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Canva-Assisted picture storybook with a scientific approach to improve early childhood visual-spatial intelligence

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Abstract

This research aims to develop a Canva-assisted picture storybook with a scientific approach to improve the visual-spatial intelligence of early childhood. The problem found was the difficulty of children recognizing colors, shapes, patterns, and maps. The subjects consisted of 5 children in a limited test and 15 children in a broad test at a kindergarten in West Bandung Regency. The R&D method with the ADDIE model was used, data was collected through interviews, observations, and questionnaires, and then analyzed descriptively and nonparametrically. Product validation showed that the media and practitioners rated it very feasible, and the material expert assessed it as feasible. The Wilcoxon test showed a significant value of 0.001, indicating that the book is effective in developing children's visual-spatial intelligence. The indicators of color, pattern, shape, and maze reached the category of Very Well Developed.

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Tunas Siliwangi
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STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
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INTRODUCTION

The The need for visual-spatial improvement for early childhood has increased in line with the learning needs of the 21st century which prioritizes creative, critical thinking and problem-solving (Tania Sari et al., 2026). Early childhood education is a crucial foundation to help increase children's growth and development. At this stage, children experience an increase in a number of aspects in the form of social-emotional, fine and gross motor, cognitive, language, and art if the stimulation provided is appropriate according to the child's age stage (Astuti & Triani, 2024). Although educators provide the same stimulation to every aspect of development, the achievement of children's abilities differs, including in visual-spatial intelligence.

Based on Multiple Intelligences theory by Howard Gardner (2011) through his book "Frames of Mind: The Theory of Multiple Intelligences" it is stated that there are 9 intelligences in individuals, one of which is visual-spatial intelligence. This intelligence is seen from the indicators that children can recognize colors, be able to understand maps or directions, recognize the position of objects, recognize images, diagrams, recognize patterns, shapes and others. This is also cited in the research (Fauziah Nasution et al., 2025). Stimulation to develop visual-spatial intelligence in early childhood needs to be done because it is part of the cognitive aspect. This is in line with the study Fathonah et al. (2020). According to the theory of cognitive development by Jean Piaget (1969), visual-spatial competence in early childhood develops with an active, concrete, and harmonious learning experience that is in harmony with the child's developmental stage.

At one of the kindergarten institutions in West Bandung Regency , 15 students were sampled to see the child's visual-spatial intelligence. The results in the field stated that the indicator of recognizing colors occupies the category of Starting to Develop, patterns and shapes occupy the category of Not Developing, and recognizing maps occupies the category of Starting to Develop. Based on the results of the study, it can be seen that there is no maximum development, most of them have difficulty in mentioning colors (often confused in mentioning color names), do not recognize the names of shapes, cannot identify patterns correctly, and confusion in determining the direction of the road to the destination such as on a map or maze. This is estimated from various factors, such as monotonous learning media, namely filling out children's worksheets (LKA) and playing blocks, so that children experience boredom. The influencing factors are the lack of variety of learning media provided by teachers and the lack of parental monitoring to stimulate children's learning activities. With this problem, teachers play an important role in finding solutions through learning media that will be delivered to encourage the continuous growth of visual-spatial intelligence for early childhood to be able to develop more optimally.

Picture storybooks, according to Ngura et al. (2020), is the result of writing that is presented with a short story, but it is interesting for children to see because there are pictures, making it easier for children to develop their imagination to be able to dive or imagine the story. Visual-spatial stimulation in picture storybooks occurs when children process two-dimensional illustrations. Color recognition can help children distinguish elements of objects, while patterns and shapes can train the ability to recognize geometric structures. Meanwhile, according to Michell (Halim & Munthe, 2019), a picture storybook is a story with a relationship between images and text.

Canva is an online graphic design that allows users to use directly with Template existing or re-edited that can be adjusted to the content needed. Meanwhile, according to Rohmiasih et al. (2023), Canva can be used to create learning media. Continued by opinion (Muliatik et al., 2025), Canva can create story media by combining text, audio, and images. While early childhood is rarely fluent in reading, but with storybooks, children can see information through pictures. Children are very happy to be read storybooks. Therefore, teachers can help tell stories. By storytelling, children can find out the storyline in the book.

The scientific approach is defined as an approach to form a child's mindset and reasoning power which consists of 5 stages, namely: observing, questioning, gathering information, reasoning, and communicating as attached to the 2013 Curriculum. The scientific approach is not interpreted as science learning, but the application of scientific processes to learning activities. Meanwhile, what was stated by Duckworth (Yunita et al., 2019) That the importance of introducing the scientific process is carried out with the direct involvement of children in an activity, namely seeking information until they understand the world accompanied by amazing thinking.

