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Improving Vocabulary Skills Through Project-Based Learning with Digital Picture Media for Children with Speech Disorders in Third Grade of Elementary School

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Abstract Children with speech disorders experience difficulties in understanding and using vocabulary, which negatively affects their academic performance and social skills. Conventional verbal-based learning approaches are often ineffective for these children, requiring strategies that are more visual, concrete, and interactive. This research aims to improve the vocabulary skills of children with speech disorders using digital image media based on Project-Based Learning (PjBL). The study employed a Classroom Action Research (CAR) method conducted in three cycles in the 3rd Grade of YPPSB 3 Elementary School, North Sangatta. The subjects consisted of four students identified as having speech disorders. Data were collected through observation, learning outcome tests (pretest and posttest), and documentation of learning activities. The results show a significant improvement in students' vocabulary skills. The average pre-action score of 33.37% increased to 53.75% in cycle I, 67.5% in cycle II, and reached 75% in cycle III. Three out of four students (75%) achieved scores up to 98.75% and were categorized as "Developing Very Good" (BSB), while one student was categorized as "Developing Accordingly" (BSH). This improvement encompassed both receptive (listening, understanding) and productive (speaking, retelling) aspects. Digital image media provided concrete visual stimuli, while the PjBL approach encouraged student engagement and collaboration. The combination proved effective in creating an enjoyable, contextual, and inclusive learning experience for children with speech disorders.

Keywords: Vocabulary, Speech Disorder, Digital Image Media, Project-Based Learning, Elementary School

INTRODUCTION

Vocabulary skills are a crucial part of the language development process for children, especially for those with speech disorders. Good vocabulary ability affects language skills in children's communication and social interactions in their environment. Children who have difficulty communicating often face challenges in academic achievement (Azizah & Ulfatun, 2017). Vocabulary plays an important role in the learning process, particularly in the communicative relationship between teachers and students in the school environment. Good vocabulary skills help children understand, recognize, and use words correctly when speaking or telling stories (Tifani, 2020). The richer the vocabulary children have, the more skilled they are in expressing themselves. Therefore, efforts are necessary to expand children's vocabulary as a fundamental aspect of language skills development (Erviani, 2015).

Based on research conducted by Hikmah et al. (2024), children's language development remains relatively low. The data show that only 38.46% (5 children) have started to develop their language skills, while 61.53% (8 children) have not shown significant progress. Similarly, Arsini (2022) found that language learning is suboptimal, resulting in students not understanding the meaning of vocabulary, so their mastery level remains deficient. This indicates that, overall, students have not achieved optimal vocabulary mastery. Speech disorders can hinder their ability to produce sounds and communicate according to their age. Children are said to experience speech delays if the development of their speech skills is below their age average (Nurfadillah et al., 2022). Appropriate stimulation plays an important role in the development of children's language skills. The role of adults in guiding and accompanying children is very important to help them communicate more effectively and support their academic and social development. Children with speech disorders exhibit striking and different behaviors compared to typical children, especially regarding communication. Difficulties in speaking clearly, obstacles such as stuttering, poor articulation, language difficulties, and voice disturbances can affect children's learning outcomes (Nurfadillah et al., 2022). This condition causes them to prefer solitude and often daydream, both during classroom lessons and socializing with friends during school breaks. They also face obstacles in literacy skills, where their ability to read and write is still limited.

In the elementary school environment, children with speech impairments tend to be passive in learning, especially when reading in class and in the library. Their communication is dominated by non-verbal gestures, such as nodding or shaking their heads to express approval or rejection and pointing to objects they want rather than communicating verbally (Nurfadillah et al., 2022). Difficulties in understanding teachers' instructions also make them less responsive and more prone to daydreaming during lessons. This lack of engagement hinders their vocabulary mastery, which should develop through active interaction and communication.

A more interactive and engaging learning approach is key to helping them develop vocabulary comprehension. Efforts at school, such as a personal approach and emotional support from teachers and classmates, have had a positive impact. However, more innovative learning strategies are still needed to increase children's involvement. The use of media in teaching and learning activities has been proven effective in increasing children's engagement. Learning media serves as a communication tool in the learning process, making material delivery easier for students to understand. Additionally, using learning media can innovate material presentation so it is not only text-based, which often causes student boredom (Isnaeni & Hildayah, 2020).

