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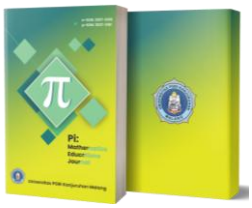

Integrating Students' Creative Soft Skill In Mathematics Learning Media Development

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ABSTRACT
The purpose of this study was to determine the integration of students' creative soft skills in developing mathematics learning media. This type of research is descriptive qualitative. The subjects of this study were groups of 4 fifth-semester students of the Mathematics Education Study Program, PGRI Jombang University. The instruments used were creativity observation sheets and interview guidelines. Data collection techniques used observation and interviews. Data analysis techniques consisted of reducing data from the observation sheets and interviews. Then presenting the collected data for analysis and drawing conclusions. The results of the study showed that creativity was reflected in three aspects: originality, flexibility, and fluency in developing learning media. Students were able to produce innovative media concepts, develop ideas, and design according to students' needs. These three aspects of creativity indicate that student creativity is able to develop innovative and meaningful learning media. Strengthening creativity prepares teachers to be more responsive to students' learning needs.

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1. Introduction

Creativity is one of the essential competencies for prospective educators in the 21st century. As future teachers, students are required not only to understand learning materials but also to develop innovative, engaging, and effective learning media to support the teaching and learning process. Creative learning media can facilitate various learning styles, foster interest in learning, and help students grasp concepts more deeply. Learning media can help improve the effectiveness of the learning process through more interactive and engaging methods [1]. Through learning media, students will be motivated to be active in discussions and doing assignments so that the learning process can run effectively and efficiently [2]. One of the problems in learning mathematics is related to student activity in class, because student activity in learning has an important role [3]. Factors contributing to these problems include the use of conventional learning media, limited variety of learning

media, and a lack of interaction between teachers and students. Interactive learning media not only presents material in a visually appealing manner but also provides opportunities for students to actively participate in the learning process [4].

Creativity is the ability to find many possible answers to a problem, where the emphasis is on quantity, usefulness and diversity of answers [5]. Creativity in learning media focuses not only on visual design but also on the teacher's ability to package material innovatively, making it easy to understand and increasing student participation. Creativity in learning media is necessary because mathematics is a complex and abstract subject, requiring teachers to possess the skills or soft skills to convey the material to students. According to [6] *Soft skills* are life skills and abilities, both for oneself (intrapersonal) and in groups or society (interpersonal). Developing a model of students' intrapersonal and interpersonal skills in mathematics learning can help achieve comprehensive mathematics learning goals [7]. According to [8], *Soft skills* can support the strength of hard skills, thus simultaneously leading to improved quality for a student through the learning process. Several aspects and indicators of *soft skills* according to [9] verbal mathematical communication, nonverbal mathematical communication, creativity, critical thinking, problem solving, stress management, collaboration and time management. [9] Teachers develop *soft skills* so they can provide examples to students, the quality and abilities of teachers are the most important aspects in student achievement and abilities.

Creativity is a person's way of thinking divergently in solving a problem with various alternative answers to new problems to get a new concept [10]. Student creativity in media development can be seen from three main aspects: originality, flexibility, and fluency. These three aspects complement each other and form a complete creative thinking ability in the educational context. The fluency aspect is the student's ability to generate ideas, design choices, or solutions in creating media. Students who have fluency in thinking will actively provide additional ideas during the discussion process and media design development. Students are fluent in systematically compiling content and displays according to learning objectives. The flexibility aspect can be seen from the student's ability to move from one medium to another, looking at it from different media perspectives [11]. Students' ability to adapt learning media to their learning needs and learning styles will be easily understood by students through images (visual), explanations (auditory), or physical activity (kinesthetic). Student flexibility is also reflected in their ability to modify media designs to suit the learning context.

