



# Development of learning comic with Banjar culture on two variable linear equations system

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## ARTICLE INFO

**Keywords:**  
Development;  
Learning Comic;  
Banjar Culture;  
Two Variable Linear Equation System

## ABSTRACT

Students experience difficulties in translating information presented in problem-solving tasks into appropriate mathematical models. Therefore, learning media are needed to help students solve problem-solving tasks more easily and contextually. This study aims to describe the development process, validity, and practicality of a Banjar Culture-based learning comic on the topic of a system of linear equations in two variables (SLETV). This study employed the Research and Development (R&D) method using the ADDIE model, which consists of five stages Analysis, Design, Development, Implementation, and Evaluation. The research instruments consisted of validation and practicality sheets. The validation sheet was assessed by three validators, consisting of a lecturer experienced in developing mathematics learning comics, a mathematics teacher who teaches eighth-grade students, and a lecturer experienced in Banjar Culture-based research. The practicality sheet was completed by 22 students and one mathematics teacher. The data were analyzed using descriptive qualitative and descriptive quantitative techniques. The qualitative data were analyzed based on the comments and suggestions provided by the validators as a basis for product revision, while the quantitative data were analyzed using percentage scores to determine the levels of validity and practicality. The results showed that the comic obtained a validity score of 89.52%, categorized as very valid, and a practicality score of 94.45%, categorized as very practical. Therefore, the Banjar Culture-based learning comic was considered valid and practical and can be used in the learning process as well as for independent learning.

## 1. Introduction

Mathematics is a discipline that is widely applied in various aspects of life [1]. As a fundamental science, mathematics serves as a foundation for studying and mastering various other fields of knowledge [2]. Mathematics also plays an important role as a means of conveying information through numbers and symbols. Furthermore, learning mathematics helps students think logically, creatively, and critically when solving various problems [3]. However, many students perceive mathematics as a difficult and boring subject that instills fear [4]. This perception can affect students' engagement in learning, which in turn impacts their problem-solving skills.

Meanwhile, problem-solving skills are important because they help students understand and apply

mathematical concepts [5]. These skills must be supported by a solid conceptual understanding so that students can grasp definitions, determine problem solving methods, and use mathematical operations correctly [6]. Issues with problem-solving skills are also evident in the results of the 2022 Programme for International Student Assessment (PISA). Only about 18% of Indonesian students reached Level 2. Level 2 represents the basic competency level in using mathematics to solve simple problems in daily life. Meanwhile, about 82% of students have not yet reached that level. This situation indicates that Indonesian students' mathematical problem-solving skills still need to be improved.

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In line with this, based on observations of 22 eighth grade students at MTs Muhammadiyah 3 Al-Furqan, it was found that the students experienced difficulties in solving problem-solving questions or word problems on the topic of linear equations through two points. These difficulties were evident when the students determined the coordinates of the given points, as they made errors in determining the  $x$  and  $y$  values for those points. Errors in determining the coordinates of the points caused the mathematical models they constructed to not match the information provided in the problems. This situation indicates that the students still face challenges in understanding the given information and translating it into mathematical models.

A topic in mathematics that requires mathematical modeling skills is systems of linear equations with two variables (SLETV). This topic is generally presented in contextual word problems, so students need to understand the problem and solve it using mathematical concepts [7]. However, students still face challenges in understanding the problems, constructing mathematical models, and applying the appropriate solution methods [8]. Therefore, teaching materials are needed that can help students solve SLETV problems more easily and in a contextual manner. Comics are a medium that can help students solve SLETV problems more easily and in a contextual manner. Comic media is a medium that combines images and text within an interconnected storyline, allowing messages to be conveyed clearly and helping create a more meaningful learning experience [9, 10]. Through the narrative presented, comics can help students identify known and unknown information, determine variables, formulate mathematical models, and understand the step-by-step process for solving SLETV problems. In the classroom, comics can also be used as a teaching aid for teachers as well as a self-learning tool for students [11]. Comics can also make the learning process more engaging [12]. The use of comics is also considered practical because it does not require many special tools or resources, making it easy to incorporate into teaching and learning activities [13]. Comics offer many benefits for students, including enriching vocabulary, stimulating imagination, improving memory, helping them comprehend reading material more quickly, instilling character values, and fostering an interest in writing and academic achievement. In addition, the varied presentation of stories in comics can train students' thinking skills and help them understand the material comprehensively [14].

