JURNAL UPI

Indonesian Journal of Educational Research and Technology

IJERT Indonesian Journal of Educational Research and Technology

Journal homepage: http://ejournal.upi.edu/index.php/IJERT/

Implementation of Project-Based Contextual Learning Model in Building Science Literacy for Children Aged 4-5 Years

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ABSTRACT

This study aims to describe the project-based contextual learning model in building science literacy of 4-5-year-old children. The research was conducted at Kindergarten, for 3 months (May-July 2024). This research was descriptive qualitative research. Data collection methods were: interviews, observation, and documentation. The data analysis procedure consisted of data collection, data reduction, data presentation, and conclusion drawing stages. Next, for the data obtained to have validity and a degree of trust, we used data triangulation and checking on informants. The results of the implementation of contextual and project learning models were from the students' science literacy skills, namely critical thinking skills. In addition, creativity and independence also increased along with the implementation of contextual and project learning models. Various activities that have been carried out are tailored to the learning themes and topics being studied as well as to the Student Interest Session activities by presenting various alternative activities including science activities and the Pancasila Learner Profile Strengthening Project.

ARTICLE INFO

Article History:
Submitted/Received 18 Nov 2024
First Revised 20 Dec 2024
Accepted 17 Feb 2025
First Available online 18 Feb 2025
Publication Date 01 Mar 2025

Keyword:
Contextual,
Project,
Science literacy.

1. INTRODUCTION

The development of globalization places information in a very important and influential position in daily life. The ability to access information requires strengthening for this. This is in line with the Ministry of Education and Culture's program which means literacy, especially in schools. Literacy is not only the ability to read, write, and calculate (numeracy) but also literacy in science and technology (digital), finance (financial), culture, and citizenship. Henceforth, these six things are basic literacy and are referred to as the literacy dimension in the "Roadmap of the National Literacy Movement" and preparing a literate generation to face the challenges of the 21st century to become the ultimate goal of the school literacy boom. Science literacy is one of the dimensions that can foster children's thinking and creativity, and foster the character of people who care and are responsible for themselves, society, and nature (Firda, 2022). One of the skills in preparing the 21st century generation to master the development of knowledge, technology, and life skills is by providing basic knowledge of science literacy in early childhood (Anita *et al*., 2023).

Early childhood science literacy skills are still diverse and existing problems include low critical thinking skills where students still need direction to solve problems and independence that still needs to be developed. Science learning for early childhood, especially the learning model, is one of the alternatives in improving science literacy skills. Learning models that can be implemented are contextual and project learning models. A contextual approach to science learning will build knowledge, attitude skills, and experience through a scientific, systematic, and objective mindset through simple science process skills (Watini, 2019). The project learning method regarding the idea of the concept of 'Learning by doing', which is the process of obtaining learning results by doing certain actions by their goals, especially the process of mastering children about how to do a job on a series of behaviors to achieve goals.

A contextual learning model that presents learning that fully engages early childhood and connects with real and meaningful situations is in line with the project learning model where children are the center of learning. The contextual learning model is a learning strategy that emphasizes the process of full student involvement in finding the material they are learning and relating it to real-life situations. Thus, students are encouraged to be able to apply it in their lives (Afriani, 2018). Involving students in learning shows that students as a learning center are the core of the implementation of the project learning model. Through the application of this project learning model, students are faced with problems in daily life that must be solved in groups. The syntax of implementing the contextual learning model is carried out based on five strategies: Relating, Experiencing, Applying, Cooperating, and Transferring (REACT). The application of the REACT strategy. Contextual learning (CTL) has seven main components in its implementation, which are as follows: (i) constructivism, (ii) inquiry, (iii) questioning, (iv) learning community or learning community (Learning Community), (v) modeling, (vi) reflection, and (vii) authentic assessment (Afriani, 2018).