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Based on previous research submitted by several researchers, among others, it was stated that activities can improve spatial visual intelligence through beam centers (Pa'indu et al., 2021) and media puzzle cross road map (Muttaqien & Nurul Apriani Sa'adah, 2023).

Based on the results of previous research studies, most of the development of picture storybooks in children's education still focuses on a number of improvements, including: digital literacy skills (Rizkiyah, 2022), improved reading (Nikmah & Darwati, 2021), stimulation of empathy skills (Sumiati & Tirtayani, 2021), and cognitive abilities (Abdul Salam et al., 2023). Meanwhile, research that focuses on indicators of recognizing colors, shapes and patterns, as well as maps or mazes, is still very limited. The improvement of picture storybooks intended for children aged 5-6 years has not been done much. In addition, the use of the Canva application to create picture storybooks combined with scientific approaches has not been widely researched. Thus, researchers created picture storybooks with the help of the Canva application combined with scientific approaches as learning media to foster the visual-spatial intelligence of children aged 5-6 years, especially indicators of recognizing colors, recognizing patterns and shapes, and recognizing maps or mazes. The picture storybooks created in this study are aligned with the situation in the field, namely with the theme of Pramuka Prasiaga adventure. This research aims to develop visual-spatial intelligence with Canva-assisted picture storybooks with a scientific approach. Meanwhile, this research also has the purpose of improving, assessing the feasibility of the product and testing the effectiveness of the product.

METHOD

This research applies the Research and Development (RnD) approach. Based on Sugiyono's research (Gustina & Husnayayin, 2024), R&D research methods are applied to obtain certain products and test the effectiveness of a product. Research methods are used to create optimal, practical, and attractive products. This research applies a model approach *Analysis, Design, Development, Implementation, and Evaluation* (ADDIE). The ADDIE model is a structured approach that is designed to obtain optimal instructional products (Scott, 2025). This development was chosen because it can develop picture storybook media to see the feasibility of learning media, teachers' responses to the media formed, and the development of visual-spatial intelligence for children. If outlined with a picture of the development of the stages of the ADDIE model are as follows:

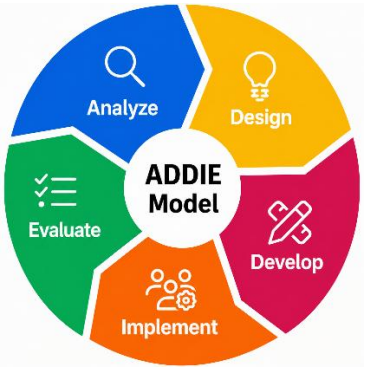


Figure 1. Stages of Product Development with ADDIE Model Approach

Sources: (Adilla, 2025)

Figure 1 shows the 5 primary stages that include analysis, planning, development, implementation, and evaluation. This image is used as a research guide in growing learning media products, namely Canva-assisted picture storybooks combined with a scientific approach.

The data collection technique in this study was carried out by observation, interviews and questionnaires. The first technique is observation which is carried out to obtain learning in the field as a basis for researchers in determining the needs for the development of learning media. Observation is focused on the characteristics of students and the learning process, especially the need for learning media that is more interesting than paper picture storybooks. The research subjects consist of children aged 5-6 years in kindergarten in West Bandung

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Regency. Sample selection using the purposive sampling technique, which is the determination of samples based on references and characteristics that have been determined by the researcher in line with the research objectives. The limited trial included 5 children in group B2, while the extensive trial included 15 children in group B1 5-6 years old who were in the same school. The research was carried out for 8 meetings, with teachers acting as the implementers of the activity and teachers and researchers as assessors. Learning implementation is given for 30 minutes at each meeting.

The next collection technique is an interview. The interview is carried out through direct question and answer with four teachers as resource persons. The purpose of the interview is to obtain further information while strengthening and confirming the data obtained through observation, especially related to learning conditions, student needs, and the use of learning media that is appropriate for the needs of early childhood. Then, the next collection technique is a questionnaire. The questionnaire is applied to obtain data related to learning media products. The questionnaire is submitted to media experts, material experts, and practitioners to obtain suggestions on improving the media before being used in the trial stage. Then the findings are analyzed with descriptive statistics and nonparametric tests.

The data collection instruments applied include observation sheets, interview references, and assessment questionnaires. The instruments are compiled based on aspects and indicators relevant to the research objectives. The assessment sheet contains assessment items used to measure the feasibility of picture storybook learning media products, while observation sheets are used to obtain data on the development of children's visual-spatial intelligence.