In addition, comics can be presented in print form. Print media can enhance students' comprehension, concentration, and engagement because it provides a more focused, structured learning experience with minimal distractions [15]. Based on these characteristics, printed comics can be used in the classroom because they help students focus more on understanding the material and serve as a solution for schools that do not yet allow the use of smartphones.

Various studies have developed comics as mathematics

learning media with diverse characteristics. A learning comic designed to support the mathematical problem solving abilities of eighth-grade junior high school students was developed using the ADDIE model and resulted in valid and practical media [16]. An ethnomathematics-based comic on quadrilaterals and triangles was developed using the Plomp model by incorporating the context of Jami Sungai Jingah Mosque in Banjarmasin for geometry learning; however, it had not yet been implemented [17]. Meanwhile, an ethnomathematics-based comic on systems of linear equations in two variables was developed using the 4-D model by incorporating the culture of the Floating Market and resulted in valid and practical media for junior high school mathematics learning [18].

These three studies demonstrate that comics can be used as mathematics learning media to support students' problem-solving abilities and connect mathematical content with local culture. However, these studies are still limited to specific environmental contexts, and the comic dialogues generally use Indonesian. Meanwhile, the use of regional languages is also important as an effort to preserve local culture. If not continuously preserved, regional languages in Indonesia are at risk of extinction [19]. Therefore, the novelty of this study lies in the use of the Banjar language in the dialogue between characters and the use of Cahaya Bumi Selamat (CBS) Martapura as the setting. The problems presented in the comic incorporate local products, such as bracelets, brooches, Sasirangan T-shirts, and Sasirangan caps. The use of these cultural elements is expected to make the comic a contextual learning medium while introducing and preserving Banjar culture in mathematics learning. Based on the above discussion, this study aims to describe the development process, validity, and practicality of a learning comic incorporating Banjar culture for the topic of SLETV.

## 2. Method

### 2.1. Research design

This study employed the Research and Development (R&D) method, which aims to develop and test a product, including its validity and practicality, in the field of education [20]. The development model used was Analysis, Design, Development, Implementation, and Evaluation (ADDIE). The ADDIE model is a systematic and structured instructional design model with interconnected stages that are oriented toward students' needs [21]. This model was selected because it aligns with the objectives of the study, namely to describe the development process, validity, and practicality of a learning comic incorporating Banjar culture for the topic of SLETV.

### 2.2. Research Setting and Participants

This study was conducted at MTs Muhammadiyah 3 Al-Furqan, from January to May 2026. The research subjects consisted of expert validators and trial participants. The expert validators consisted of three experts: a media expert, a material expert, and an ethnomathematics expert.

- 1) The media expert: was a lecturer with experience in developing mathematics learning comics.
- 2) The material expert: was a mathematics teacher who teaches Grade VIII.
- 3) The ethnomathematics expert: was a lecturer with experience in research based on Banjar Culture.

The selection of validators was based on the relevance of their expertise and experience to the product being developed. The comments and suggestions provided by each validator were grouped according to the aspects of the product requiring improvement and were then used as a basis for revising the product before the trial stage.

The trial subjects were divided into two groups: a limited trial and a field trial [22].

- 1) Limited trial: involved 6 ninth-grade students, consisting of 2 students with high academic ability, 2 with moderate academic ability, and 2 with low academic ability. The selection of students with diverse academic abilities aimed to obtain an overview of the media's readability across different levels of student ability. The limited trial was conducted to determine the readability of the comic before its use in the field trial.
- 2) Field trial: involved 22 eighth-grade students from Class VIII D and 1 mathematics teacher. Eighth-grade students were selected because SLETV is included in the learning materials for this grade level. The field trial aimed to determine the practicality of the comic in mathematics learning. The mathematics teacher was involved to assess the practicality of the media from the educator's perspective, while the students provided assessments based on their experience using the comic during learning.

### 2.3. Research Procedure

The research procedure was carried out through five stages, namely:

- 1) The analysis stage was conducted as the initial step to identify needs and formulate an overview of the learning media to be developed [23]. In this study, the analysis focused on two activities: needs analysis and curriculum analysis. The needs analysis was conducted by distributing questionnaires to teachers and students to identify their needs for learning media. Meanwhile, the curriculum analysis was conducted through interviews with a mathematics teacher to obtain information regarding the curriculum, learning outcomes, learning objectives, and learning materials relevant

to the product to be developed.

