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Teacher Creativity Enhances Children's Cognitive Development through Traditional Games in Muslim Educational Institutions

Mona Yulia Zulfa[1], Elia[1], Nurasiah Ahmad[1], Hilma Nafsiyati[1], Syahminal[1], Afdhalul Husni[2], Uldiman[3]
[1]STIT Syekh Burhanuddin Pariaman, Indonesia
[2]Universitas Muhammadiyah Sumatera Barat, Indonesia
[3]Universitas Islam Negeri Imam Bonjol Padang, Indonesia
monayuliazulfa@stit-syekhburhanuddin.ac.id *

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Abstract

Early childhood cognitive development is a critical phase that requires appropriate stimulation to support logical thinking abilities and the use of basic concepts. Traditional games such as *congklak* have the potential to be an effective learning medium. This research aims to evaluate the influence of the conventional media game *Congklak* Geometric in improving the cognitive development of early childhood. This research uses the Research and Development method with the Analysis, Design, Development or Production, Implementation or Delivery, and Evaluation (ADDIE) model, which is then tested in a learning process involving fifteen students as research subjects. All data was analysed using correlation analysis techniques with IBM SPSS 25 Software. The results of the analysis regarding the use of geometrically shaped *congklak* media products show the criteria i) material aspect, 87.50%, ii) cognitive aspect, 82.50%, iii) media aspect, 82.16% with a total average of 84.16%. Furthermore, the results of statistical analysis show that *congklak* media is proven to be able to stimulate the cognitive development of young children with a focus on geometric shapes in the learning process with a total average of 84.16%. The findings of this research indicate that the geometric *congklak* game can be integrated into the early childhood education curriculum as an effective strategy to support cognitive development.

INTRODUCTION

Early childhood is a very important phase for the development of later life because this period is known as the sensitive period or golden age (Hidayati, 2020; Nugraha, 2020; Wiguna, 2021). In line with Hurlock's opinion in Fauziddin & Mufarizuddin, (2018); Purnama et al., (2020), early childhood or childhood is a period that demands extra attention because development during this period occurs quickly and is easy to see and measure. According to La Rue, (2010), stimulating cognitive development in children can start with the introduction of geometric shapes, especially for preschool children. Gardner also states that developing children's cognitive abilities through the introduction of geometric shapes can help children understand their environment better. Children can think mathematically and logically and can

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understand simple concepts in everyday life. Learning media is an important tool in conveying lesson material in class. This media can help teachers overcome difficulties, in conveying material to students, especially if the learning media used is inappropriate, there are differences in student characteristics and low learning motivation. In the book "Introduction to Communication Science", several concepts or definitions of educational media or learning media are explained (Akmalia et al., 2021).

Traditional games are games that have existed since ancient times and have been passed down from generation to generation. Aids in traditional games are usually made from wood, bamboo, shells, and other natural objects, so they do not require large costs. However, in Indonesian society today, the existence of traditional games is starting to be replaced by games and other modern toys, along with the rapid growth in gadget use in Indonesia (Lamb et al., 2018; Zulkhi & Jannah, 2022).

Based on data from Scopus, previous research from 2019 to 2023 utilized several keywords related to creativity, teaching, students, engineering education, and problem-solving. This is illustrated in Figure 1 below:

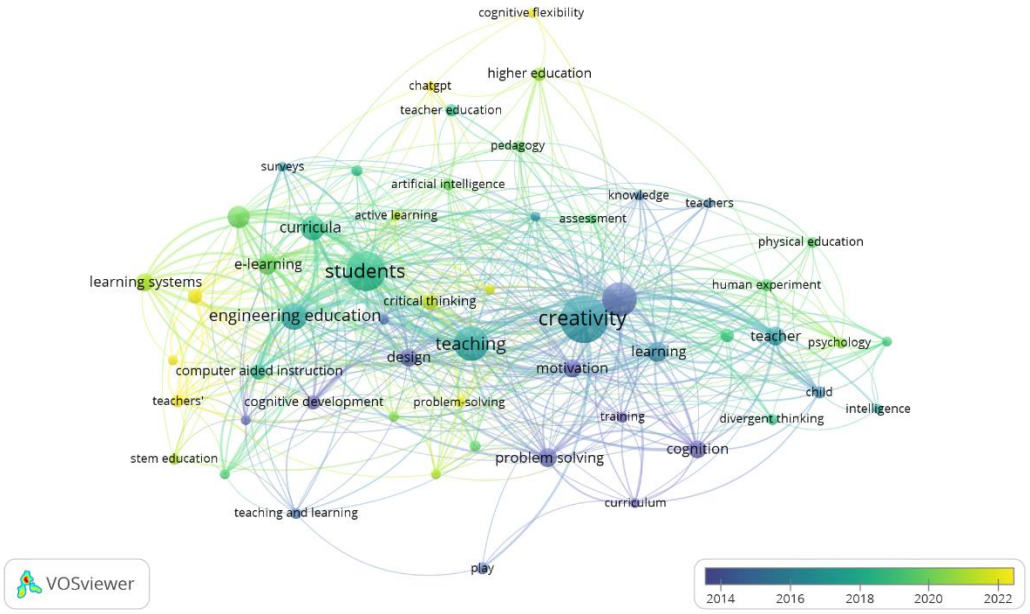

Fig 1. Results of Vosviewer Analysis Based on the Keyword Creativity, Teaching, Students, Engineering Education, and Problem Solving

Based on data from Scopus, prior research from 2014 to 2022, using keywords such as creativity, teaching, students, engineering education, and problem solving, indicates that educational research has predominantly focused on various aspects of teaching, learning, and creativity. This analysis, conducted on September 4th, 2024, at 20:58 using the VOSviewer software, aimed to identify the novelty of ongoing research. The results reveal a concentration of studies on the development of creativity through teaching and learning across various disciplines, particularly within the context of engineering education and problem-solving. However, there is still a significant gap in research specifically exploring how teacher creativity can be leveraged to enhance children's cognitive development through traditional games, particularly within Muslim educational institutions. Thus, this study is crucial for contributing new insights into the role of traditional games as a means to foster cognitive development in children within Muslim educational settings, as well as offering creative alternatives for teachers to support more effective and contextually relevant teaching and learning processes.

METHODS

This research uses the method of Research and Development (R&D) with the ADDIE model as a research approach. According to Ranuharja et al., (2021); Toni &

Sudin, (2024), this approach can be used by researchers who aim to produce a product or prototype as a research output. The R&D method is a series of processes used to develop or perfect a product so that it can be scientifically justified Arora et al., (2018); Lizarralde et al., (2020). In this research, researchers used the ADDIE model which consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was chosen because it has a systematic development structure and can be applied easily to produce products that are useful for users. To make it clearer, it can be seen in Figure 2 below:

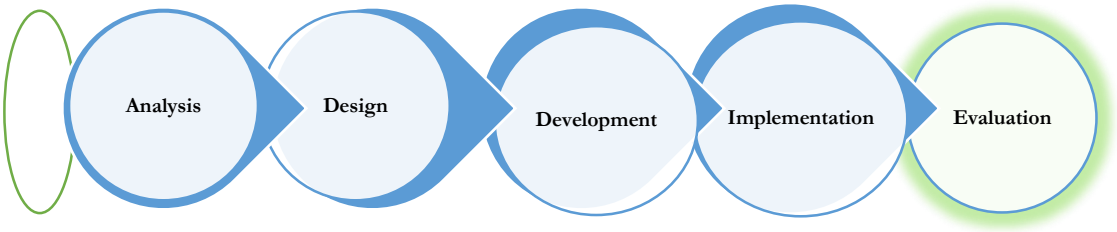

Fig 2. Research Steps

The first stage, Analysis, is used to identify the need for fun and effective learning media to stimulate the cognitive development of early childhood. At this stage, researchers found that traditional game-based learning media, such as *congklak*, are still underutilized in early childhood education. Design is the second stage, where researchers design learning media by modifying *congklak* so that it has elements of attractive geometric shapes. Emphasis is placed on the use of colour and geometric shapes that can stimulate children's mathematical logic. After the media design is complete, stage Development is carried out to develop better products. *Congklak*, which was initially only used as an everyday game, was developed into a learning medium that can stimulate early childhood cognitive development in mathematical logic.

The fourth stage, Implementation, involves testing geometric *congklak* products as a learning medium in the learning process of early childhood. This product was tested involving thirty students. Pamela Minet defines intellectual development as mental development, and in this context, *congklak* media aims to stimulate children's cognitive development, especially in terms of introducing basic geometric and logical concepts. Cognitive abilities in early childhood are very important as the basis for their future intellectual development (Carson et al., 2016).

The geometric *congklak* media product produced in this research has been validated by three experts in the fields of educational technology, cognitive development psychology, and arts and culture. Validation is carried out repeatedly until the product is declared quality. Validation results from experts show that this media is very valid, with an average rating of 84.16%. Table 1 below shows the results of this assessment:

Tabel 1. The Results of Expert Assessments of the Products Made

No	Assessment criteria	Validity (%)	Category
1	Material Aspects	87,50 %	Very Valid
2	Cognitive aspect	82,50 %	Valid
3	Media Aspect	82,50 %	Valid
Total Average		84,16 %	Very Valid

After validation, this *congklak* media product was tested in a lesson involving thirty students. The data obtained was then analysed using IBM SPSS 25 software with correlation analysis techniques.