The aspect of originality is related to students' ability to produce new, unique or updated media compared to previously existing media. This is in line with research [12]. Students' ability to generate new ideas and design media that are not commonly used makes them possess a high level of originality and are able to create learning media concepts that are relevant to students' needs. Therefore, with the rapid development of existing technology, teachers and students must have innovation in the mathematics learning process. The need for creativity in learning media is a crucial aspect in improving the quality of the teaching and learning process. Creative learning media is expected to create a more interesting learning atmosphere, motivate, and provide a richer learning experience for students. In creating teaching aids, students often encounter problems related to creativity, which is demonstrated by the presentation of ideas, material selection, and presentation of learning media.

Previous research has integrated technology in the development of learning media. In line with this research [13] that IT integration cannot be separated from the process of improving the quality of education as a whole, especially in preparing teachers as educators more broadly and the integration of the context of cultural wisdom in mathematics learning not only teaches mathematical skills, but strengthens cultural identity, this is in line with his

opinion [14]. Studies on the integration of soft skills and creativity in developing mathematics learning media are still limited, particularly regarding the integration of soft skills and creativity. Therefore, this study aims to determine the integration of students' soft skills and creativity in developing mathematics learning media.

2. Methods

The research approach used was qualitative research with descriptive methods. The findings are based on the researcher's analysis of student creativity in learning media. Descriptive research is a method used to describe and analyze research results, but it is not used to draw precise final conclusions [15]. Qualitative research is effectively used to understand social phenomena in the context of education [16]. The focus of this research is to describe the extent of students' creative soft skills in developing learning media. The research was conducted on mathematics education students taking the learning media course at PGRI Jombang University. The research subjects were group 4 fifth-semester students taking the instructional media course. Subject selection was based on purposive student sampling.

The research instruments consisted of observation sheets, interview guidelines, and a recording device. The researchers developed the observation sheets and interview guidelines for the study. The observation sheets and interview guidelines were validated by expert validators and declared suitable for use in obtaining data on student creativity in learning media. Data was obtained through in-depth observations and interviews. This study utilized time triangulation to validate the data, as it involved at least two meetings with different subjects and at different times. The study began with the creation of learning media and presentations. The researcher then conducted interviews after each observation to gather insights from the results. The data analysis phase began with the researcher reducing the observation data by compiling all data on student creativity obtained from the observation sheets and interviews. The collected data was then presented for analysis and conclusion drawing.

Table 1. Indicators of Student Creativity in Developing Learning Media

Creativity Aspect
Originality
a. Able to create media concepts that are not commonly used.
b. Show a design that is different from existing examples.
c. Not only copying but adapting ideas with new innovations
Flexibility
a. Can change media design according to learning needs or context.
b. Using various forms of media (digital, interactive, concrete, etc.) creatively.
Fluency
a. Actively provide additional ideas during discussions or the design process.
b. Fluently develop media content and displays according to learning objectives.
c. Media helps students understand the material more easily.
d. Media content is in accordance with learning competencies and indicators.
e. Media can be used practically in real contexts in the classroom.

3. Result and Discussion

During the research process, the researcher observed the subjects' soft skills of creativity, especially in how students conveyed ideas, explained the steps of media construction, and built effective interactions during the explanation. The results of the

observations show that creative abilities play a role in supporting accuracy, clarity, and understanding in the development of constructed learning media. The *Rogaplay* learning media (playing porogapit) is as shown in Figure 1 below.