- 2) The design stage involved planning the concept of the product to be developed, including the learning media and learning components [23]. In this study, the design activities included preparing the learning materials, developing the comic storyline, and designing the comic media.
- 3) The development stage involved transforming the product design into learning media and validating it by experts [23]. At this stage, the comic design was developed and printed as an initial product in the form of Draft 1. Subsequently, Draft 1 was validated using validation sheets by a media expert, a material expert, and an ethnomathematics expert.
- 4) The implementation stage involved using the developed product in the learning process [23]. At this stage, a limited trial was conducted involving six Grade IX students with heterogeneous abilities. Subsequently, a field trial was conducted during the learning process with 22 Grade VIII students and one mathematics teacher.
- 5) The evaluation stage was conducted at the end of each stage of the development process [23].

### 2.4. Instruments and Data Collection

The research instruments consisted of validation sheets and a practicality sheet. The validation sheets were provided to three validators, namely a media expert, a material expert, and an ethnomathematics expert. The practicality sheet was provided to the teacher and students. The instruments used a four-point Likert scale, with 1 indicating strongly disagree, 2 indicating disagree, 3 indicating agree, and 4 indicating strongly agree [24]. The aspects assessed by the media expert included cover design, text design, image design, and visual presentation. The material expert assessed the material and language aspects, while the ethnomathematics expert assessed the suitability of Banjar Culture and the quality of the content. The practicality of the comic was assessed by the teacher and students based on the aspects of appearance and text, material, language, and the attractiveness of the learning comic.

### 2.5. Data Analysis

The research data consisted of qualitative and quantitative data. The qualitative data were analyzed descriptively based on the comments and suggestions provided by the validators. These inputs were used to identify aspects of the product that needed improvement and served as a basis for revising the comic. The quantitative data were analyzed using descriptive quantitative analysis. The quantitative data were obtained from validation sheets completed by the media expert, material expert, and ethnomathematics expert, as well as practicality sheets completed by the teacher and students. The scores for each item were summed to obtain the total

score obtained. The total score was then compared with the maximum possible score to determine the percentage score. The percentage score was calculated using the following formula [25]:

$$\text{Percentage score} = \frac{\text{Total score obtained}}{\text{Maximum possible score}} \times 100\%$$

For the validation data, the scores from the three validators were used to determine the validity of the comic. Meanwhile, the practicality data obtained from the teacher and students were used to determine the practicality of the comic. The resulting percentages were then classified based on the following criteria [26]:

- a) 0% – 20%: very invalid/not practical
- b) 21% – 40%: less valid/less practical
- c) 41% – 60%: moderately valid/moderately practical
- d) 61% – 80%: valid/practical
- e) 81% – 100%: very valid/very practical

These criteria were used as a reference for determining the validity and practicality of the product. The comic was considered valid/practical if the validation/practicality results fell within the range of 61% – 100% [26].

### 3. Results and discussion

The product developed was a printed comic entitled “Petualangan Memecahkan Teka-Teki SPLDV di Pertokoan Cahaya Bumi Selamat Martapura”, focusing on the SLETV topic, particularly the subtopic of solving problems related to SLETV. The following are the stages involved in the development of the learning comic:

#### 3.1. Analysis Stage

The analysis stage was conducted to identify the needs for teaching materials and to determine the alignment of the curriculum and learning materials with the product to be developed [27]. This stage consisted of two activities needs analysis and curriculum analysis.

##### 1. Needs analysis

The needs analysis was conducted through questionnaires administered to teachers and students. The teacher needs questionnaire was administered to eight mathematics teachers representing schools in South Kalimantan. The results of the teacher needs questionnaire are presented in Table 1.

Based on Table 1, the results of the teacher needs questionnaire indicate that textbooks are still commonly used as learning media in mathematics instruction. All teachers also reported experiencing limited time to develop learning media. Although some teachers had incorporated Banjar Culture into their teaching, none of the teachers had previously used comics featuring Banjar Culture. In addition, the teachers responded positively to the development of comics incorporating Banjar Culture, and most teachers recommended the subtopic of solving problems related to SLETV for development.