The Definition of the Project Learning Model is based on John Dewey's constructivist learning theory known as 'learning by doing'(Cahyaningsih & Aaron, 2023). Project-based learning is a learning activity that creates a product by solving problems. Furthermore, project-based learning has the effect of stimulating children's ability to explore problems in depth by conducting simple planning and research to find answers to existing problems (Hasni & Amanda, 2022). The learning objectives of this project are to improve student's learning experience in terms of strengthening learning motivation, work motivation, work habits, teamwork, collaboration skills, communication skills, creativity development, critical thinking leadership, self-discipline, decision-making, accessing and analyzing information from various

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

sources, the use of new technology, and others required in 21st-century skills. Project-based learning (PjBL) model provides opportunities for children to learn in groups in processing knowledge in each project learning activity as a form of character strengthening (Sari *et al*., 2023).

The steps of the project-based learning model were formulated (Cahyaningsih & Aaron, 2023). The procedure is as follows:

(i) Identify the basic questions (starting with the basic questions),
(ii) Project planning,
(iii) Create a schedule,
(iv) Monitor project progress,
(v) Test results (evaluation of results), and
(vi) Evaluate the experience).

The stages of the project learning model, are as follows:

(i) Open the lesson with a challenging question (start with the essential question),
(ii) Design a plan for the project,
(iii) Create a schedule,
(iv) Monitor the students and the progress of the project, and
(v) Assessment of the resulting product (assess the outcome).

The evaluation is carried out to assist educators in measuring the achievement of standards, play a role in evaluating the progress of each student, provide feedback on the level of understanding that students have achieved, and assist educators in developing further learning strategies. Product assessment is carried out when each group presents a product presentation in front of the other group in turn; and (f) Evaluation (evaluate the experience). At the end of the learning process, the educator reflects on the activities of the project that is being studied in jail. The process of reflection is carried out in the same way as the individual or the group. In this stage, students are asked to open their eyes to complete the project.

2. METHODS

The research methodology is qualitative. Qualitative research is a form of research that is intended to achieve the kind of phenomenon that is experienced by the research subjects. For example, behavior, motivation, actions, and perceptions, as well as holistic and descriptive forms are used according to a special context that is used in a general way. In this Kaili research, qualitative research which is used with the aim of learning is obtained from information in the form of descriptions that provide implementation of a project-based contextual learning model to build scientific literacy in children aged 4-5 years at Kindergarten Firdaus Percikain Iman, Kecamatan Parongpong, Kabupaten Bandung Barat, Indonesia.

This research uses a type of qualitative descriptive research that is intended to obtain information on the data from the phenomena of natural phenomena that occur as aids, namely understanding the implementation of a project-based contextual learning model to build scientific literacy in children aged 4-5, shown from Dain's perspective Individual assessment includes competency assessment. The design of observational research is used to assess and determine the behavior and interactions of students and the implementation of a project-based contextual learning model in a natural context which is integrated with research sub-focuses which are determined according to the needs.

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

2.1. Data and Data Sources

In this study, we used data and data sources. The data used in this study were quantitative. Qualitative data is a data presentation that provides a description of the theoretical explanation based on the problem under study in the field and explores it in the form of a report. The data needed was about the implementation of contextual learning models and projects in building children's science literacy aged 4-5 years. The data obtained was by conducting interviews with school principals and teachers.

In this study, we used 2 data sources, namely:

(i) Primary data source. Primary data was data collected through direct observation and interview methods obtained from sources or main informants. Primary data sources in this study were interviews with informants, the relevant informants were the principal and teachers. As well as observations made of group A students, aged 4-5 years. Primary data sources were recorded through written notes and photos.

(ii) Secondary data sources. Secondary data was data to complement primary data collected from graphic documents (notes, tables, and others), photographs or images, archives, and other sources. Additional data sources derived from written sources can be divided into sources of books and scientific magazines, sources from archives, personal documents, and official documents.