RESULT AND DISCUSSION

The results of this research show a significant increase in the cognitive abilities of young children after implementing learning media based on the traditional geometric game *congklak*. This increase is reflected in the comparison of the pre-test and post-test scores obtained by the students, as shown in the following graph. Further analysis will discuss the differences between pretest and posttest results and their implications for the effectiveness of the learning media being developed. For enhanced clarity, please refer to figure 3 below:

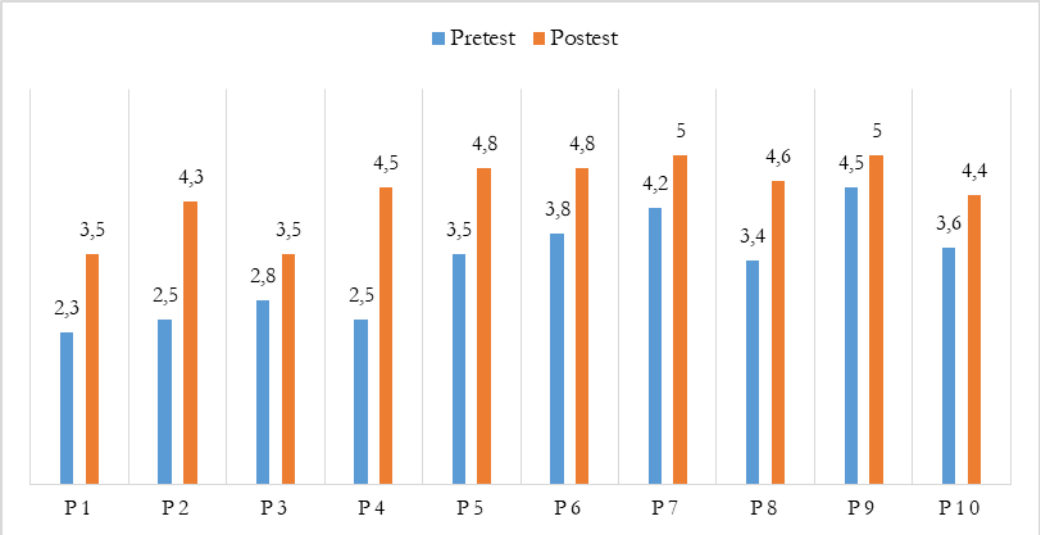

Fig 3. Comparison of Pre-test and Post-test Scores on Ten Research Subjects (P1-P10)

Based on the graph, probability numbers are obtained from *Asymp. Sig. (2-tailed)* children's activity during the learning process is 0.875 or probability below alpha (0.875<0.05). Based on these results, H_0 was rejected and H_I was accepted. Thus, it can be interpreted that there are differences in pre-test scores and post-test scores for the traditional *congklak* game media on the cognitive development of early childhood.

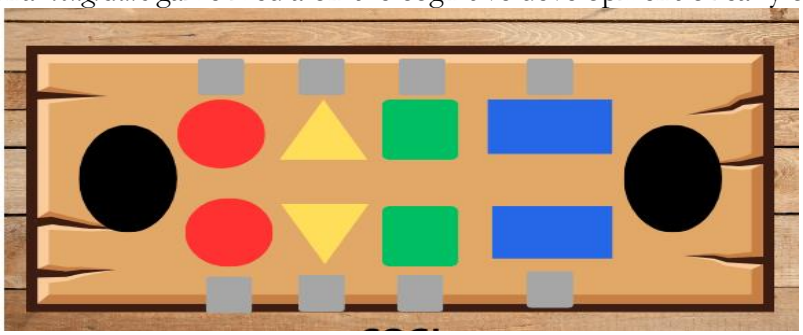

Fig 4. Media of Geometric Arrogance

Table 2. Results of Observations of Aspects of Children's Cognitive Development by Teachers

No	Assessment Aspects	Presentation	Category
1	Child's expression	83,12 %	Valid
2	Children's ability to understand geometric shapes	86,25 %	Very Valid
Average Percentage		84,68 %	Very valid

Based on the table above, it can be seen that the 2 indicators are expected. The effectiveness assessed by the teacher shows that the overall average result of the

assessment of children's effectiveness as assessed by the teacher after carrying out *congklak* media activities is 84.68% in the very practical category. This means geometric *congklak* media that has been developed has been effective both in terms of presentation and use. Thus, it can be concluded that the effectiveness of geometric *congklak* media in early childhood based on the results of the child observation sheet filled out by the teacher is categorized as very effective.