**Table 1**

Results of the Teacher Needs Analysis

| Indicator                                                                  | Frequency (n) | Percentage (%) |
|----------------------------------------------------------------------------|---------------|----------------|
| Use textbooks as learning media                                            | 8             | 100            |
| Experience limited time to develop learning media                          | 8             | 100            |
| Have used Banjar Culture in learning                                       | 3             | 37,5           |
| Have never used comics incorporating Banjar Culture                        | 8             | 100            |
| Agree with the development of comics incorporating Banjar Culture          | 5             | 62,5           |
| Strongly agree with the development of comics incorporating Banjar Culture | 3             | 37,5           |
| Recommend the subtopic of solving involving SLETV for development          | 7             | 87,5           |

Meanwhile, the student needs questionnaire was administered to 58 students representing Grades VIII and IX from three schools in South Kalimantan. The results of the student needs questionnaire are presented in Table 2.

Based on Table 2, the results of the student needs questionnaire indicate that students have a fairly positive interest in reading activities and comics. However, some students still experience difficulties in solving problems related to everyday life. Students also prefer problems that can be solved directly using formulas, as well as illustrations accompanied by clear solution steps. In terms of cultural context, students showed interest in stories featuring Banjar Culture and recommended the use of traditional clothing or fabrics, as well as traditional accessories and handicrafts from South Kalimantan, as learning contexts. These findings were taken into consideration in developing a learning comic that incorporates Banjar Culture and presents the steps for solving SLETV problems systematically.

**Table 2**

Results of the Student Needs Analysis

| Indicator                                                                        | Frequency (n) | Percentage (%) |
|----------------------------------------------------------------------------------|---------------|----------------|
| Like reading books during their free time                                        | 39            | 67,2           |
| Like reading comics                                                              | 34            | 58,6           |
| Find it easier to understand problems that can be directly solved using formulas | 46            | 79,3           |

|                                                                            |    |      |
|----------------------------------------------------------------------------|----|------|
| Have difficulty solving problems related to everyday life                  | 30 | 51,7 |
| Like stories incorporating Banjar Culture                                  | 30 | 51,7 |
| Like illustrations accompanied by clear solution steps                     | 43 | 74,1 |
| Recommend the use of traditional clothing or fabrics as a cultural context | 34 | 58,6 |
| Recommend the use of accessories or traditional crafts from Kalimantan     | 34 | 58,6 |

## 2. Curriculum analysis

From an interview with a mathematics teacher at MTs Muhammadiyah 3 Al Furqan, it was learned that the learning outcomes used are that students can solve systems of linear equations with two variables using various problem-solving methods. The learning objectives used are that students can solve everyday problems related to SLETV. The curriculum implemented at the school is the Merdeka Curriculum with a "Love-Based Curriculum" approach. The textbook used is Mathematics for Grade VIII by Wono Setya Budhi et al. The Merdeka Curriculum includes material on SLETV, which covers the subtopic of solving problems related to SLETV.

### 3.2. Design Stage

The results of the needs analysis were used as a basis for designing the learning comic. The design process included preparing the learning materials, developing the storyline, and designing the comic's visual appearance. The selected topic was solving problems involving SLETV, based on the recommendations and needs identified from the students, and was developed in accordance with the predetermined learning outcomes and objectives. The Banjar cultural elements incorporated into the comic included traditional accessories from South Kalimantan, as well as traditional clothing or fabrics. The storyline and visual design were also developed by considering students' preference for illustrations and clear, step-by-step solution explanations.

#### 1. Design of Learning Materials

The learning comic focuses on solving problems involving SLETV. The material was developed based on the predetermined learning outcomes and learning objectives. It covers the definition of SLETV, worked examples with solution steps using the mixed method, which combines substitution and elimination, and practice exercises.

#### 2. Design of the Comic Storyline

The storyline features two male characters who visit

the CBS shopping area. They first visit a traditional South Kalimantan accessories store to purchase bracelets and brooches and then pay for their purchases. They continue to a Sasirangan store to buy T-shirts and caps before paying for the selected items. On their way home, they have difficulty determining the unit prices of the items based on the total amount they paid. After arriving home, they ask their parents about the unit prices. They then study the learning materials presented in the comic together, including an introduction to the topic, an explanation of SLETV, worked examples using the mixed method, a summary of the material, and practice exercises.