2.2. Data Collection Techniques and Procedures

Data collection techniques or methods are a very important way used to obtain and collect data and information needed in research:

There are three data collection techniques used in this study, namely:

(i) Interview. We conducted interviews with teachers related to the implementation of project-based contextual learning models. Interviews involve direct interaction between us and interviewees to gain a deeper understanding of their experiences, perceptions, and views. Thus, it can be concluded that an interview is a way of collecting data by dialogue or question and answer with people who can provide information. Therefore, the type of interview used by the research is a "guided interview", meaning that we ask questions by previously prepared guidelines.

(ii) Observation. Observation is one way to get any information from an event by observing directly. Forms of observation that can be used in qualitative, namely participant observation, non-participant observation, systematic observation, and experimental observation. We made direct observations of learners while they were engaged in activities using project-based contextual learning models building science literacy can be done systematically by using observation sheets that have been prepared previously. Observations included aspects such as the level of engagement, improvement of learners' abilities, their emotional responses and motivation as well as the teacher as a facilitator in developing learners' science literacy skills.

(iii) Documentation Study. We collected data from related documents, such as child development records, and test results before and after the implementation of project-based contextual learning models. This document analysis provided additional information about the development of children's science literacy and changes that occur after carrying out activities that implement project-based contextual learning models. The documentation study instrument referred to 4 documents, namely: Curriculum documents, Minutes of school meetings, Learning materials, and Learning evaluation reports.

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

2.3. Data Analysis Procedure

The definition of data analysis is an effort to systematically search and organize records of observations, interviews, and others to improve our understanding of the case under study and present it as findings for others. Meanwhile, to improve this understanding, the analysis needed to be continued by trying to find the meaning of the data collected. Qualitative data analysis appeared in the form of words and not a series of numbers. The data collected came from observations as well as interviews and was further processed through recording, recording, and typing, but qualitative analysis still used words that were usually arranged into expanded text. Data analysis was divided into three streams of activities occurring simultaneously. The three streams were (i) data reduction; (ii) data presentation; and (iii) conclusion drawing and verification.

(i) Data reduction. Data reduction is defined as the process of selecting, focusing on simplifying, abstracting, and transforming data emerged from field notes.

(ii) Data presentation (data display). Data presentation is an activity in which a set of information is organized. Thus, it gave the possibility of drawing conclusions and taking action. The form of presenting qualitative data can be in the form of narrative text in the form of field notes, matrices, graphs, networks, and charts. These forms combine the information arranged in a cohesive and easy-to-grasp form, making it easier to see what is going on, whether the conclusions are correct or otherwise re-analyze.

(iii) Conclusion drawing and verification. The final stage was drawing conclusions based on the data analysis. At this stage, we linked the findings that emerged from the data with relevant theories or existing frameworks of understanding. We brought implications of research results in a context that must be based on evidence and tested from the data collected. In making conclusions, the data analysis process was continued by looking for the relationship between what was done (what), how to do it (how), why it was done like that (why), and how the results (how is the effect).

Figure 1 Interactive model of qualitative data analysis (Miles & Hubermen).