Table 3. Results of Observations of Aspects of the Cognitive Logical Development of Children's Geometric Shapes by Parents

No	Assessment Aspects	Presentation	Category
1	Child's expression	74,37 %	Valid
2	Children's cognitive development	83,12 %	Valid
Average Percentage		78,74 %	Valid

Based on the table above, it can be seen that the 2 indicators of effectiveness assessed by parents show that the overall average result of assessing children's effectiveness as assessed by teachers after observing them presenting games in the traditional *congklak* game is 78.74% in the practical category. This means geometric *congklak* media which was developed and designed by the author has been effective in both presentation and use. Thus it can be concluded that the effectiveness of geometric *congklak* media Based on the results of the observation sheet on aspects of children's cognitive development filled in by parents, it is categorized as effective.

Based on the results of the validation carried out by three expert validators (lecturers) it was stated that the geometric *congklak* media is very valid with an average validity value of 84.16%. Thus it can be concluded that the geometric *congklak* media has been very effective. This is also in line with the findings of experts according to Bastian 2016, Effectiveness can be interpreted as success in that it means that if teachers teach using innovative media, children's creativity will increase (Mutaqin et al., 2023; Raihany et al., 2022; Sitanggang & Munthe, 2023).

Furthermore, one important aspect of early childhood growth and development is cognitive development. Building geometric concepts in children begins with identifying various shapes and investigating their structure, as well as distinguishing simple images such as rectangles, circles, and triangles. Learning geometry that is carried out regularly will help children understand these geometric shapes. Simple geometric shapes, such as triangles, circles, squares, and rectangles, are often encountered by children in everyday life. For example, a triangle resembles a birthday hat, a circle resembles a ball, a square resembles a box, and a rectangle resembles a chalkboard. Playing and musical activities can also help children develop their physical abilities. Coordination abilities can be developed through games that aim to develop their muscles (Carson et al., 2016; Hsiao & Chen, 2016).

Based on the theoretical explanation above, it can be concluded that music has a significant influence on the intelligence of young children, especially in the development of the learning process and optimal absorption of information (Brown et al., 2023; Febriani et al., 2022; Haerudin & Noor, 2022). Therefore, it is important to stimulate the development of children's emotional intelligence through music with simplified lyrics by the criteria for good music for early childhood. The game of *congklak*, which is a traditional game that has existed for a long time in the archipelago and was very well known by the people of its time, is now starting to be forgotten.

The *congklak* game is a traditional game that has long been popular with children. This game is played in a fun atmosphere, where children can sit relaxed without pressure while chatting with friends (Agusti et al., 2018). Even though it looks simple and is starting to be abandoned, the *congklak* game turns out to have many benefits for children's development (Hidayati, 2020). Based on test results on *congklak* media that have been designed and used through pre-test and post-test, learning innovations like

this have proven to be effective in creating a learning atmosphere that is interesting and easy for children to understand.

Furthermore, the validation results show that the cognitive aspect obtains a value that is included in the very valid category. This means that the material has been prepared well, and the design is adapted to simple procedures, colours, and geometric shapes, easy for children to understand. The information presented is clear and easy to understand, these results were obtained after carrying out several necessary revisions.

From the media aspect, validation also shows that the media presentation of geometric *congklak* is included in the very valid category. This shows that the presentation of the media, both in terms of colour, geometric shapes, and indicators to be achieved, is by the child's cognitive development. The presentation of clear and attractive images, as well as the right colour balance in *congklak*, the use of images in learning media can attract attention and make understanding easier (Efendi et al., 2019; Munawaroh et al., 2022). The use of media in Kindergarten is very important in helping the development and growth of early childhood, especially in the cognitive aspect, with interesting types of media.

The practicality of geometric *congklak* media aims to see to what extent teachers can understand and use geometric *congklak* media which attracts the attention of young children. This media must not only meet validity criteria but must also be practical, meaning that it can be used by parents and teachers easily (Khilmiyah & Wiyono, 2021; Nasril et al., 2023). This is in line with the opinion of (Muslan et al., (2023) that media is said to be practical if it can be understood and is easy to use. To find out whether the geometric *congklak* media is practical or not, this can be seen from the validation of the parent and teacher response questionnaire.

CONCLUSION

This research has succeeded in revealing. Based on data analysis and discussion of the research data that has been carried out, it can be concluded that the results of the validity test of geometric *congklak* media by media expert lecturers, material experts, and language experts are rated in the very good category and the geometric *congklak* media developed is valid. The results of the practicality test of geometric *congklak* media by five Kindergarten teachers were rated in the very good and very practical categories. Test the effectiveness of geometric *congklak* shows that the media designed is quite effective for children's cognitive development.

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