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Meta-Analysis of Constructivist Learning Models in Improving Student Learning Outcomes

Akhmad Syahid[1], Subaedah[2], Nurbaeti[3], Muhammad Arsyam[4]
[1] Universitas Muslim Indonesia: akhmad.syahid@umi.ac.id
[2] Universitas Muslim Indonesia: ubaedah.subaedah@umi.ac.id
[3] Universitas Muslim Indonesia: nurbaetisyahid@gmail.com
[4] Universitas Muslim Indonesia: arsyam0505@gmail.com

Keywords:
Meta-analysis, Learning constructivist, Learning outcomes.

Abstract

This article aims to revisit and find out to what extent the constructivist learning model is able to improve student learning outcomes. Learner learning outcomes are one indicator of the success of education in the cognitive domain, of course, supported by the learning model. The focus of research on the implementation of constructivist learning models can improve student learning outcomes in elementary schools. The research method and approach used is a descriptive qualitative meta-analysis by collecting several research results with document studies and research data derived from journals related to the implementation of constructivist learning models. The data collection technique used is non-test by searching E-journals via Google Scholar or Google Scholar as well as documentation studies conducted in the library. Searches obtained several articles and 9 theses, 1 thesis, and 1 dissertation related to constructivist learning models. The results indicated that the constructivist learning model was able to improve student learning outcomes with the lowest percentage of 21% to the highest of 53% with an average of 32.35%. So it is concluded that the implementation of constructivist learning models in the learning process based on E-journal searches through Google Scholar, Google Scholar, and documentation studies is effective in improving student learning outcomes.

Kata kunci:
Meta Analisis, Pembelajaran, Konstruktivis, Hasil, Belajar.

Abstrak

Artikel ini bertujuan untuk melihat kembali dan mengetahui sejauh mana model pembelajaran konstruktivis mampu meningkatkan hasil belajar peserta didik. Hasil belajar peserta didik merupakan salah satu indikator keberhasilan pendidikan pada ranah kognitif tentu ditunjang oleh model pembelajaran. Fokus penelitian pada implementasi model pembelajaran konstruktivis mampu meningkatkan hasil belajar peserta didik di sekolah dasar. Metode dan pendekatan penelitian yang digunakan yaitu meta analisis deskriptif kualitatif dengan menghimpun beberapa hasil penelitian dengan studi dokumen serta data penelitian yang berasal dari jurnal terkait dengan implementasi model pembelajaran konstruktivis. Teknik pengumpul data yang digunakan adalah non tes dengan menelusuri E-journal lewat Google Cendekia atau Google Scholar juga studi dokumentasi yang dilakukan di perpustakaan. Penelusuran diperoleh beberapa artikel dan 9 skripsi, 1 tesis, 1 disertasi yang terkait dengan model pembelajaran konstruktivis. Hasil penelitian mengindikasikan bahwa model pembelajaran konstruktivis mampu meningkatkan hasil belajar peserta didik dengan persentase terendah 21% sampai yang tertinggi 53% dengan rata-rata 32,35%. Sehingga ditarik simpulan bahwa implementasi model pembelajaran konstruktivis dalam proses pembelajaran berdasarkan penelusuran E-journal lewat google cendikia, google scholar, serta studi dokumentasi efektif dalam meningkatkan hasil belajar peserta didik..

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Corresponding Author:
Akhmad Syahid
Universitas Muslim Indonesia: akhmad.syahid@umi.ac.id

INTRODUCTION

Education is one of the efforts used in improving the quality of human resources (Abdussyukur, Mursyidi, Nicolas, Syarfuni, & Muflihah, 2023; B, Kardini, Elshifa, Adiawaty, & Wijayanti, 2023). One of the ways to obtain education is by following the Constructivist learning process at school. The constructivist learning process in schools is no longer centered on educators but on students. In addition, the learning process was initially carried out in a conventional way (lecture) and switched to the learning process with the implementation of a scientific learning approach (Chuang, 2021; Pande & Bharathi, 2020).

Education plays an important role in developing the potential of each individual. Through education, a person will be brave in facing and solving every problem, because education aims to help students develop their potential (Danchikov, Prodanova, Kovalenko, & Bondarenko, 2021). By taking the education level, students can avoid the inability of cognitive development (Dalkiran, Eryigit, & Sivri, 2020). Education is a differentiator between a person and other people, seen from the knowledge, abilities and skills they have so that they can improve their welfare (Arifin, Sutama, Aryani, Prayitno, & Waston, 2023).