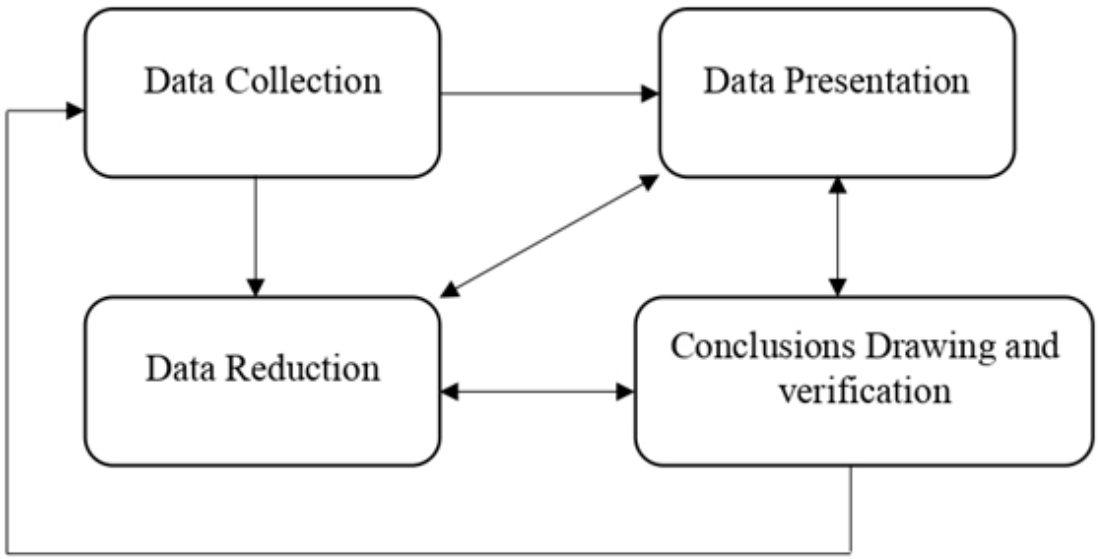

Figure 1. Interactive model of qualitative data analysis.

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

2.4. Data Validity Check

The validity of the research data uses triangulation techniques and checks on informants. The purpose of triangulation is to increase the theoretical, methodological, and interpretative power of qualitative research (Mekarisce, 2020). Meanwhile, informant checks are carried out through credibility tests, transferability tests, dependability tests, and confirmability tests. (Mekarisce, 2020).

3. RESULTS AND DISCUSSION

3.1. Implementation of project-based contextual learning model in building science literacy for children aged 4-5 years

The implementation of a project-based contextual learning model in building early childhood science literacy for ages 4-5 years, begins with planning activities from starting to determine the big theme, objectives, small committees, and steps of project implementation as well as context analysis and determining the resources and materials needed and providing insight to students about the project to be implemented. Planning is collaborative between educators and learners. Thus, participants are expected to feel ownership of the project. Planning contains the rules of the game and the selection of activities that can support answering important questions by integrating various supporting subjects and informing the tools and materials that can be used to complete the project.

The implementation begins with activities in the initial stage, then the development stage, and the conclusion stage with project introduction where activities explain the purpose, context, and steps of the project to students, and initial activities through discussion, presentation/brainstorming to start the project as well as evaluation and monitoring. Based on observations, the level of learner involvement is very high as seen from the activeness of students when participating in activities and they also show interest and focus during activities. The improvement of science literacy skills can be seen in the learners' ability to understand the literacy concepts being studied. Good curiosity is observed from the questions asked related to the theme being studied. Also supported by the exploration carried out and improved learning outcomes. During the activity, learners are enthusiastic and show motivation in learners to complete the activities that are being carried out. This is by the concept that pays special attention to students' involvement in the knowledge construction process, where they are not only passive recipients of information but also actively relate the subject matter to their own life experiences. Teachers who implement contextual learning models are expected to do more than just deliver facts or theories. They are invited to create a real connection between the teaching material and the students' real-world situations. Thus, learning becomes more meaningful and relevant to students, as they can see the direct application of what is learned in their daily lives (Magdalena *et al*., 2024). Contextual Teaching and Learning is a learning concept where teachers bring the real world into the classroom and encourage students to make connections between the knowledge they have and its application in their daily lives, while students acquire knowledge and skills from a limited context little by little, and from the process of constructing their own, as a provision for solving problems in their lives as members of the community (Lipiah *et al*., 2022).

Evaluation was carried out by determining indicators of success, participation from students, and how to optimize partnership involvement as well as conducting process and product assessments and presentation of results. At the end of the activity, they are allowed to communicate what their feelings are about playing science what tools and materials they use to conduct experiments, and what they observe during the experiment. At the end of the learning process, educators and students reflect on the activities and results of the project

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

that has been running. The reflection process is carried out individually or in groups. At this stage, students are asked to express their feelings and experiences when completing the project.