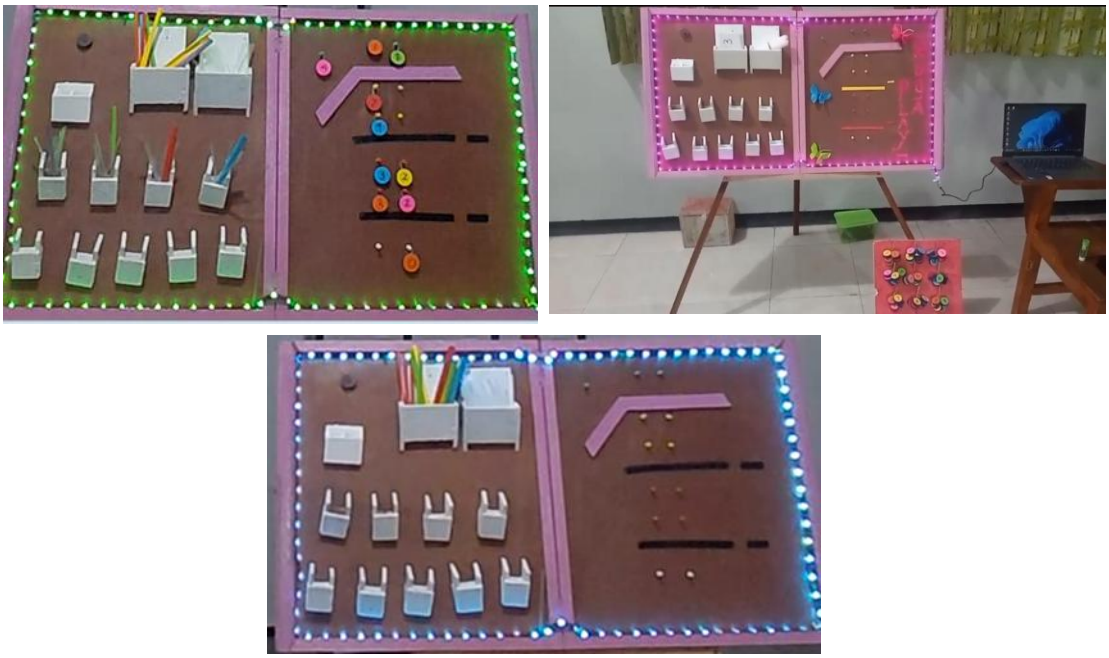

Figure 1. *Rogaplay* Learning Media

The Rogaplay learning media displayed demonstrates students' creativity, especially in designing visual displays, compiling *Rogaplay* concepts and adapting them to learning materials to make them easier. In developing the *Rogaplay* mathematics learning media, a group of three students participated. The project was titled "Developing the *Rogaplay* Mathematics Learning Media (Playing Porogapit)," as shown in Figure 2.

Figure 2. Student Presentation on *Rogaplay* Media (Playing Porogapit)

Figure 2 reflects student creativity through students' ability to communicate ideas, explain learning media concepts and package game-based learning ideas in an innovative and easy-to-understand manner. The following are the results of research on student creativity in developing learning media. The following are the results of the description of student creativity through aspects of originality, flexibility and fluency in the *Rogaplay* learning media.

Table 2. Description of Student Creativity

Creativity Aspect	Description of Findings
Originality	
Able to create media concepts that are not commonly used.	In the *Rogaplay* learning media, the development of learning media that leads to visual aspects. *Rogaplay* on the porogapit material is in the form of a game board that guides the steps of division in stages. *Rogaplay* facilitates the process of working on porogapit in an organized manner, so that 6th grade elementary school students can see each step of division in an interesting way. In addition, using materials from objects in the surrounding environment, such as boards, bottle caps, straws, magnets and LED lights so that it is more interesting and easier to form porogapit patterns, with the use of colorful LED lights that are used to indicate correct or incorrect answers.
Showing a different design from existing examples.	*Rogaplay* learning media displays a different design from existing media. Students developed a new version that is more interesting, relevant, and contextual to suit students' needs. Students in implementing *Rogaplay* use colorful visual designs, a gradual process so that students can follow the process of working on porogapit without difficulty. The use of *Rogaplay* is supported by varied questions, when working on questions in *Rogaplay,* the student's answer is correct, the LED light will turn green. Using bottle caps and straws that not only contain numbers but are equipped with magnetic boxes that make it easier for students to understand the porogapit flow on *Rogaplay* media.
Not only copying but adapting ideas with new innovations.	*Rogaplay* adapted the porogapit material from a 6th-grade elementary school textbook and then added step-by-step solutions using Rogaplay learning media. *Rogaplay* became an interactive medium by incorporating recycled materials found in the school environment.
Flexibility	
Can change media design according to learning needs or context.	The *Rogaplay* learning media used can adapt to classroom conditions, student abilities, learning time, and learning objectives. *Rogaplay* can present division problems at various levels (small numbers, large numbers, numbers with remainders, or without remainders), so users can adjust the learning process to suit their students' abilities.

