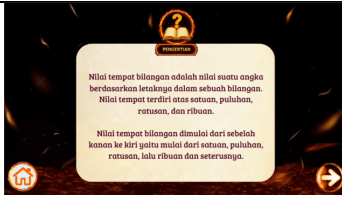
Based on Figure 4, the validation results by two subject matter experts showed that the validator of material 1 obtained a score of 44, while the validator of material 2 obtained a score of 43, with a total score of 87 out of a maximum score of 100 and a percentage of 87% with the category of very feasible. These results show that the material in NIBIT FIRE has been in accordance with the learning objectives. The

integration of place value material into the game activities provides opportunities for students to learn and apply concepts through interactive activities. This shows that the material presented in NIBIT FIRE has met the aspects assessed, namely the suitability of the learning objectives, the content of the material, language, and evaluation. The material presented includes the place value of numbers, the composition and decomposition of numbers, as well as how to read and write numbers which are then integrated into the game activities. Thus, the validation results from media experts of 94% and material experts of 87% show that NIBIT FIRE has met the eligibility criteria and is very possible to be used as a mathematics learning medium for grade III elementary school students.

The validation results show that NIBIT FIRE has a high level of feasibility to be used as a mathematics learning medium. The development of an educational game based on Construct 3 which goes through an expert validation process also shows that the media can be assessed based on the feasibility of the material and media aspects before being used in learning (Anggoro et al., 2024). Despite obtaining the "Very Feasible" category, the validator provided several suggestions for improvement, including improving the developer profile, adding images or visualizations that match the material, reducing text, and improving the use of language and learning activities. The results of the revisions based on the validator's suggestions are presented in Table 5.

Table 5. Revised Results of NIBIT FIRE Learning Media

Revised Sections	Before Repair	After Repair
Developer Profile	 The developer's profile picture does not use the university's alma mater.	 The developer's profile picture was replaced with a photo using the university's alma mater.
Media visualization	 The presentation of the material still has limitations in the images or visualizations that support the material.	 Images and visualizations that match the material are added to make the presentation more informative and engaging.
Presentation of Materials		

	The text in the material is still too much so that it is not interesting for students to read.	The text in the material is minimized and arranged more concisely to make it easier for students to understand.
Language	 There are some inaccurate uses of language.	 The use of language is improved to better suit the characteristics and level of understanding of grade III students.
Learning Activities	 Activities in the media are still more focused on reading materials.	 Pictures and activities are added that encourage students to be more active and think critically.

After improvement based on the suggestions and feedback of validators, NIBIT FIRE has been refined and ready to be used in learning activities. The fourth stage is implementation, namely the application of products that have been developed according to learning objectives (Shakeel et al., 2022). At this stage, NIBIT FIRE was applied to the learning of mathematics of number place value material in grade III of SD Negeri 002 Samarinda City on Tuesday, July 28, 2026. The trial was carried out to obtain media practicality data through teacher and student responses during the implementation process in the field (Marwah et al., 2026). The practicality of the product was assessed based on user responses after using NIBIT FIRE learning media. Teachers and students then filled out a response questionnaire that had been prepared, then the results were analyzed to determine the level of practicality of the media (Aprillia & Pratiwi, 2022). The results of students' responses to the use of NIBIT FIRE are presented in Table 6.

Table 6. Results of Student Responses to IBIT FIRE

Assessment Aspects	Score (f)	Maximum Shoes
Visual	103	112
Presentation of Materials	313	336
Language	211	224
Media Display	211	224
Learning Motivation	105	112
Daya Tarik Media	107	112
Quantity	1.050	1.120
Percentage	93,75%	
Category	"Very Practical"	

On the Table 6, it can be concluded that the results of the field test by the students showed a percentage score of $P = 93.75\%$. The score of the student response questionnaire in the field test was in the range of $81\% \leq X \leq 100\%$, with the

category "Very Practical" used in the learning process. The results showed that NIBIT FIRE received a positive response from students on the aspects assessed. The percentage showed that the visual aspects, presentation of the material, language, appearance, learning motivation, and media attractiveness received a positive response from students. In addition, the questionnaire given to teachers aims to find out the teacher's response to the use of learning media. Teachers' responses to learning media can be one of the indicators in determining the level of practicality of the media developed (Aprillia & Pratiwi, 2022). The assessment of the practicality of NIBIT FIRE based on the teacher's response is shown in Table 7.