Table1. Interview of Children's Learning Media Needs

No	Question	Conclusion of Response
1	What kind of media is most needed to improve visual-spatial intelligence?	
2	What are the obstacles that often occur when delivering material to children?	
3	Have you ever heard of the scientific approach?	
4	How important is doing activities to improve early childhood visual-spatial intelligence?	
5	What kind of activities can improve visual-spatial intelligence with a sanitizing approach in early childhood?	

The interviews conducted by the researcher are semi-structured, where the researcher prepares written interview guidelines as the main guide. However, it provides a new question space according to the answers submitted by the teacher to dig deeper information when in the field. The interview procedure is recorded with a mobile phone audio recorder accompanied by the permission of the interviewer. Then the recording results are changed into written form. The answer analysis technique uses a qualitative method with conclusion drawn. As for ensuring the credibility of the data by triangulating sources and member checks, the data concluded by the researcher is re-checked by the four sources.

Table 2. Children's Adaptability to Digital Products

aspects	Indicator	Number of children (N=15)	Percentage
Children's interest in learning using digital media	Focused, enthusiastic child	12	80%
Children's response to technology	Happy and active child	14	93%

Based on Table 2, the research conducted on March 31, 2026 on children's adaptability to digital stated that as many as 12 out of 15 children (80%) showed interest in learning using digital media by showing focus

TUNAS SILIWANGI
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Volume. 12, Number. 2, October 2026

and enthusiasm during the activity. In addition, 141 children (93%) gave a positive response in the form of a sense of pleasure and activeness in participating in learning. The results of this initial observation show that the majority of children are able to adapt to the use of digital media, although there are still a number of children who need assistance in participating in learning activities.

Table 3. Visual-Spatial Intelligence Observation Grid

Indicator	Observation item	Descripsion			
		BB	MB	BSH	BSB
Children are able to recognize patterns nd shapes	Mention triangular, square geometric shapes and be able to continue the AB-AB pattern				
Children are able to recognize maps/mazes/mazes (following the path)	Determining the correct direction of the road according to the map showing the road				

Description :

BB : Children have not been able to carry out activities even though they have been given examples and help from teachers

MB : Children are starting to be able to carry out activities but still need a lot of help or direction from teachers

BSH : Children are able to do activities correctly, but still need a little help or reinforcement from the teacher

BSB : Children can carry out activities independently

Table 3 is designed as a child assessment instrument to measure visual-spatial intelligence through the use of digital picture storybook media. The assessment of this instrument is based on four levels of developmental achievement, namely BB score 1, MB score 2, BSH score 3, and BSB score 4. The visual-spatial intelligence parameters observed are recognizing colors, patterns and shapes, as well as maps or mazes.

Table 4. Assessment Rubric

Score	Range	Remarks
4	3,26 - 4,00	Very well developed
3	2, 51 – 2,50	Growing up with expectations
2	1, 76 – 2,50	Start growing
1	1 – 1, 75	Not yet developed

Based on the assessment rubric table, score 4 (3.26-4.00) is categorized as BSB (Developing Properly). This range shows that the achievement of the target of child ability development has been very good in understanding based on the child's age. Score 3 (2.51-3.25) is categorized as BSH (Developing as Expected). Then, for score 2 range (1.76-2.50), it is categorized as MB (Starting to Develop), characterized by the child's ongoing competence . Meanwhile, score 1 (1.00-1.75) is categorized as BB (Not Developing) development, indicating that it has not reached the minimum indicator in the aspect assessed.

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Table 5. Scientific Approach Grid

Dimension	Indicator	Behavior description
Observing	Observe the pictures in the story on each slide	Children pay attention to the pictures, colors, shapes, found in the storybook
	Listen to audios stories	Children pay attention to audio narration
Ask	Responding to inquiries	Children respond to questions in the story presented by the teacher
Gathering information	Identify information from images, text and audio	Children find information from stories based on illustrations, narratives and text
Reasoning	Conntecting the information obtained	Children can connect the content of images, audio, text to understand the content of the story
communicating	Retelling the content of the story	Children retell the content of the story simply

The table above is a grid of scientific approaches that explain the guidelines for the stages of thinking adapted for children with observing, questioning, gathering information, reasoning and communicating. This is done so that educators can record children's development in a structured and objective manner according to the results in the field. The scenario is integrated into the core activity (30 minutes) before taking a break in the classroom in the carpet or chair area. The teacher plays a picture storybook video displayed using *an Interactive Flat Panel*

Table 6. Media and Material Expert Validation Instruments

	Descriptive Statistics				
	N	Minimum	Maximum	Red	Std. Deviation
Getting to know colors	15	3	4	3.67	488
Getting to know shapes and patterns	15	2	4	3.27	799
Get to know the map/ maze	15	2	4	3.27	799

Table 6 explains the validation instruments of media experts and the materials applied to measure the feasibility of picture storybooks before they are applied to students. The assessment applies a four-level Likert scale. The aspect includes 7 indicators as presented in the table.