	Rogaplay can display step-by-step solution steps according to learning needs. Teachers can replace example problems with contexts relevant to students. *Rogaplay* is adapted to contextual learning, including division of objects and games.
Using various forms of media (digital, interactive, concrete, etc.) creatively.	*Rogaplay* learning media comes in a concrete form, using numbers attached to used bottle caps, straws and boards that help provide concrete visuals on the porogapit material.
Fluency	
Actively provide additional ideas during discussions or design processes.	In developing *Rogaplay* media, additional ideas were instrumental in formulating a media format that met students' needs. Students actively participated in group collaborations, often contributing new ideas to refine the media design.
Fluently develop media content and display according to learning objectives.	Students demonstrated fluency in developing and compiling *Rogaplay* using porogapit material in a coherent, clear, and engaging manner. The resulting *Rogaplay* had a consistent presentation flow, the visuals supported student understanding, and the steps for using *Rogaplay* were easy for students to follow. Students were able to organize media content with a logical and engaging flow, aligned with core competencies and expected learning outcomes.
Media helps students understand the material more easily.	The *Rogaplay* learning media created serves as a tangible tool for explaining abstract concepts, making it easier for students to understand the material. Clear presentations, precise illustrations, and simple explanations enable students to follow the process of dividing porogapit more quickly. The smoothness of *Rogaplay's* creation is reflected in the ease of access and understanding for students.
Media content is in accordance with learning competencies and indicators.	Students are able to ensure that each media component supports the achievement of learning objectives and does not deviate from the core material. Fluency in designing is evident in the students' ability to adapt the media to problems in grade 6. Such as performing integer arithmetic operations including division, the goal of developing *Rogaplay* according to student abilities so that students can more easily understand the porogapit material using *Rogaplay* media.

Media can be used practically in real contexts in the classroom.	The media was designed with ease of use in mind for teachers and students, both in face-to-face and online learning. The success of developing *Rogaplay* learning media for sixth-grade elementary school students' porogapit material is characterized by the ability to generate ideas, compile, and use questions in *Rogaplay* easily and effectively. The developed media not only clarifies the concept of tiered division for students but is also relevant to the school environment and easy to use in everyday learning.

Next, the researcher conducted interviews with the subjects to support and validate the findings obtained through observation. The researcher then conducted structured interviews with the research subjects. The interviews were conducted to obtain a more in-depth explanation of the soft skills of creativity in constructing the *Rogaplay* learning media and the forms of application of the soft skills of creativity demonstrated during the activity. Thus, the observation data can be strengthened through more comprehensive verbal information. The following are the results of interviews regarding students' soft skills of creativity in constructing mathematics learning media.

Table 3. Results of Interviews with Research Subjects

Indicator	Question	Answer
Originality 1. Able to create media concepts that are not yet commonly used. 2. Present designs that differ from existing examples. 3. Not only imitate but adapt ideas with new innovations.	How did you develop the concept of *Rogaplay* media based on the porogapit game so that it has an element of novelty?	I modified the traditional game of porogapit into a more structured learning tool. While porogapit is typically used solely for play, I adapted it into an educational game with challenge cards, knowledge points, and relevant learning situations. This creates a unique concept that's not yet commonly used in learning activities.
Flexibility 1. Can change media design according to learning needs or context. 2. Using various forms of media (digital, interactive, concrete, etc.) creatively.	What makes the porogapit media design that you created different compared to other games or educational media?	I created a design using recycled bottle caps, straws, and wooden boards, along with themed LED lights, for example, based on the subject matter. Each card has a different symbol, category color, and instructions to make it more engaging. I also combined traditional and modern elements, creating a unique look that doesn't