#### 3. Design of the Learning Comic

The learning comic was designed using Canva and IbisPaint X. Canva was used to create the cover, characters, page layout, fonts, comic panels, and speech bubbles. The page layout included the preface, learning outcomes and objectives, character introduction, introduction to CBS, and glossary. Meanwhile, IbisPaint X was used to create the background illustrations of the settings based on the storyline.

### 3.3. Development Stage

At the development stage, the storyline, setting, and other designed components were combined and arranged using Canva to produce the learning comic. The comic was then exported in PDF format and printed as the initial product (Draft 1). The initial product, along with the validation sheets, was subsequently submitted to three validators for assessment. The validators consisted of one media expert, one content expert, and one ethnomathematics expert. The media expert was a lecturer with experience in developing mathematics learning comics and assessed the cover design, text design, illustration design, and visual presentation. The content expert was a mathematics teacher who taught Grade 8 and assessed the content and language aspects. The ethnomathematics expert was a lecturer with experience in research involving Banjar Culture and assessed the cultural appropriateness and content quality of the comic.

### 3.4. Implementation Stage

This stage consisted of a limited trial and a field trial. The limited trial involved 6 Grade 9 students to assess the readability of the learning comic. In this activity, the students read the learning comic and then completed the readability questionnaire. The readability results are presented in Table 3.

**Table 3**  
Readability Test Results

| Score Obtained | Maximum Score | Percentage |
|----------------|---------------|------------|
| 306            | 336           | 91%        |

As shown in Table 3, the readability percentage was calculated by comparing the obtained score with the maximum possible score and multiplying the result by 100%. The calculation yielded a readability percentage of 91%. Based on the readability criteria used in this study, a percentage of 80.1% – 100% is classified as very good [28]. Therefore, the learning comic achieved a readability score of 91%, which falls into the very good category.

Subsequently, the field trial involved 22 students and one mathematics teacher. During this stage, the learning comic was used in classroom instruction on the subtopic of solving problems related to SLETV. After the learning activity was completed, all students and the teacher completed a practicality questionnaire covering the aspects of visual presentation and text, content, language, and the attractiveness of the learning comic. The assessment scores from the students and teacher were calculated separately to obtain their respective practicality percentages. The practicality percentages from the students and teacher were then combined to determine the overall practicality percentage. The use of the comic is presented in Fig. 1.



**Fig. 1.** Use of the Learning Comic

### 3.5. Evaluation Stage

An evaluation phase is conducted at the end of each stage, from the analysis, design, and development stages through to implementation. As a result, the educational comics produced have been refined through the evaluation process at each stage.

**Table 4**  
validity Test Results

| Validator                | Score Obtained | Maximum Score | Percentage |
|--------------------------|----------------|---------------|------------|
| Media Expert             | 75             | 76            | 98,68%     |
| Content Expert           | 39             | 48            | 81,25%     |
| Ethnomathematics Expert  | 39             | 44            | 88,64%     |
| Overall Percentage Score |                |               | 89,52%     |

Based on Table 4, the validity assessment conducted by the three validators resulted in a score of 89.52%, which was classified as very valid. This percentage was obtained by averaging the assessment percentages from the media expert, content expert, and ethnomathematics expert by summing the percentages from the three validators and dividing the total by three. Based on these results, the learning comic was considered valid for implementation.

The validators also provided comments and suggestions for improvement. The media expert suggested replacing the original store names used in the settings and adding page numbers. The content expert recommended revising several number representations that were not yet appropriate. Meanwhile, the ethnomathematics expert suggested revising the cover and learning outcomes, adding terms to the glossary, improving the storyline, and revising the representation of the products used in the examples [29-35].

**Table 5**  
Field Trial Results

| Respondent               | Score Obtained | Maximum Score | Percentage |
|--------------------------|----------------|---------------|------------|
| Media Expert             | 1330           | 1496          | 88,9%      |
| Content Expert           | 72             | 72            | 100%       |
| Overall Percentage Score |                |               | 94,45%     |

Based on Table 5, the practicality assessment from the students resulted in a percentage of 88.9%, while the teacher's assessment resulted in 100%. The assessments from the students and teacher were given equal weights, with each contributing 50% to the overall practicality score. Thus, the overall practicality percentage was 94.45%, which was classified as very practical [36].