Table 7. Practitioner Validation Instruments

No	Aspects	Assessment Indicators	1	2	3	4
A	KD Compatibility with Product Content	**1.** The content of the story corresponds to the introduction of colors, patterns, shapes, and maps.	☐	☐	☐	☐
		2. The content of stories encourages children to observe, question, try, reason and communicate.	☐	☐	☐	☐

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

No	Aspects	Assessment Indicators	1	2	3	4
		3. Language easy to understand early childhood.	☐	☐	☐	☐
B	Product Suitability for the Child's Developmental Stage	**1.** Early childhood friendly visuals and colors.	☐	☐	☐	☐
		2. The level of the story is adjusted to the child's ability, not too long.	☐	☐	☐	☐
		3. Stories that are easy for children to understand are not convoluted.	☐	☐	☐	☐
		4. The child is able to follow the instructions to scan the barcode.	☐	☐	☐	☐
C	Teacher's Assistance with Products	**1.** Help teachers explain colors, patterns and shapes and maps.	☐	☐	☐	☐
		2. Making it easier for teachers to evaluate learning.	☐	☐	☐	☐
		3. Accelerate the preparation of learning media.	☐	☐	☐	☐
D	Children's Assistance in Learning	**1.** Children are enthusiastic about seeing and listening to stories.	☐	☐	☐	☐
		2. Children are able to answer questions independently.	☐	☐	☐	☐
		3. Stories help improve visual-spatial intelligence.	☐	☐	☐	☐
		4. Children are happy because the content is made according to what the child wants.	☐	☐	☐	☐

Table 7 explains the practitioner validation instrument applied to measure the feasibility of picture storybooks before being applied to students. The aspects assessed are divided into four, namely the alignment of basic competencies with the product content, the stage of child development, the teacher's assistance with the product, and the child's involvement in learning which has several indicators in each aspect. The assessment was carried out using a four-level Likert scale. The aspect included 7 indicators.

Table 8. Validation Scoring Rules

Score	Eligibility answer
4	Excellent
3	Good
2	Pretty good
1	Not good

Table 8 explains the rules for giving validation scores as a reference for validators in assessing the feasibility of picture storybook products with measurements of 1-4 which are divided into 4 levels. Determination of scores: 1 on the feasibility side means poor, 2 (good enough), 3 (good), and 4 (very good).

Table 9. Validation Scoring Rules

Introduce yourself	Eligibility
81.00 – 100 %	Higly worth it

TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

61.00 – 80.99%	Worthy
41.00 – 69.99%	Enough
<40.00%	Not eligible

Product Eligibility Percentage: Score obtained x 100%
Maximum Score
(Source: Herawati & Wulansuci, 2023)

The table above explains that the product validity criteria are measured using a percentage scale adapted based on research (Herawati & Wulansuci, 2023). The research is divided into four main categories, namely: highly feasible (81,00-100,00%), eligible (61,00-80,99%), enough (41,00-60,99%), and ineligible (<< 40.00%).

RESULTS AND DISCUSSION

Result

A. Analysis

Table 10. Pretest Result Data

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Red**	**Std. Deviation**
Getting to know colors	15	1	4	2.47	1.303
Getting to know shapes and patterns	15	1	4	1.67	900
Get to know the map/ maze	15	1	4	2.07	1.223

Based on the table, the results of descriptive statistical analysis on the indicator recognize colors, patterns and shapes, and recognize maps are the same in 15 students. In the color recognition indicator, an average value (mean) of 2.47 was obtained with a data distribution rate of 1.302. Meanwhile, the average value for the indicator of recognizing patterns and shapes was recorded at 1.67 with a data distribution rate of 0.900, and the indicator recognizing maps as a result was 2.07 with a data distribution rate of 1.223. Therefore, it can be concluded that the indicator recognizing colors with a result of 2.47 entered in the range of 1.76-2.50 including the MB (Starting to Develop) category where the students' abilities have begun to be seen, but are not yet optimal. Meanwhile, the indicator recognizes patterns and shapes with an average of 1.67 entries in the range of 1-1.75. This occupies the BB (Not Yet Developed) category, meaning that it is still in the early stages and needs further stimulation. Then, the results of data analysis on the map recognition indicator with an average of 2.07 are in the range of 1.76-2.50 which occupies the MB (Starting to Develop) category.