3.2. Obstacles and solutions to the implementation of project-based contextual learning models in building science literacy of 4–5-year-old children

Obstacles were found when there were internal ones, such as teachers not understanding the project activities carried out, and external obstacles, namely determining the right time because it involved partners. Other obstacles are inappropriate media and students' understanding/knowledge of the project and lack of experience or lack of knowledge of the science concepts being studied. This is because every learning media is used to support the teaching process or activities. Thus, the material discussed can be understood by students well and can also help teachers in the process of delivering subject matter. Learning media are all concrete or abstract objects used in the child's learning environment and with these objects, the child is helped to understand the lessons he learns (Rupnidah & Suryana, 2022).

Recommendations for the implementation of project-based contextual learning models in developing science literacy are determining projects that are reachable with children and based on children's interests and real contexts, where topics are relevant to students' lives and real. Thus, they feel the project is meaningful and use media that are more interesting and easily available. The right activities can also be carried out, namely hands-on activities, Student centers, and activities that involve two-way communication, experiments, nature-based projects, and educational visits. This is because the use of media not only makes the learning process more efficient but also helps learners absorb the subject matter more deeply and completely. When only listening to verbal information from the learner, the learner may not understand the lesson well. But if it is enriched by seeing, touching, feeling, or experiencing through the media, then the learners' understanding will be better.

The implementation of a project-based contextual learning model that can build science literacy has several impacts that can be observed from students, they are very enthusiastic and happy to do activities, feel happy, and have a strong interest in activities and they are involved/exploring what they did not know before. This concept pays special attention to students' involvement in the knowledge construction process, where they are not only passive recipients of information but also actively relate the subject matter to their own life experiences. Teachers who implement contextual learning models are expected to do more than just deliver facts or theories. They are invited to create a real connection between the teaching material and the students' real-world situations. Thus, learning becomes more meaningful and relevant to students, as they can see the direct application of what is learned in their daily lives (Magdalena *et al*., 2024).

3.3. Obstacles and solutions to the implementation of the project-based contextual learning model in building science literacy for children aged 4-5 years

The science literacy skills of students after activities that implement project-based contextual learning models are increasing and the enthusiasm of children in activities and getting to know new vocabulary and increasing their ability to recognize letters besides that they know science concepts better. Concept formation (Elaboration Phase) is carried out through exploration, formation, and stabilization of concepts until the questions in the curiosity stage can be answered.

The benefits obtained from the implementation of project-based contextual learning models in developing science literacy can be felt by students, namely increasing enthusiasm

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

and providing meaningful understanding. In addition, there are also benefits for teachers, namely increasing insight, increasing skills, improving teacher science literacy skills, improving critical thinking and problem-solving skills, improving communication and collaboration skills, increasing student motivation and learning engagement, and increasing creativity and innovation. The other benefits can provide knowledge/insight to students, through the process of observation, obtaining information and experiences that have an encouragement to explore and research their environment, provide pleasure, and provide a better understanding of the concepts and their benefits. This is to the opinion that science literacy in early childhood can develop various competencies such as critical thinking skills or being able to solve problems, being able to hone creativity through several science experiments, being able to communicate findings from observations or experiments orally, in writing and visually and being able to work together in a team when conducting science experiments (Anita *et al*., 2023).

3.4. Impact of the implementation of the project-based contextual learning model on the science literacy skills of 4-5-year-old children

The science literacy skills of students after activities that implement project-based contextual learning models are increasing and the enthusiasm of children in activities and getting to know new vocabulary and increasing their ability to recognize letters besides that they know science concepts better. Concept formation (Elaboration Phase) is carried out through exploration, formation, and stabilization of concepts until the questions in the curiosity stage can be answered.

