Proceedings Series on Social Sciences & Humanities, Volume 24
Proceedings of International Student Conference on Education (ISCE)
ISSN: 2808-103X

The Influence of Snowball Throwing Learning Model with Contextual Approach on Critical Mathematical Thinking Skills and Students' Self Confidence Grade VIII MTs Ma'Arif NU 1 Kedungbanteng

Devi Marsilia[1], Fitria Zana Kumala[2]
[1,2]Tadris Matematika, UIN Prof. K.H. Saifuddin Zuhri Purwokerto

ARTICLE INFO

Article history:

DOI:
10.30595/pssh.v24i.1624

Submited:
June 14, 2025

Accepted:
July 06, 2025

Published:
July 23, 2025

Keywords:

Critical Mathematical Thinking, Skills, Self-Confidence, Snowball Throwing Learning Model

ABSTRACT

This research is motivated by the critical thinking ability of mathematical and self-confidence of grade VIII students of MTs Ma'arif NU 1 Kedungbanteng which are still relatively low. The learning process that encourages the development of students' cognitive and affective abilities is influenced by the learning model used in the learning process itself. The purpose of this study was to analyze whether the snowball throwing learning model with a contextual approach has an effect on students' critical thinking ability of mathematical and self-confidence. This research is a field research using quantitative methods and an experimental approach. The population of this study was all 8th grade students totaling 161, with random sampling obtained 8th grade B as the control class and 8th grade D as the experimental class. The data analysis technique used the N-Gain test, normality test, homogeneity test, and t-test. Based on the results of the study, there is an influence of the snowball throwing learning model with a contextual approach on students' critical mathematical thinking skills and self-confidence. This is evidenced by the significance of the independent sample t-test on the average N-Gain value of 0.001 <0.05. The average N-Gain of the experimental class is 0.611 which is included in the fairly effective category and higher than the average N-Gain of the control class of 0.375 which is included in the ineffective category.

Corresponding Author:
Devi Marsilia
UIN Prof. K.H. Saifuddin Zuhri Purwokerto
JI. A. Yani No.40A, Karanganjing, Purwanegara, Purwokerto Utara, Banyumas Jawa Tengah 53126
Email: devimarsilia10@gmail.com

1. INTRODUCTION

Education is a lifelong learning process that helps individuals develop optimally. Education is the most important component in creating superior human resources. The quality of education is one of the important factors that determine the level of progress of a nation. This means that how advanced or developed a country is can be reflected from the quality of education it has. If the quality of education in a country is low, then the country is at risk of experiencing backwardness in various aspects of life (Kurniawati, 2022).

Mathematics is one of the fields of education that plays an important role in the world of education. Many things encountered in life are implementations of mathematics. Given the large role of mathematics in life, it is important for students to be equipped with mathematical abilities (Putri, 2020:6). One of the important indicators of the quality of education is the critical thinking skills and self-confidence of students.

In the context of mathematics learning, critical thinking skills are very important because they support students in analyzing, evaluating, and solving mathematical problems logically and systematically (Husna et al., 2022). As learners, students are expected to be able to develop critical thinking skills to solve contextual problems, namely problems that are directly related to everyday life situations.

This is in line with the goals of national education which encourage learners to be active in the learning process, where they are directly involved in every stage of learning activities. Students are required to have the ability to actively participate as part of achieving learning competencies. Active involvement of learners can be realized through various activities, such as discussions, presentations, or direct practice. To support this, a learning approach is needed that is relevant to the characteristics of the material.

One approach that can be applied is the contextual approach, which emphasizes the relationship between learning materials and students' real lives (Hamida et al., 2023). On the other hand, self-confidence also plays an important role in supporting students' learning success (Husain, 2021). Students with high self-confidence tend to be more active in the learning process, dare to express their opinions, and are not afraid to make mistakes. However, not all students have a high level of self-confidence.

Some students may experience a lack of self-confidence which is indicated by a reluctance to ask questions or express opinions related to the material that has been studied in class. They tend to feel inferior, afraid of making mistakes, and worry that their opinions will not be accepted or appreciated (Rais, 2022).

1.1 Understanding the Snowball Throwing Learning Model with a contextual approach

Etymologically, snowball means snowball while throwing means throwing. So Snowball Throwing as a whole can be interpreted as throwing snowballs. In the Snowball Throwing learning strategy, snowballs are paper containing questions made by students and then thrown to their friends to be answered. Learning with the Snowball Throwing model gives students the freedom to build or create knowledge by trying to give meaning to the knowledge they experience.