Table 11. Interview Results of Children's Learning Media Needs

No	Questions	Conclusion of Response
1	What kind of media is most needed to improve visual-spatial intelligence?	Children are happy with digital media because they have images, audio, and colors that look attractive. Can be displayed using mobile phones, laptops and others.
2	What are the obstacles that often occur when delivering material to children?	Limited knowledge and encouragement to create teaching media.

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

No	Questions	Conclusion of Response
3	Have you ever heard of the scientific approach?	Ever, it is often done at outing class activities, watching videos or even just showing a picture.
4	How important is doing activities to improve early childhood visual-spatial intelligence?	It is important to do but the limited knowledge so it is often done through filling out LKA (Children's Worksheets) and playing blocks.
5	What kind of activities can improve visual-spatial intelligence with a scientific approach in early childhood?	Because of the activity that the children are enjoying, namely Prasiaga Scouts, and a storybook is needed, a picture storybook was made with the theme of Prasiaga's adventure.

Based on the results of interviews with four teachers with 5 structured and semi-structured questions, based on the table above, the steps taken by the researcher to check the accuracy of the data were to conduct interviews with 4 teachers at the Kindergarten institution in West Bandung Regency. The results stated that the stimulation of visual-spatial intelligence is often carried out through the media of LKA (Children's Worksheet) and blocks, but it has not run optimally. On the other hand, the enthusiasm of students for digital media is possible because it is more interesting than the display of images, colors, and others. Meanwhile, in the field, reading books are needed to get children used to listening to stories every day. The activity that children are currently enjoying is the Prasiaga Scout activity.

It can be concluded from the results of the pretest and interviews that children's abilities in visual-spatial intelligence are still not optimal, and the interview results show that there are limitations of storybooks, while children are very enthusiastic about digital media and Prasiaga activities. Therefore, a picture storybook with the theme of Prasiaga adventures, initially made of paper, became digital media. This is expected to stimulate intelligence because children are very enthusiastic about digital media. It is hoped that this can stimulate children's visual-spatial intelligence. Then the researcher took the initiative to create a digital storybook with the theme Prasiaga Scouts using the Canva application. The Canva application is recommended as a learning medium because it has various visual, audio, template, and integration with AI that can be combined to produce a picture storybook that is tailored to improve children's visual-spatial intelligence. This media can be downloaded so that it is easily accessible digitally to make it easier for teachers to access it.

B. Planning (*Design)*

The design stages of making a picture storybook product through steps As follows: (creating a storyline, searching for story references, searching for images in Canva's features, creating an image design with Canva combined with AI, recording sound, then inserting the appropriate text, images, and audio, which are inserted one by

one, after which it can be downloaded into a quality MP4 video format (1080p). The storybook consists of 25 slides with a duration of 6:03. The main function of this medium is to improve visual-spatial intelligence. The main focus remains the interaction between story text and still images typical of storybooks. The video here is just a digital medium so that the pages can move automatically and the text can be made sound without the need for physical printing.

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Table 12. Picture Storybook Content

No	Questions	Conclusion of Response
1	What kind of media is most needed to improve visual-spatial intelligence?	Children are happy with digital media because they have images, audio, and colors that look attractive. Can be displayed using mobile phones, laptops and others.
2	What are the obstacles that often occur when delivering material to children?	Limited knowledge and encouragement to create teaching media.
3	Have you ever heard of the scientific approach?	Ever, it is often done at outing class activities, watching videos or even just showing a picture.
4	How important is doing activities to improve early childhood visual-spatial intelligence?	It is important to do but the limited knowledge so it is often done through filling out LKA (Children's Worksheets) and playing blocks.
5	What kind of activities can improve visual-spatial intelligence with a scientific approach in early childhood?	Because of the activity that the children are enjoying, namely Prasiaga Scouts, and a storybook is needed, a picture storybook was made with the theme of Prasiaga's adventure.

Based on the table above, illustrated storybooks are made with visual elements such as covers, contents, and covers. In the cover section, the initial conditioning of the problem depicts the story of Lisa and Bimo. Meanwhile, in the content section, illustrations of images and stories are adjusted to the needs of recognizing visual-spatial intelligence indicators, recognizing colors from geometric shapes, recognizing patterns by looking for traces and tracing the path through the map. The scientific activities in the activities of observation (children pay attention to the pictures, colors, shapes contained in the storybook and pay attention to the audio narration), asking questions (children responding to questions in the stories conveyed by the teacher), collecting information (children find information from stories based on illustrations, narratives and text), reasoning (children can connect the content of images, audio, text to understand the content of the story) and communicating (children retell the content of the story simply). While in the closing there is a conclusion to the story and a thank you.