The validity and practicality test results indicated that the learning comic was valid and practical for use. Therefore, the final product was developed with several components, including a cover, preface, learning outcomes and objectives, character introduction, an introduction to CBS, comic stories containing explanations of SLETV, worked examples, exercises, a glossary, and an answer key. Several parts of the learning comic are presented in the following Fig. 2.

As shown in Fig. 2, Banjar cultural elements are incorporated into the comic cover through the Calligraphy Monument and the CBS inscription.



Fig. 2. Comic Cover



Fig. 4. CBS Store Setting

Fig. 3 presents an introduction to CBS Martapura, including information about CBS, the original Al-Fatihah inscription, the original Calligraphy Monument, and the location of CBS.



Fig. 3. Introduction to CBS

As shown in Fig. 4, Banjar cultural elements are presented through the CBS shopping area setting, which depicts the atmosphere of the shopping area.



Fig. 5. Sasirangan Store Setting

As shown in Fig. 6, the word problem solution is presented through dialogue between the characters, explaining the solution steps in a systematic sequence.



## Glosarium

|                                                                       |                                                       |
|-----------------------------------------------------------------------|-------------------------------------------------------|
| - Arif/yli: kebutuhan untuk pemenuhan-<br>desanya / penjual pemenuhan | - Kadada: tidak ada                                   |
| - Adig: camilan pemenuhan/adik                                        | - Hah/fah: kata tanya (pangus<br>pertanyaan)          |
| - Ase: dah / dah                                                      | - Hasepa: kasepa                                      |
| - Asepa: punya / milik                                                | - Kasefah: kasefah / bijah                            |
| - Begumutan: jalan-jalan                                              | - Karyana: separtina                                  |
| - Beinhahan: beres-beres                                              | - Raryana: hargimana                                  |
| - Bana: sangat / sekali                                               | - Heteja: ada                                         |
| - Berjalan: berjalan-jalan                                            | - Homanan: homan                                      |
| - Berjaka: memakai keryit                                             | - Kaplita: pusi                                       |
| - Bolidah: melihat-lihat                                              | - Lahat: segana / segat                               |
| - Bataha: bertanya                                                    | - Lashan: lama                                        |
| - Blak: ada / asamilik                                                | - Lawan: dengan                                       |
| - Bajan: benar                                                        | - Lihah: lihat                                        |
| - Baka: manka                                                         | - Mamakah: mamakai                                    |
| - Bagan: cantik                                                       | - Mamilik: asamilik                                   |
| - Bala: salah                                                         | - Membawa: mengajik                                   |
| - Bihari: dibuktikan                                                  | - Menakahi: membati tahu /<br>menginformasikan        |
| - Bula: dibat / dibat                                                 | - Mekar / Mekar: Tukan: mankai                        |
| - Dua huting: dua buah / dua benda                                    | - Mengat: manan                                       |
| - Dali: uang                                                          | - Madaka: omang                                       |
| - Egeh: sangat                                                        | - Wang: yang (kata penghubung/jarak)                  |
| - Galang: galang                                                      | - Nuhakan: membikin                                   |
| - Gama: untuk                                                         | - Pasi: Ada (untuk orang yang lebih<br>tua/dihormati) |
| - Handa: ingit / mau                                                  | - Sabeting: satu buah / satu benda                    |
| - Hanga: kera                                                         | - Seleja: selakian                                    |
| - Hant kama (untuk luman nahan)                                       | - Sidi: lida                                          |
| - Hahid: lukan                                                        | - Tu: itu                                             |
| - Hah: kera (kata "kaka" atau<br>permainan)                           | - Tuntugahan: selakian                                |
| - Jara: jara / kupa                                                   | - Ulu: apa (kata orang yang lebih<br>tua/dihormati)   |
| - Jaja-jaja                                                           | - Ulu: cerita                                         |
| - Kade: Tidak                                                         |                                                       |

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As shown in Fig. 8, the glossary is provided to help students understand the Banjar language used in the learning comic.



**Tentang Penulis**



Yunita lahir di Penyambarn pada 17 Februari 2004. Ia menempuh pendidikan dasar di SDN Penyambarn 2 dan lulus pada tahun 2016, kemudian melanjutkan pendidikan di MTsN 5 Banjar dan lulus pada tahun 2019, serta menyelesaikan pendidikan menengah di MA Sultan Soleiman pada tahun 2022.