According to Komalasari (Rahmanianti, 2024), the snowball throwing learning model is a type of cooperative learning model. This learning model explores the leadership potential of students in groups and the skills of making and answering questions that are combined through imaginative games of forming and throwing snowballs. According to Setianingsih (Ayu Putri, 2023), the snowball throwing learning model is a cooperative learning approach where students work together in small groups to understand a particular concept or topic, then join a larger group to broaden students' understanding.

According to Widodo, the snowball throwing learning model is a modification of the questioning technique that emphasizes the ability to create questions that are packaged in an interesting game, namely throwing snowballs containing questions. Thus, it can be concluded that the snowball throwing learning model is a learning method that begins with the formation of groups represented by the group leader to get assignments from the teacher, then each group makes questions that are shaped like balls (question paper) and then thrown to other groups, where each group answers questions from the balls received. So that it raises students' courage in expressing opinions or answering questions asked by their friends.

The Snowball Throwing learning model with a contextual approach is a learning model that uses the steps of the Snowball Throwing model by linking the material to real life. The contextual approach is a learning concept designed to help educators connect teaching materials with real conditions faced by students. Through this approach, students are encouraged to relate the knowledge they have to its application in everyday life, so that learning becomes more meaningful and relevant.

1.2 Mathematical Critical Thinking Skills

Critical thinking is a mental process to analyze or evaluate information. The information can be obtained from observations, experiences, common sense or through communication media. According to Ennis (Hendriana, 2017), Critical thinking is reflective thinking that is reasoned and focused on determining what is believed or done. According to Screven and Paul and Angelo (Saputra, 2020), critical thinking is an intelligent disciplined process of conceptualization, application, analysis, synthesis and active and skilled evaluation collected from, or produced by observation, experience, reflection, reasoning, or communication as a guide to belief and action.

Thus, it can be concluded that critical thinking is a systematic process that allows someone to formulate and evaluate their own beliefs and opinions. In critical thinking all abilities are used, both understanding, remembering, distinguishing, analyzing, giving reasons, reflecting, interpreting, seeking relationships, evaluating, and even making temporary assumptions.

1.3 Self Confidence

Self-confidence is a positive belief that a person has in his/her ability to complete a task or face a certain situation well. According to Bandura (Hendriana, 2017), self-confidence is a person's ability to believe in themselves to do something that is necessary to achieve the desired results. According to Yulita Rintyastini and Suzy Yulia Charlotte, self-confidence is a positive attitude of an individual to feel competent, capable, confident and believe that he/she can develop a positive assessment of themselves or the environment or situations and

conditions they face. Thus, it can be concluded that self-confidence is an attitude or feeling of confidence in one's own abilities so that a person is not too worried about every action, can feel free to do things they like, and is responsible for their actions.

2. METHODS

This research is a quantitative experimental research that can also be characterized as random assignment. The term random assignment is used because the performance ofparticipation (objects, subjects, populations, or samples) is done in a completely random way, thus ensuring that all participation has the same probability of being selected (Sugiyono, 2019). In the context of this experimental research, students will be systematically categorized into experimental and control classes.

In the experimental group, students will be involved in observations using the snowball throwing learning model with a contextual approach. In contrast, students in the control class will participate in observations of conventional learning models. The research design used in this study is a non-equivalent pretest posttest control group design. The implementation is that in the initial stage, a test of mathematical critical thinking skills will be carried out before observing students.

After the observation is carried out, students will be tested again for mathematical critical thinking skills. The population of this study was all students of class VIII MTs Ma'arif NU 1 Kedungbanteng, totaling 161 students. Sampling was done using simple random sampling technique. Class VIII D was chosen as the experimental class and class VIII B as the control class. The data collection techniques used in this study were tests and questionnaires.

The instruments used were 4 essay questions to measure mathematical critical thinking skills, and a questionnaire consisting of 15 positive and negative statements to measure students' self confidence. Validity and reliability tests were conducted to ensure the quality of the instrument. The analysis prerequisite test used the normality test and the homogeneity test. While the hypothesis test used the N-Gain test, and the t-test used SPSS software.

3. DISCUSSIONS

The purpose of this study was to determine the effect of the application of the Snowball Throwing learning model with a contextual approach on students' critical mathematical thinking skills and self-confidence. The population in this study were all 161 students in grade VIII. Sampling using random sampling techniques obtained that class VIII D as the experimental class and class VIII B as the control class.

During the research process, class VIII D will be given a snowball throwing model treatment with a contextual approach as a learning method and class VIII B will be given a conventional learning method. In its implementation, the two classes used as samples will receive different treatments. In the experimental class, the learning process used is the snowball throwing learning model with a contextual approach. Then in the control class, the learning process uses conventional learning methods.