C. Development

The development stage in this study is a picture storybook. This book was developed differently from the original story book made of paper, while this can be accessed digitally. At the Kindergarten Institution in West Bandung Regency, the media of picture storybooks is displayed using *Interactive Flat Panels* so that the display of images and sounds can be seen and heard clearly by children. In addition, this storybook is flexible and can be displayed through mobile devices, laptops, or infocus projectors. The visualization of some of the pages of the storybook is presented as follows.

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Table 13. Chronology of Picture Storybook Development

Stages	Process	Results/Changes
Needs Analysis	Identify the child's learning media needs and visual-spatial abilities	Obtained media needs that are visually appealing and appropriate for the age of 5–6 years
Initial Design	Define themes, storylines, characters, images, colors, scientific activities, and visual-spatial intelligence indicators	Book Draft
Initial Products	Paper books developed into picture storybooks using Canva	Initial version produced
Media Expert Validation	Experts assess the appearance of colors, illustrations, sizes, designs, and child-friendly stories	Add intonation to the story so that the child can feel it
Subject Matter Expert Validation	Experts assess that story material encourages the development of visual-spatial intelligence indicators, material that is made according to what the child likes	Proportional matching between text and illustration to focus more on visual-spatial intelligence
Expert Practitioner Validation	Expert assesses language, story content, visuals, and colors	The use of language is more communicative and eliminates questions on barcodes
Revision I	Repair the product according to the validator's input	Revised version generated
Limited Trial	Books are used for 5 students	Known practicality and response to the media
Revision II	Improve products according to learners' responses to limited tests	Sharpen the narrative of the story on pattern and shape indicators
Final Products	Ready-to-use products in learning	Canva-assisted picture storybook with a scientific approach

The table above explains the chronological stage of development, which begins with the analysis of needs to the final product.

Table 14. Validation Results

No	Name validator	Score maximum	Score obtained	Percentage %	categories
1	Media member	28	26	92,8%	Higly worth it
2	Material expert	28	22	78,5%	Worthy
3	Practitioner expert	56	49	87,5%	Highly wort it

Based on the results of the validator's assessment, the highest quality of the instrument was obtained from media experts with a percentage of 92.8% so that it occupies a very decent category. The suggestions for improvement are that the content of the story and storyline are very good and in accordance with the visual-spatial intelligence indicators. However, insert questions in the story and add intonation to the story so that children can feel it.

Then, from the results of validity by material experts, it is stated that this illustrated storybook with a scientific approach has met the criteria with a score ranging from 3 (good) to 4 (excellent) or suitable for use with a percentage of 78.5%. However, there are still some things that need to be improved, namely the suitability of proportions between text and illustrations so that they focus more on visual-spatial intelligence. Meanwhile, the expert assessment of practitioners obtained a percentage of 87.5% which occupies the category

Tunas Siliwangi
JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

of very feasible. What must be improved is the use of language to be more communicative so that it is easier for children to understand and eliminate questions on barcodes.



Figure 2. Picture Storybook Cover

Figure 2 contains a cover page containing the title of the illustrated storybook, namely the adventure of Prasiaga Lisa and Bimo. The cover represents an image of the storyline that contains a brown, green and chicken coop.



Figure 3. Contents of a Picture Story Book

Figure 3 explains the pause button *in* the picture storybook which functions to temporarily stop the playback of the story, directly integrated as a built-in feature of the picture storybook media. In learning practice, the teacher is able to operate this feature by tapping the pause icon on the screen when there are questions in the story, class conditions are not conducive, or when they want to intersperse the story with a lighter question. If you want to continue, the teacher can simply press the same sign again on the screen.



Figure 4. Contents Page Know Color

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JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Figure 4 contains a display in the form of an interactive page about what colors students observed on the stones that Lisa and Bimo are looking for. This is made so that children do not get bored easily listening to stories.



Figure 5. Contents Page Know Patterns

The page 5 display contains an illustration of the depiction of the Bimo character who is actively running fast to continue the search mission. This activity led him to the discovery of patterns from various geometric shapes such as squares, circles, then continued with square shapes again.



Figure 6. Contents Page Know Shapes

Figure 6 shows a content page that focuses on the introduction of geometric shapes found by Lisa and Bimo, namely the gray circle shape. The way to maintain the enthusiasm of students to keep listening is to give an invitation to students to draw the shape with the excuse that they do not forget easily.



Figure 7. Contents Page Getting to Know the Map

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JURNAL PROGRAM STUDI PENDIDIKAN GURU PAUD
STKIP SILWANGI BANDUNG
TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Figure 7 contains a section about the map plan as Lisa and Bimo's guide to search for the lost chickens. According to estimates, the chickens disappeared to a place where there was a lot of leftovers from the traders, namely the field. The route to get to the field, Lisa and Bimo had to look and go through a pattern like a pink square followed by a gray circle, then another gray circle followed by a pink square shape.