Conventional methods, such as textbook use in learning, are often less engaging and less effective for students, especially for children with speech impairments. Text-based materials can quickly bore students and hinder

vocabulary mastery. Children with speech impairments need a more interactive and visual approach to help them recognize, understand, and remember vocabulary better. Children learn more easily through visualization, so using more interesting media, such as digital images, is an effective solution for improving their understanding. Smaldino et al. (2011) state that visual media can aid children's learning, while Supriyadi (2023) emphasizes that this media strengthens mastery of learned material and improves students' memory. In vocabulary learning activities, picture media is an effective tool for children with speech disorders.

In the classroom, children with speech disorders often experience decreased participation and engagement. They tend to seem disinterested or hesitant to speak, resulting in low social interaction and less productive learning. Consequently, the development of their vocabulary and communication skills is further hindered. One contributing factor is the use of less engaging media in learning activities. Kartini et al. (2024) note that conventional media such as books quickly bore students and reduce enthusiasm because they only present static content without dynamic visual stimuli. Therefore, updating learning media strategies to incorporate more interactive approaches is necessary to increase participation among children with speech disorders. Efforts aim to support students' vocabulary development and creativity by combining image media with Project-Based Learning methods. Research by Isman et al. (2022) indicates that this combination positively impacts students' learning outcomes and writing skills, closely related to creativity and vocabulary mastery.

In writing, children need diverse vocabulary to express their ideas clearly. Therefore, applying picture media in learning helps them understand new words while boosting their confidence and ability to express ideas more effectively. Through innovative and experiential approaches, children with speech disorders can learn more effectively and acquire better language skills to support their everyday communication. Continuing this discussion, Classroom Action Research (CAR) is an appropriate strategy to address vocabulary problems in children with speech disorders. The CAR model involves a cycle of planning, implementation, observation, and reflection. Teachers plan learning using project-based digital image media, conduct lessons, and observe students' vocabulary mastery progress. Observation results are analyzed to inform subsequent steps ensuring the approach effectively improves children’s abilities.

Recognizing the importance of developing vocabulary skills for elementary school children with speech disorders, this research aims to explore the effectiveness of using project-based digital image media to improve children's vocabulary skills. This approach is expected to create a more inclusive, interactive, and enjoyable learning environment. Thus, this research is anticipated to contribute to developing more effective learning methods and provide new insights on supporting children with speech disorders in

enhancing vocabulary skills. Moreover, it will reinforce the importance of using visual media in children's education, especially in today's digital era.

RESEARCH METHOD

This research used quantitative and qualitative methods with a Classroom Action Research (CAR) approach. CAR is research conducted by teachers that focuses on real problems encountered in the classroom. The purpose was to solve these problems and gain scientific understanding of the causes and how they could be addressed through specific actions (Salim, 2019). CAR was chosen because it provided in-depth insight into the challenges faced by students with speech disorders in vocabulary mastery. By using project-based digital image media, the research aimed to create a more interactive and engaging learning environment so that students could participate actively in the vocabulary learning process. The study tested and measured the effectiveness of digital image media in improving the vocabulary skills of children with speech disorders. Through the CAR action cycle, the research sought to identify the most effective strategies to help students better understand and use vocabulary. It focused on evaluating how the use of digital image media helped students understand, remember, and apply new vocabulary in daily communication. The research implemented a project-based learning model centered on enhancing vocabulary skills through digital image media for children with speech disorders in grade III of elementary school. The research design followed the Classroom Action Research cycle based on the McTaggart approach, which involves four main components. The stages of the CAR model are illustrated in Figure 1:

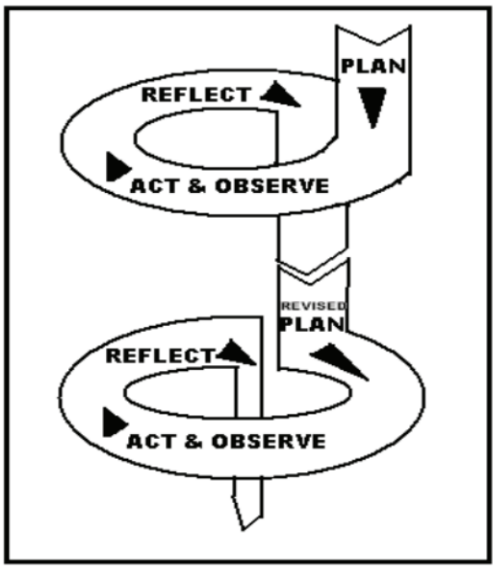

Figure 1. PTK Pratiwi Cycle (2021)

The CAR Kemmis and McTaggart models were chosen because researchers can play an active role in every stage, starting from planning, action, observation to reflection.

1. Planning: At this stage, various research instruments are prepared, such as observation sheets for the Project Based Learning model, student observations, and learning and evaluation tools to measure student learning achievement.
2. Implementation (Action) and Observation (Observation): The activities carried out are conscious and planned, aiming to increase students' understanding of the application of learning models. During the implementation, observations are made to collect information about the learning process, record the strengths and weaknesses of teachers, which will be used as reflection material for improvement planning in the next cycle.
3. Reflection: At this stage, an analysis is carried out on the results or impact of the actions that have been carried out, based on the observation sheet filled out by the observer. This reflection is important to determine the next step, whether learning needs to be continued in the next cycle or stopped if it has reached the set targets according to the success indicators.
4. Revised Plan: A plan prepared by the teacher based on the results of reflection from the previous cycle will be applied in the next cycle, to ensure continuous improvement in the learning process.

Data collection techniques included:

1. Observation Method

Observation plays an important role in recording the impact of actions taken during the research. According to Rifa'i (2020), observation is the process of observing and recording facts found during activities. In this research, observation was used to directly observe the learning process with project-based learning-based digital image media to improve vocabulary skills in children given to teachers. The instruments used include observation sheets for the use and implementation of learning. Observation is carried out systematically by the Principal as an observer. The steps include collaboration with teachers, pretesting before learning, observing the learning process, and administering posttests to measure the improvement of students' vocabulary. The results of observation are the basis for assessing the effectiveness of learning and determining improvement steps in the next cycle if the learning target has not been achieved.

2. Test Method

The test method was used to assess students' learning achievements on students' vocabulary ability to communicate before and after using digital image media. In this method, students are given learning outcome tests (pretest and posttest) to measure the subject's understanding before and after the learning process is carried out to assess student learning outcomes in this class action research.

3. Documentation

Documentation is a method of data collection that is carried out by recording or taking pictures of learning activities that occur in the classroom. This documentation is used to reinforce the results of observations made in the classroom.

The data in this research was obtained through observation sheets, field notes during learning, and learning outcome tests consisting of pretest and posttest. The data analyzed in this research is quantitative data that aims to see the level of success of students in mastering vocabulary after participating in digital image media-based learning through the Project based learning (PjBL) approach. The analysis technique was carried out by giving a check mark on the linker scale column of assessment 1 to 4, in accordance with the criteria on the observation instrument and the learning outcome test. Next, quantitative data is analyzed through the conversion of scores into percentage forms using the formula:

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

Q: the percentage to be searched,

f: the number of children who experience an increase

N: the number of all children observed.

Once the value is obtained, the results will be converted into vocabulary value categories according to the following range:

Table 1. Achievement Percentage Category

Achievement Percentage	Category
0–25%	Not Yet Developed
26–50%	Start Growing
51–75%	Growing Up With Expectations
76–100%	Very Well Developed

By comparing the pretest and posttest data that have been categorized, the researcher can assess the extent to which the improvement in children's vocabulary skills occurs after being given an action. To analyze the magnitude of the average increase in vocabulary ability from the beginning to the end, the formula is used:

$$\Delta\overline{X} = \overline{X}\ last - \overline{X}\ first$$

$\Delta\overline{X}$: Total average increase in vocabulary skills

$\overline{X}\ last$: Average score in the last cycle

$\overline{X}\ first$: Average score in the pre − cycle

This formula is used to quantitatively find out the extent to which the child's vocabulary ability improves after getting the learning designed in the action cycle.