The benefits obtained from the implementation of project-based contextual learning models in developing science literacy can be felt by students, namely increasing enthusiasm and providing meaningful understanding. In addition, there are benefits for teachers, namely increasing insight, increasing skills, and improving teacher science literacy skills, which can improve critical thinking and problem-solving skills, improve communication and collaboration skills, increase student motivation and learning engagement, and increase creativity and innovation. The other benefits can provide knowledge/insight to students, through the process of observation, obtaining information and experiences that have an encouragement to explore and research their environment, provide pleasure, and provide a better understanding of the concepts and their benefits. This is to the opinion that science literacy in early childhood can develop various competencies such as critical thinking skills or being able to solve problems, being able to hone creativity through several science experiments, being able to communicate findings from observations or experiments orally, in writing and visually and being able to work together in a team when conducting science experiments (Anita *et al*., 2023).

4. CONCLUSION

The implementation of activities is divided into the initial stage, the development stage, and the conclusion stage. The initial stage is through discussions to start the project, development activities according to learning objectives and student interests, and conclusions to evaluate students. Evaluation is carried out by determining indicators of success, participation from students, and how optimal partnership involvement is and conducting process and product assessments and presentation of results.

Obstacles are found when some come from internal and external Then several solutions are found. Thus, recommendations are made for the implementation of project-based contextual learning models in developing science literacy, namely Determining projects that

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

are reachable to children and based on children's interests and real contexts, Hands-on activity, Student centers, and activities that involve two-way communication, experiments, nature-based projects, and educational visits.

The implementation of a project-based contextual learning model that can build science literacy has several observable impacts on students, providing meaningful understanding. Can improve critical thinking and problem-solving skills, improve communication and collaboration skills, increase student motivation and learning engagement, and increase creativity and innovation.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

6. REFERENCES

Afriani, A. (2018). Pembelajaran kontekstual (cotextual teaching and learning) dan pemahaman konsep siswa. *Jurnal Al-Mutaaliyah: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, *3*(1), 80-88.

Anita, A., Rohimah, R., and Watini, S. (2023). Implementasi Model ATIK dalam Penguatan Literasi Sains pada Percobaan Kapilaritas di PAUD Ar Rayyan Parung Bogor PSP I. *JIIP-Jurnal Ilmiah Ilmu Pendidikan*, *6*(6), 3731-3737.

Cahyaningsih, S., and Harun, H. (2023). The effect of project learning method on children's critical thinking ability and creativity. *Journal of Obsession: Journal of Early Childhood Education*, *7*(5), 5481-5494.

Firda, A. (2022). Level of science literacy ability of early childhood education teachers. *Lancang Kuning University*, *6*(5), 3868-3876.

Hasni, U., and Amanda, R. S. (2022). Pengembangan model pembelajaran project based learning untuk meningkatkan kemampuan geometri anak usia 5-6 tahun. *Jurnal PG-PAUD Trunojoyo: Jurnal Pendidikan Dan Pembelajaran Anak Usia Dini*, *9*(1), 1-11.

Lipiah, D., Septianti, N., Yuwono, R., and Atika, R. (2022). Implementasi model pembelajaran kontekstual di sekolah dasar. *Tsaqofah*, *2*(1), 31-40.

Magdalena, I., Agustin, E. R., and Fitria, S. M. (2024). Konsep Model Pembelajaran. *Sindoro: Cendikia Pendidikan*, *3*(1), 1-10.

Mekarisce, A. A. (2020). Data validity checking techniques in qualitative research in the field of public health. *Public Health Scientific Journal: Public Health Community Communication Media*, *12*(3), 145-151.

Rupnidah, R., and Suryana, D. (2022). Media pembelajaran anak usia dini. *Jurnal PAUD Agapedia*, *6*(1), 49-58.

Sari, A. M., Suryana, D., Bentri, A., and Ridwan, R. (2023). Effectiveness of project based learning (PJBL) model in implementing Merdeka curriculum in kindergarten. *Basicedu Journal*, *7*(1), 432-440.

DOI: http://dx.doi.org/10.17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427

Watini, S. (2019). Contextual approach in improving science learning outcomes in early childhood. *Journal of Obsession: Journal of Early Childhood Education*, *3*(1), 82.

DOI: http://dx.doi.org/10. 17509/xxxx.xxxx
p- ISSN 2775-8419 e- ISSN 2775-8427