Figure 8. Contents Page Getting to Know the Map

Figure 8 contains the repetition of the questions to ensure that the child focuses on listening to the story. This has the purpose of evaluating whether the child masters what he has watched as part of the observation.



Figure 9. Cover Page

Figure 9 contains the closing part consisting of positive reinforcement words and expressions of gratitude for helping and working together in Lisa and Bimo's journey to find the lost white chicken.

D. Implementation

Table 15. Limited Trials

	Descriptive Statistics				
	N	**Minimum**	**Maximum**	**Red**	**Std. Deviation**
Getting to know colors	5	2	4	3.20	1.093
Getting to know shapes and patterns	5	2	4	3.00	1.000
Get to know the map/ maze	5	2	4	3.20	837

From the table of 5 students, assessment data was obtained on the use of picture storybooks assisted by the Canva application with a scientific approach. This limited test was focused on evaluating the aspects of

TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

readability and ease of use. Based on the color readability indicator with a mean value of 3.20, which occupies the category with a standard deviation of 1.095. Furthermore, the ease of recognizing patterns and shapes with a mean value of 3.00 occupies the BSH category with a standard deviation of 1.000. Then, in the aspect of ease of recognizing maps or mazes, which is an average of 3.20, occupies the BSH category with a standard deviation of 0.837. Even though it is already in the BSH category, the observation results show that there are obstacles for practitioners in the indicator of recognizing patterns and shapes. As a follow-up step, product improvements were made to sharpen stories related to geometric shapes so that pattern recognition was easy for students to understand.

Table 16. Extensive Trials

Descriptive Statistics					
	N	Minimum	Maximum	Red	Std. Deviation
Getting to know colors	15	3	4	3.67	.488
Getting to know shapes and patterns	15	2	4	3.27	.799
Get to know the map/ maze	15	2	4	3.27	.799

Based on Table 16, the three indicators of child development were tested on 15 students. In the color recognition indicator, the highest score compared to other indicators, namely with an average of 3.67 with a standard deviation of 0.488 which occupies the BSB (Very Well Developed) category. Meanwhile, the indicator of recognizing patterns and shapes has the same average value as the indicator of knowing maps, which is 3.27 with a standard deviation of 0.799 which occupies the BSB (Very Well Developed) category.

E. Evaluation

Table 17. Wilcoxon Test

Posttest-Pretest	Ranks	N	Mean Rank	Sum of Rank
Posttest-Pretest	Negative Ranks	0[a]	.00	.00
	Positive Rank	15[b]	8.00	120.00
	Ties	0[c]		3.27
	Total	15		

Test Statistics
Posttest-Pretest

Statistik	Nilai
Z	-3.426
Asymp. Sig. (2-tailed)	0.001

Sumber: IBM SPSS 25 data output

The Wilcoxon test was taken by the researcher because it is included in a nonparametric statistical test that can be applied to see the average inequality of pairs. The Wilcoxon test is applied as another method of the paired sample t-test if the study data is not distributed normally. The hypothesis is that there is an effect of the use of Canva-assisted picture storybooks with a scientific approach on early childhood visual-spatial intelligence. The interpretation of the negative ranks output to see the increase from pretest to posttest, while ties show the similarity of values between the pretest and posttest. The basis for determining the decision is that if the sig. < level is 0.05 so that the hypothesis is accepted, and the sig. > level is 0.05 so that the hypothesis is rejected. The results of the analysis based on the table show that the negative ranks of the 15 children have no decrease, both from the mean ranks and the sum of ranks. Positive rank saw an increase from pretest to

TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

posttest from 15 students, the mean rank was 8.00 and the sum of ranks was 120.00. For ties, the exact same score was not present from 15 students. It can be concluded that from the statistical test table of test results, the significance value < 0.001, so the hypothesis is accepted. Thus, Canva-assisted picture storybooks with a scientific approach have an effect on the visual-spatial intelligence of children as young as 5-6 years old.

Discussion

A. Analysis

The analysis stage is carried out by looking at existing needs in the field to explore information on the availability or needs of media that will be created in order to stimulate children's visual-spatial intelligence more optimally. This development in indicators of recognizing colors, patterns and shapes as well as maps are some of the activities that educators are able to carry out so that they can be the initial foundation for the next level. There is a media needed, namely storybooks with digital images. Digital media can be a crucial trigger for early childhood learning activities (Kartika, 2023) .