RESULTS AND DISCUSSION

1. Analysis of Pre-Action Results

At the pre-action stage, the vocabulary ability of children with speech barriers still shows relatively low achievements. Based on the data obtained, as many as three students (75%) were categorized in the Started Developing (MB) stage, and one child (25%) was in the Developing According to Expectations (BSH) category. There were no students who reached the Very Good Developed (BSB) category or who were still lagging in the Not Developed (BB) category. This condition illustrates that most students are not able to master vocabulary optimally, both in the form of oral and written expressions. This requires a more systematic, adaptive learning approach that touches on aspects of individual characteristics of children, especially those who have special needs in language. The background of this low achievement is strongly influenced by the limitations of the learning media used previously, the low visual stimulus that supports word representation, and teaching methods that have not accommodated the visual-auditory learning style commonly possessed by children with speech disorders.

Findings at the pre-action stage are in line with a behavioristic approach that emphasizes the importance of stimuli from the environment in children's language development (Safitri et al., 2023). The lack of use of visual media as a stimulus in teaching can be one of the causes of children experiencing obstacles in understanding and remembering vocabulary. Anifa and Muryanti (2024) also suggested that children who were consistently given visual stimuli tended to show significant improvements in terms of vocabulary recognition and comprehension. Bruner's statement (in Setiyadi, 2013) also explains that visual media makes it easier for children to understand concepts concretely and gradually, especially for children who are not able to think abstractly. Therefore, the low vocabulary achievement in pre-action reflects that the approach and learning media used have not fully supported the acquisition of language for children with special needs optimally.

2. Evaluation of Cycle I Results

After the implementation of actions in Cycle I which applied digital image media in PjBL (Project Based Learning)-based learning, results were obtained that showed an improvement although not significant. A total of two students (50%) remained in the Starting Growth category, while the other two children (50%) reached the Developing as Expected category.

No child has reached the Very Good Developed category, the decrease in the number of children in the MB category from three children to two children indicates the beginning of positive change.

To get maximum improvement, an analysis of the implementation of the first cycle in the field is carried out, there are several factors that affect the low progress, including:

1. The child's lack of focus is due to the lack of children's energy distribution before the core of learning.

2. The lack of conducive classes is due to the enthusiasm of children with new learning media.

At this stage, it shows that although digital image media has succeeded in attracting children's attention, a more targeted strategy is still needed in managing the transition between the initial activities and the core learning activities.

The findings of this first cycle are in accordance with the statement from Bruner (in Setiyadi, 2013), who emphasized that visual media plays an important role in helping children build understanding gradually. However, the effectiveness of these media is highly dependent on the physical and emotional readiness of students and a supportive learning structure. In this stage, the emergence of high enthusiasm from children for new media needs to be addressed with proper management, so as not to interfere with learning concentration.

This view is in line with the statement of Zativalen, Irmaningrum, and Husna (2022), who stated that the implementation of Project-based learning requires effective classroom management because it involves the active involvement of students in completing projects and exploration. Based on this, it is necessary to adjust strategies in the next cycle, such as providing time for initial activities that allow children to channel energy, as well as introducing learning media gradually before entering core learning, so that the classroom atmosphere is maintained and learning goals are optimally achieved.

3. Developments in Cycle II

Cycle II was carried out as a form of evaluation and improvement from the previous stage. Adjustments to the strategy are made by adding ice breaking activities at the beginning of learning to help channel children's energy and improve focus, the instructions given are more directed and instructions are repeated for children in need, setting the rhythm with short breaks so that the child stays focused. Scheduling more close meetings is also chosen so that the feedback provided is immediate and does not require too long a pause. The results of this action show a significant improvement. There are no more students in the MB category. Three children (75%) have made it to the Performing Well category, and one child (25%) has entered the Performing Very Well category. This shows an increase from the previous cycle.