Several studies conducted related to constructivist learning models used in the field of education and many published in the form of indexed or scopus journals, are also widely researched and written (Arik & Yilmaz, 2020; Garzón, Kinshuk, Baldiris, Gutiérrez, & Pavón, 2020; Subaedah, Wahab, Azhar, Sudarmono, & Zainal, 2023). However, further studies or meta-analysis of the research results in testing the effectiveness of the research results themselves. The research conducted used the meta-analysis method. Meta analysis is one of the structured research methods accompanied by data collection in calculating conclusions from several research results that have been carried out (Kobayashi, 2019). Researchers took several studies in accordance with the title in this study. This meta-analysis method is used by researchers to summarize some important things from the results of research that has been done.

Constructivist learning is a learning model whose implementation directs students to think critically, where in learning activities students are directed to be more active in identifying their own understanding of a problem (Cline, 2000; Mu'min, 2023). constructivist view of learning where teaching and learning activities focus on the activeness of students in understanding a concept or idea (Chen & Liu, 2021). The real learning process must involve students in problem solving so that it can develop the knowledge and skills of the students themselves (Fatimah, Asy'ari, Sandria, & Nasucha, 2023; Good, Maries, & Singh, 2022).

Constructivist learning is able to hone all the competencies of students in learning activities so that they are able to construct or develop thinking patterns systematically, critically, logically, analytically (Archambault, Leary, & Rice, 2022). The constructivist learning model also directs and involves students in the process of mental activities through exchanging opinions, with discussions, reading information from various teaching sources, or making their own observations and experiments (Berglund, 2017). In addition, constructivist learning hones students in developing creativity and

activeness through the process of finding, and investigating themselves, so that the results obtained last long in the memory of students so that they do not forget easily. The purpose of this study is to see the relationship between constructivist learning models in improving student learning outcomes (Coles, Owens, Serrano, Slavec, & Evans, 2015; Firdaus, Jamal, & Arifin, 2023; Susilawati, 2021).

METHODS

This type of research uses a qualitative descriptive meta-analysis method with a search research approach (survey), namely tracing and trying to summarize various research results with document studies used by researchers, namely 12 data related to the implementation of constructivist learning models. Data collection techniques using non-tests, namely by searching electronic journals through Google Scholar and Google Scholar and documentation studies in libraries using the keywords "Constructivist Learning", and "Learner Learning Outcomes in Elementary Schools". From the results of the search, 12 relevant articles were obtained that had been published, although some were published in journals that had not been indexed.

In conducting research, it has been explained above that this research uses a meta-analysis approach and type of research, so what needs to be considered first is: 1) Determining the research question (The researcher's question must be specific, well-defined, and can be answered by existing research), 2) Searching for relevant studies (searching databases and other sources relevant to the research question in the sense of a thorough search of articles or both published and unpublished, 3) Identifying studies that are considered relevant (filtering studies to be included in the analysis so that they can meet the inclusion criteria), 4) Data extraction (sorting out the extracted results including documenting the study design, sample size, intervention or exposure, outcome measures and results and must be standardized and conducted independently by more than two researchers), 5) Data analysis (combining individual study results using statistical methods and then determining which model to choose, 6) Interpretation of results (interpreting the meta-analysis by determining the overall effect size, level of heterogeneity, and limitations in the analysis, then the findings are presented by describing the results found).

Data analysis techniques using a qualitative descriptive approach in knowing the relationship between constructivist learning models and improving student learning outcomes. The analysis was carried out by comparing the difference in score scores before learning treatment using conventional learning models and after giving treatment to the learning process using constructivist learning models (Fitria et al., 2021). Furthermore, divided by the score before the treatment of constructivist learning models used in the learning process (in the form of %) with the aim of knowing the percentage of improvement in student learning outcomes in elementary schools (Anatasya, 2023).