3.1 Application of the Snowball Throwing Learning Model with a Contextual Approach

Figure 1. The teacher gives an introductory exposition about the material on lines and various things in real life

Learning begins with an introductory stage, namely greeting and praying, asking for news and readiness of the learning process, checking student attendance. Furthermore, the core activity begins with an introduction to the line material and linking it to real life that is relevant to the material, at this stage encouraging students to have a positive self-concept. After that, the teacher divides students into four groups and appoints one from each group to be the group leader, this stage encourages students to be more confident in their own abilities.

The teacher explains to the group leader regarding the activity rules. After that, the group leader explains the rules to each group and begins to discuss making questions from the line material that are related to everyday life. At this stage, encourage students to be able to define the relationship between statements, questions, and concepts that will be used, encourage students to use the right strategy and make students more confident in their abilities. In this activity, students are active in discussing and also asking questions to find the information needed. The teacher is responsible for monitoring by guiding each group in turn if they experience obstacles.

Figure 2 The teacher monitors by guiding each group in turn

After all the questions that have been made by each group are collected. The next stage is the ball throwing stage where each group will throw it from one group to another with a time limit of ± 2 minutes, the group that receives the last ball will be given questions that have been made by other groups and work on them in front of the class, this activity aims to train students to use the correct solution strategy and increase student confidence and also hone their ability to express opinions in front of the class. This activity is repeated. After all have finished their presentations, the teacher gives appreciation to all students.

Figure 3 Throwing the ball

In the closing activity, the teacher reviews the material and guides students to conclude the material that has been studied. Independent assignments are given so that students are accustomed to and understand more about the material on lines and angles. The teacher then delivers the lesson material that will be explored in the next meeting, allowing students to prepare for it. The meeting ends with a prayer together and greetings. Based on the research that has been done, it can be concluded that, there is an influence of the snowball throwing learning model with a contextual approach on the critical mathematical thinking skills and there is an influence of the snowball throwing learning model with a contextual approach on the self-confidence of class VIII students of MTs Ma'arif NU 1 Kedungbanteng.

REFERENCES

Ayu Putri Lestari, Nyoman. dkk. Model-model Pembelajaran untuk Kurikulum Merdeka di Era Society 5.0, (Bandung: Nilacakra, 2023)

Hamida, H., Wiradendi Wolor, C., & Firdausi Rachmadania, R. (2023). Pengaruh Pembelajaran Berbasis Masalah Dan Pembelajaran Kontekstual Terhadap Kemampuan Berpikir Kritis Siswa Smkn3 Jakarta. *Berajah Journal*, *3*(1), 97–106. https://doi.org/10.47353/bj.v3i1.200

Heris Hendriana dkk, Hard Skills dan Soft Skills Matematik Siswa, (Bandung: PT Refika Aditama, 2017)

Husain, R. F. (2021). Perbedaan Kemampuan Berpikir Kritis Dan Pemahaman Konsep Matematis Siswa Dengan Menggunakan Model Pembelajaran Snowball Throwing Dan Snowball Drilling Pada Materi Program Linear Di Kelas Xi Sma Negeri 1 Kutacane. *Industry and Higher Education*, *3*(1), 1689–1699. http://journal.unilak.ac.id/index.php/JIEB/article/view/3845%0Ahttp://dspace.uc.ac.id/handle/123456789/1288

Husna, H., Herizal, H., & Wulandari, W. (2022). PENINGKATAN KEMAMPUAN BERPIKIR KRITIS MATEMATIS SISWA MENGGUNAKAN PENDEKATANCONTEXTUAL TEACHING AND LEARNING (CTL) PADA MATERI BANGUN RUANG SISI DATAR DI KELAS VIII MTsS SYAMSUDDHUHA ACEH UTARA. *Jurnal Pendidikan Matematika Malikussaleh*, *2*(1), 191. https://doi.org/10.29103/jpmm.v2i1.7439

Kurniawati, F. N. A. (2022). Meninjau Permasalahan Rendahnya Kualitas Pendidikan Di Indonesia Dan Solusi. *Academy of Education Journal*, *13*(1), 1–13. https://doi.org/10.47200/aoej.v13i1.765

Rahmanianti, Rita. Model-model Pembelajaran Inovatif, (Jawa Timur: Uwais Inspirasi Indonesia, 2024), hlm. 108

Rais, M. R. (2022). Kepercayaan Diri (Self Confidence) Dan Perkembangannya Pada Remaja. *Al-Irsyad*, *12*(1), 40. https://doi.org/10.30829/al-irsyad.v12i1.11935

Saputra, H. (2020). Kemampuan Berfikir Kritis Matematis. *Perpustakaan IAI Agus Salim Metro Lampung*, *2*(April), 1–7.

Sugiono. Metode Penelitian Kuantitatif, Kualitatif dan R&D.(Bandung: Alfabeta. 2019)