Keterlariannya pada dunia pendidikan mendorong Yunita melanjutkan studi di Program Studi Pendidikan Matematika, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Muhammadiyah Banjarmasin. Selama masa perkuliahan, ia tidak hanya belajar tentang matematika, tetapi juga belajar memahami cara membuat pembelajaran yang lebih menarik dan dekat dengan kehidupan peserta didik.

Melalui karya tugas akhir ini, Yunita menghadirkan komik pembelajaran dengan kearifan lokal budaya Banjar. Komik ini dirancang secara sistematis dan menyenangkan dengan harapan dapat membantu peserta didik memahami materi pembelajaran dengan lebih mudah sekaligus menumbuhkan kecintaan terhadap budaya daerah.

Scan disini



Kunci jawaban latihan soal

Fig. 9 provides an answer key for the practice exercises, allowing students to check their answers and supporting independent learning. In addition, based on the researcher's observations during the field trial, students showed interest in the learning comic. This interest was reflected in their focus while reading the comic, understanding the material presented, and actively discussing the examples with their peers. This finding is

consistent with a study stating that comics can also support students' learning interest [29-40]. The use of comics has also been reported to encourage students who tend to be passive to become more engaged in reading and discussion [30]. Comics are not merely entertainment media but can also serve as supporting media in learning [41-52]. Thus, the developed comic can serve as a learning support for SLETV by integrating the material with the context of Banjar Culture in accordance with students' needs.

This learning comic has several advantages. The examples are presented through conversations between characters that include explanations of the steps for solving the problems, making them easier to understand. The comic also uses CBS Martapura as the setting, while the dialogues use the Banjar language as an effort to introduce Banjar Culture to students. In addition, the comic is available in printed form, making it easy to use without electronic devices, and it can be studied independently because it includes an answer key at the end.

#### 4. Conclusion

The product developed was a printed comic entitled "Petualangan Memecahkan Teka-Teki SLETV di Pertokoan Cahaya Bumi Selamat Martapura", focusing on the SLETV topic, particularly the subtopic of solving problems related to SLETV. The comic uses the Banjar language in the dialogues between characters, with CBS Martapura as the setting, and presents example problems through a storyline and step by-step solution procedures. The comic was developed using the ADDIE model, which consists of five stages analysis, design, development, implementation, and evaluation. At the analysis stage, needs analysis and curriculum analysis were conducted. The design stage involved the preparation of the learning materials, storyline, and media design. The development stage involved transforming the design into a product and validating it by a media expert, a material expert, and an ethnomathematics expert. The implementation stage was conducted through a limited trial and a field trial, while evaluation was conducted at the end of each development stage.

The validation results showed scores of 98.68% from the media expert, 81.25% from the material expert, and 88.64% from the ethnomathematics expert. The overall validation score was 89.52%, which was categorized as very valid. The practicality test obtained scores of 88.90% from the students and 100% from the teacher, with an overall practicality score of 94.45%, which was categorized as very practical. Thus, the Banjar Culture-based learning comic was declared very valid and very practical and can be used in the learning process as well as for independent learning.

The limitation of this study lies in the scope of the material, as the developed comic only covers the subtopic of solving problems related to SLETV. In addition, this study did not include an effectiveness test of the product. Therefore, future research may develop a comic that covers all SLETV subtopics so that students can gain a more comprehensive understanding of SLETV concepts, as well as conduct an effectiveness test to determine the effectiveness of the Banjar Culture-based comic in supporting the learning process.

#### CRedit authorship contribution statement

Yunita: Conceptualization, Methodology, Software, Investigation, Data curation, Formal analysis, Writing – original draft. Rahmatya Nurmeidina: Supervision, Validation, Writing – review & editing, corresponding author. Soraya Djamilah: Supervision, Validation, Writing – review & editing.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

#### Acknowledgment

The authors would like to express their deepest gratitude to MTs Muhammadiyah 3 Al-Furqan Banjarmasin for granting permission, providing support, and offering the opportunity to conduct this research. The authors would also like to thank the media experts, subject matter experts, and ethnomathematics experts who provided guidance, advice, and feedback during the product validation process. The authors also extend their gratitude to all students who participated in the pilot test and field test, enabling this research to be successfully carried out.

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