Fluency 1. Actively provides additional ideas during discussions or the design process. 2. Actively provides additional ideas during discussions or the design process. 3. Fluently develops media content and presentation according to learning objectives. 4. Media helps students understand the material more easily. 5. Media content aligns with learning competencies and indicators. 6. Media can be used practically in real-world classroom contexts.	Can you modify this *Rogaplay* media according to learning needs?	strictly follow existing examples. Of course. The game rules, number of cards, and difficulty level can be adjusted to suit the student's level and the subject matter. For example, for lower grades, I create simpler instructions, while for higher grades, I add challenges that require analysis. So, this tool is very flexible.
	Do you actively contribute additional ideas during the media design process?	Yes, I often introduce new ideas, such as adding question categories, group division formats, and layered challenge variations. These ideas help enrich the game's structure, making it more engaging and easier to use in the classroom.
	Is the media content in accordance with learning competencies and indicators?	Yes. I designed the *rogaplay* media, challenges, and gameplay based on core competencies and established indicators. Every activity in the game leads to a learning outcome, so this media truly supports the learning process.

Based on the explanation above, the *Rogaplay* learning media developed by students can increase student engagement and enthusiasm in answering math problems, helping students understand abstract mathematical concepts more easily. The use of *Rogaplay* learning media can support student learning activities, thus improving student learning outcomes.

Based on research conducted on mathematics education students at PGRI Jombang University on October 14, 2025. Learning mathematics, previously considered challenging for some students, has become more enjoyable and engaging through the use of innovative and interactive learning media. Learning outcomes indicate that the use of innovative and interactive learning media can increase student interest in learning mathematics.

In elementary school, learning media are concrete and contextual objects that help students understand abstract mathematical concepts and make them easier to grasp. Mathematics learning media are tools or methods used to support a more effective and engaging teaching and learning process [17]. In line with research [18], the benefits of learning media can increase student activity in learning. From the learning media aspect, *Rogaplay* (playing porogapit) received a very good qualification. In this aspect, *Rogaplay* (playing porogapit) was implemented very well in classroom learning, because *Rogaplay* (playing porogapit) helped students to more easily understand the concept of porogapit. The presentation of the material, material selection, layout, and color composition received a very good qualification. This is in line with previous research, which stated that a media that

is suitable for use in learning should follow a layout and color composition that is attractive to students [19].

In terms of student creativity, the *Rogaplay* (playing porogapit) learning media development achieved a good qualification. Students demonstrated creativity through originality, flexibility, and fluency in creating a learning media concept that is not yet commonly used. *Rogaplay* was developed through visual media in the form of a game board that utilizes materials found in the surrounding environment, such as used bottle caps, straws, magnets, small boxes made of board, LED lights, and boards for attaching the materials. Students were able to display new approaches and designs from previous media examples, by presenting *Rogaplay* (playing porogapit) making it easier for students to understand the concept of porogapit material in grade 6. Through the fluency of the *Rogaplay* (playing porogapit) media, it helps students' understanding, as a concrete tool that explains the concept of porogapit. In line with research conducted [20] that the resulting media is more helpful, channeling creativity in producing works. The integration of students' creative soft skills in developing mathematics learning media is also in line with research conducted by [21] that teaching aids or learning media can construct the ideas/concepts that students need.

4. Conclusion

Based on the results of research and discussion regarding the development of *Rogaplay* learning media conducted by mathematics education students, it can be concluded that students in developing *Rogaplay* have fulfilled all indicators of creativity in developing *Rogaplay*. Students constructing *Rogaplay* learning media demonstrate creative skills in formulating ideas, adapting media to students' needs and characteristics, as well as student creativity in designing innovative learning media according to students' needs. Thus, the use of Rogaplay as a mathematics learning medium for elementary school students shows potential in supporting student learning activity.

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