Researchers also found that in learning non-cognitive aspects such as confidence, boldness of speaking and participation in class discussions were improved. The results of this research reinforce the statement made by Azizi et al. (2023), that a project-based learning approach can increase students' social and emotional engagement because the learning process takes place in contextual situations and close to their real experiences. In addition, Setyawan, Purwanto, and Sari (2019) explained that the Project based learning model provides opportunities for students to grow comprehensively, including

academic aspects as well as communication skills and confidence development.

4. Optimal Achievement in Cycle III

Cycle III is the peak stage of the series of actions that have been carried out in this research. In this cycle, all students showed optimal development. A total of three children (75%) managed to achieve the Very Good Development category, and one child (25%) was in the Developing as Expected category. There are no more students in the low category (BB or MB). This improvement indicates that the learning strategies that have been refined in this cycle are effective in improving vocabulary mastery.

This achievement is supported by two main aspects, namely the use of interactive digital image media and the application of the Project based learning (PjBL) approach. Digital image media stimulates children's various senses, such as sight and hearing, thus helping them to connect between images and words. This makes it easier for children to understand the meaning of words and remember them for a longer time. This view is in line with the opinion of Jumiati, Rahakabauw, and Budiarti (2022), who explain that the use of digital images in learning can help clarify the meaning of words and support the process of language mastery, especially for children who experience barriers in communication.

The project-based learning approach applied in this research provides opportunities for children to learn actively through experiences that are in accordance with daily life. The activities carried out are not only academically meaningful, but also encourage children to be involved in the process of thinking and solving problems. In line with Azizi et al. (2023) who stated that the Project based learning model not only has an impact on improving cognitive abilities, but also strengthens social and communication skills through meaningful collaborative activities. In this research, students not only showed the ability to recognize and pronounce vocabulary correctly, but they also began to apply it in various daily situations, such as when playing with friends, telling stories, or interacting in group activities.

5. General Reflection from Pre-Action to Cycle III

Developmental data obtained for vocabulary skills from pre-action to Cycle III showed progressive, consistent and significant improvements. This improvement shows the success in the application of digital image media based on the Project based learning (PjBL) approach to maximize children with speech disorders to develop their vocabulary skills.

In the pre-action stage, the average child's vocabulary ability was 48.94%, which is included in the category of Starting to Develop (MB). After the intervention in Cycle I, the average score increased to 54.53% (Developing as Expected). A higher increase occurred in Cycle II, with an average of 75.31%, and finally reached 82.31% in Cycle III with the Very Well Developed (BSB) category. These developments can be summarized in the following table:

Table 2. Average Development of Children's Vocabulary Abilities at Each Stage of Action

Phase	Average (%)	Categories Development
Pre-Actions	48,94%	MB
Cycle I	54,53%	BSH
Cycle II	75,31%	BSH
Cycle III	82,31%	BSB

The average increase from the beginning to the end of what when calculated is 33.37%. Thus, the total increase from pre-action to cycle III was 33.37% which signified a very significant improvement in the child's vocabulary mastery after three cycles of action. The results can be seen in Figure 2:

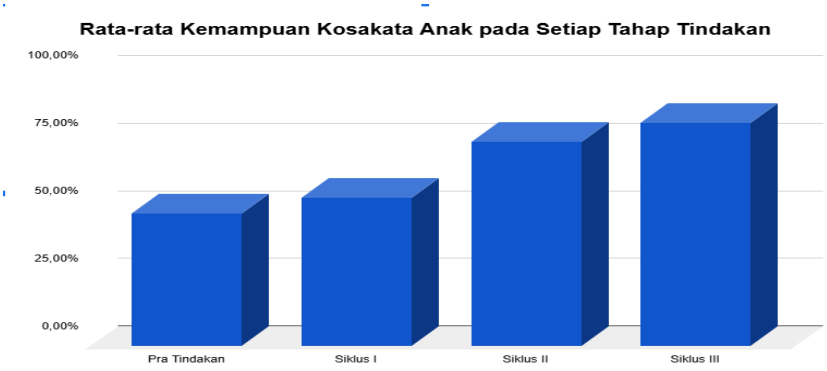

Figure 2. Average Development of Children's Vocabulary Abilities at Each Stage of Action

development of vocabulary skills is also reflected through changes in the distribution of developmental categories. At the pre-action stage, as many as 75% of students were in the MB category and only 25% achieved BSH. After the implementation of digital image media-based strategies in the PjBL model, there was a significant shift in Cycle III, where 75% of children reached the BSB category and 25% were in BSH, with no one left behind in MB or BB as shown below:

Table 3. Distribution of Categories of Child Vocabulary Ability Development at Each Action Stage

Category	Pre-Actions		Cycle I		Cycle II		Cycle III	
	F	%	F	%	F	%	F	%
BB	0	0	0	0	0	0	0	0
MB	3	75%	2	50%	0	0	0	0
BSH	1	25%	2	50%	3	75%	1	25%
BSB	0	0	0	0	1	25%	3	75%

Overall, the change from pre-action to Cycle III reflects that the PjBL-based digital image-based approach has succeeded in improving children's vocabulary skills consistently, gradually and effectively. This is in accordance

with the statement of Sundayra (2019) that children's vocabulary can develop optimally when they are given meaningful visual stimuli and associated with direct experience and use appropriate learning media. This shows that the use of digital images not only attracts children's attention, but also helps build connections between words, meanings, and direct experiences in a more profound way.

The project-based learning approach also contributes to creating an active, fun, and meaningful learning atmosphere, according to the explanation from Setyawan, Purwanto, and Sari (2019), that the PjBL model encourages student involvement in authentic activities that are relevant to their lives, thereby supporting overall language development.

Thus, it can be concluded that the combination of digital image media strategies and the PjBL approach has proven to be effective in gradually and sustainably improving the vocabulary skills of speech-impaired children. The results can be seen in Figure 3:

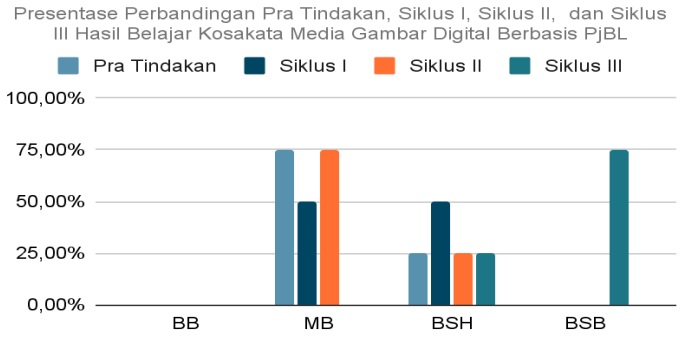

Figure 3. Distribution Graph of Children's Vocabulary Ability Development Categories at Each Action Stage

CONCLUSION

Based on the results of the implementation of Classroom Action Research (CAR) conducted through pre-action stage and three systematic cycles, this research successfully demonstrates that the integration of project-based digital image media with Project-Based Learning (PjBL) approach significantly improves vocabulary skills in students with speech disorders in grade III elementary school, as evidenced by the progressive increase in average scores from 48.94% (MB category) in pre-action to 82.31% (BSB category) in Cycle III, representing a total improvement of 33.37% and achieving the research objective of creating a more inclusive, interactive, and enjoyable learning environment for children with communication barriers. The quantitative improvements were accompanied by qualitative changes including increased student participation in listening activities, enhanced confidence in verbal expression, and improved peer interaction, while the systematic implementation of visual stimuli through digital imagery combined

with contextual project-based activities proved effective in addressing the specific learning needs of students with speech disorders who typically struggle with abstract concepts and traditional text-based instruction. The research contributes to the field of special education by providing empirical evidence for the effectiveness of multimedia approaches in language development interventions and offers practical implications for educators working with speech-impaired students, suggesting that future research should explore the long-term retention of vocabulary skills acquired through this method, investigate the scalability of this approach across different age groups and types of speech disorders, and examine the potential integration of emerging technologies such as artificial intelligence and virtual reality to further enhance vocabulary learning outcomes for children with communication challenges.

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