B. Planning *(Design)*

At this stage, learning media is designed. This stage also designs learning activities, sets learning goals, designs learning tools and Instruments assessment. Activities designed for early childhood education learning by emphasizing relevant and conducive learning, of course, can keep up with the times (Azzahra et al., 2025). Learning media that is able to support the improvement of visual-spatial intelligence related to the recognition of colors, patterns and shapes and maps used is picture storybooks. Based on Faizah's research (Halim & Munthe, 2019), this media is liked by early childhood because it will demand imagination and encourage curiosity. Even though children are not yet able to read, children can understand stories through visual images and color combinations in pictures. This is corroborated by Arifudin's research (Sriyanta & Kartika, 2023) which mentions that the learning materials learned by early childhood are not limited to verbally, but are more diverse in the form of text, visuals, audio and others.

C. Development

The development stage is carried out by the researcher after maturing in the planning stage because it is realized to make a picture storybook. This book must be developed so that children do not get bored easily following the learning process. Based on research Dewanti et al. (2025), the Canva application is able to develop visual-spatial intelligence because it can motivate students to learn with various forms of attractive media with a selection of images and colors that are in harmony. Therefore, this book can be created through the Canva application. This research is not aligned with the study Ratnasari (2020) which states that conventional picture storybooks can develop visual-spatial intelligence. Previous studies applied a type of quasi-experimental research carried out on children aged 4-5 years and did not apply a scientific approach. Meanwhile, this study was made with the type of R&D development combined with the ADDIE model approach conducted on children aged 5-6 years. This media was formed through the help of the Canva application with a scientific approach. Approach Scientific carried out in various stages, namely observing, asking questions, gathering information, reasoning and communicating (Akromah & Rohmah, 2019).

D. Implementation

The implementation stage becomes a space to evaluate the media that has been created and implemented to students. The results of the development and application of learning to determine the influence on the quality of learning runs efficiently, effectively, and interestingly for children or not (Ibrahim Maulana Syahid et al., 2024). In this stage, the application of Canva-assisted picture storybook learning media with a scientific approach was carried out on a test limited to 5 students. The **Implementation Constraints** namely very bright classroom lighting that greatly interferes with image quality, diversion of children's focus, and obstacles to the narrative of the story for pattern and shape recognition. **Implementation of five scientific levels:** observing (children pay attention to the pictures, colors, shapes contained in the storybook and paying attention to the audio narration), asking questions (children responding to questions in the story delivered by the teacher), collecting information (children find information from stories based on illustrations, narratives and text), reasoning (children can connect the content of images, audio, text to understand the content of the story) and communicating (children retell the content of the story simply).

TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

The change after the limited test changed the faded secondary color to a clearer, more emphatic color so that when in a bright place it was still clearly visible and clarified the narrative of the story about patterns and shapes that focused on the recognition of square and circular geometric shapes with the AB-AB pattern.

E. Evaluation

The evaluation stage is used to measure or assess the product developed (Ayu & Manuaba, 2021). Based on the analysis of data from the posttest results, various child development achievements were found in each indicator. Unlike the color recognition indicator that obtained the highest score and experienced a significant increase, the indicator recognized patterns and shapes and map recognition occupied the lowest score even though it was in the BSB category.

Task complexity level Color recognition is categorized as an easy or low-level cognitive task because children only need one-way visual identification because they are directly visible to the eye. Recognizing shapes such as circles and squares requires understanding such as lines, angles, proportions of objects and others. Furthermore, pattern recognition is a more difficult stage because it requires concentration, logical skills, and memory. Then, for map or maze recognition, children must imagine space (right, left, front, top) so that planning is needed to solve problems to get to the desired destination. However, there is a development between before and after being given a picture storybook. Stimulation produces a positive influence on children's cognitive growth gradually (Fadhilah et al., 2026).

CONCLUSION

This research aims to make a picture storybook with the help of the Canva application in line with the needs of one of the kindergartens in West Bandung Regency applying the R&D method and ADDIE development model. The validation results showed that the product received a very feasible category from media experts (92.8%), feasible from material experts (78.5%), and very feasible from practitioners (87.5%). The implementation was carried out with a limited test on 5 children and a broad test on 15 children. The results of the pretest showed that the average value of the indicator of recognizing colors (2.47) occupies the category of Starting to Develop (MB), recognizing patterns and shapes (1.67) occupies the category of Not Yet Developing (BB), and recognizing maps or mazes (2.07) occupies the category of Starting to Develop (MB). Then for the posttest results, the value of color indicators (3.67), patterns and shapes (3.27), and maze (3.27) with the same category, namely Very Good Development (BSB). The results of the Wilcoxon test received an Asymp score. Sig. (2-tailed) of 0.001 (<0.05) proves that this picture storybook is significantly effective in fostering children's visual-spatial intelligence.

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