Table 7. Results of Teachers' Responses to NIBIT FIRE

Assessment Aspects	Score (f)	Maximum Shoes
Material Suitability	10	12
Presentation of Materials	6	8
Language	8	8
Media Display	8	8
Interactivity	9	12
ease of use	7	8
Media Eligibility	3	4
Quantity	51	60
Percentage	85%	
Category	"Very Practical"	

The results presented in Table 7 show that teachers' responses to NIBIT FIRE reached 85%, placing the media in the "Very Practical" category. These findings show that NIBIT FIRE is easy to use and suitable for supporting place-value learning. The positive responses of students and teachers show that NIBIT FIRE is acceptable as an engaging and easy-to-use learning medium. For students, interactivity, visualization, and game challenges can increase engagement in learning, while for teachers this media can be an alternative to provide variety in mathematics learning. In addition, the fifth stage, namely evaluation, is the last stage in the ADDIE development model. In this stage, the researcher evaluates the NIBIT FIRE learning media based on the results of validation and user responses during the implementation process. The evaluation is carried out to find out the shortcomings that still exist in the media so that improvements and improvements can be made according to learning needs. Input from media experts and material experts is used to improve several parts of the media, such as visual appearance, material presentation, language use, and completeness of visualization to better suit the characteristics of grade III students. The results of the evaluation are the basis for perfecting NIBIT FIRE before it is used as a learning medium.

NIBIT FIRE was developed as an interactive learning medium to support place value learning in grade III elementary school students. This media combines the presentation of concepts, visualizations, game activities, challenges, and feedback in one learning environment. These characteristics are in accordance with grade III students who still need concrete, visual, and hands-on learning experiences. In place value materials, visualization of the position of units, tens, hundreds, and thousands can help students connect the position of digits with the values they represent.

Meanwhile, game activities provide opportunities for students to be actively involved in completing tasks, while challenges and feedback can encourage students to try, pay attention to mistakes, and continue learning activities. Thus, NIBIT FIRE's characteristics have the potential to support student involvement and motivation during the learning process without making games just an entertainment activity.

The use of Construct 3-based educational games in mathematics learning has also been reported by Anggoro et al., (2024), Fachrurroji et al., (2025), and Oula et al., (2024). The research shows that Construct 3 can be used to develop interactive mathematics learning media. The results of this study expand the use of educational games in place value materials by integrating the presentation of game concepts and activities in one learning flow. Interactive media can also encourage active participation of students and help in understanding abstract and difficult to visualize mathematical concepts (Juraidah et al., 2025). In addition, the development of interactive media needs to pay attention to the aspects of validity and practicality so that the media can be used in learning (Saa'dah et al., 2025). In the context of NIBIT FIRE, interactivity, challenges, and feedback provide a space for students to actively participate and gain a more engaging learning experience in learning place value.

The characteristics of NIBIT FIRE also have implications for mathematics learning practices in elementary schools. Teachers can use this media as a companion in introducing concepts, providing exercises, and creating more interactive learning activities. The use of games can provide a variety of learning centered on the delivery of written materials and exercises, while providing opportunities for students to learn through more active and interesting activities. However, its use still needs to be adjusted to learning goals, student characteristics, time, and school facilities. Thus, NIBIT FIRE can be an alternative learning media for place value that combines visualization, game activities, and student involvement in the learning process. The implementation of NIBIT FIRE still faces limitations in the form of the number of Chromebooks available and an unstable internet connection. Although media can be accessed via mobile phones, students are not allowed to bring mobile devices to school so their use is adjusted to the available facilities. This condition shows that the implementation of digital-based educational games is also influenced by the readiness of devices and networks in schools. Therefore, the availability of devices and network stability need to be considered in the application of NIBIT FIRE in learning activities. This condition also needs to be considered in the application of media in schools with different technological facilities.

4. Conclusion

Based on the results of the research, NIBIT FIRE was successfully developed as a Construct 3 based educational game for learning place values in third grade students of SD Negeri 002 Samarinda Kota through the stages of analysis, design, development, implementation, and evaluation. This media integrates place value

material with visualization of unit positions, tens, hundreds, and thousands, learning materials, three levels of games with different challenges, and feedback on student responses. Based on the results of the research, NIBIT FIRE meets the feasibility and practicality criteria, so that the research goal of producing a decent and practical learning media has been achieved.

The success of the development of NIBIT FIRE is shown through the integration of place value materials with game activities designed according to the characteristics of grade III students. NIBIT FIRE provides alternative learning that combines the presentation of materials, visualization of concepts, and interactive activities in one medium. However, its implementation still has limitations in the form of the availability of Chromebook devices and the stability of internet connections in schools. This study has also not tested the effectiveness of NIBIT FIRE on student learning outcomes. Therefore, NIBIT FIRE can be used as an alternative learning medium for place values, while further research can test its effectiveness through wider application.

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How to cite this article:

Rusvita, Y., Sukriadi., Hidayat, T., Makmun., & Ibrahim, M. M. M. (2026). Development of NIBIT FIRE Educational Game Based Learning Media for Grade III Elementary School on Place Value Material. *Journal of Educational Sciences*, 10(10), 210-226.