RESULTS AND DISCUSSION

Result

The results of the research based on data analysis obtained nine articles taken from journals, one thesis, one thesis, and one dissertation related to the implementation of constructivist learning models in improving student learning outcomes in elementary schools. Furthermore, the data of articles, theses, theses, and dissertations are processed by summarizing and listing the results of research on constructivist learning models. Furthermore, all filtered data are re-analyzed by means of qualitative descriptive analysis. The following data are the results of research based on meta-analysis data related to constructivist learning models in improving student learning outcomes in elementary schools:

Table 1. Percentage of Improvement in Student Learning Outcomes

No	Responden	Improved Learning Outcomes Pree	Post	Gain	Gain %
1	AA	59,50	74,50	15,3	26
2	AB	64,63	78,75	14,11	22
3	AC	63,62	80,73	17,10	27
4	AD	62,40	81,64	19,24	31
5	AE	54,00	73,12	19,19	36
6	AF	63,50	88,70	25,20	40
7	AG	59,30	80,47	18,21	31
8	AH	63,5	88,70	25,20	40
9	AM	55,33	85,66	30,32	55
10	AN	56,60	83,00	26,40	47
12	AO	64,20	79,40	15,21	24
	Mean	60,66	81,11	20,20	34

Based on table 1 above, it shows that the constructivist learning model is able to improve the learning outcomes of students in elementary schools. The average percentage of improvement in student learning outcomes by using learning models ranging from the lowest 23% to the highest 56% with an average of 21%. The average learning outcomes of students before using the Constructivist Model were at a percentage of 61% then by providing treatment with the implementation of the constructivist learning model increased to 81%. The average value before and after constructivist learning with a significant increase of 34.12%. These results are in line with the results of research conducted by AD entitled "Meta Analysis of the Effect of Role Playing learning model on social studies learning outcomes". This study also showed the results that there was an increase in the critical thinking skills of different students with an average value ranging from the lowest 5.41% to the highest 30.2% with an average of 107.45%. With the percentage results after the analysis confirmed that there is a difference in the critical thinking skills of students before and after treatment is done. apart from the difference in critical thinking skills as well as understanding the concept of students so that learning outcomes can improve.

In general, twelve searches of research results show that the implementation of learning models is very effective in improving students' cognitive abilities, improving critical thinking skills, increasing students' concept understanding, and also honing students' skills in the psychomotor domain. The utilization of constructivistic learning models based on the results of the analysis provides an understanding that the relationship between educators and students (educator and learner interaction) with the implementation of learning models is closely related. The improvement of the cognitive domain, affective domain, and psychomotor domain of students is very dependent on the conditioning of the class/room in the learning process. Learning is an interaction process that involves educators and students with the use of various learning models, especially constructivist learning models in constructing understanding to improve student learning outcomes. Referring to the research discussion is certainly in line with Bruner's opinion that the constructivist learning model is very useful in increasing the intellectual potential of students.

Based on the search results, it can be seen that each study obtained different results in improving learning outcomes. This is also in line with the opinion of experts that improving learning outcomes is also influenced by internal factors and external factors. Where internal factors are factors that come from within students such as: health, mood, interest, talent, intelligence, while external factors come from outside students such as learning atmosphere, parents, facilities and infrastructure, home atmosphere, family economy, curriculum educators, learning process, social relationships between educators and students, students and students, school conditions.

The search results also show that the differences in research results that have been carried out by these researchers are caused by internal factors (from within) and external factors (from outside). The background of the research place also affects the research results obtained because they come from different regions. The level of cognitive abilities of students is also different. Some of these points certainly affect the improvement of learning outcomes obtained by students. The health condition of students is also one of the factors that greatly affects the improvement of learning outcomes. In addition, the learning process carried out by educators even though it uses the same type of model or method, the implementation may be different so that the improvement of learning outcomes is different for each student.

Discussion

Based on the results of the research on the percentage calculation above, the average increase in student learning outcomes by using learning models ranging from the lowest 23% to the highest 56% with an average of 21%. The average learning outcomes of students before using the constructivist model were at a percentage of 61% then by doing or giving treatment with the implementation of the constructivist learning model was able to increase to 81%. This proves that the average value before and after constructivist learning has increased significantly by 34.12%.

The interpretation table of the amount of data analysis results obtained is included in the high category, of course, indicating that there is a relationship between

the learning model and the improvement of student learning outcomes. In the learning process, the learning model determined and selected and implemented by educators is very effective in improving the final results obtained by students. Based on the description of the research results traced above, the description in the discussion is interpreted that the relationship between the implementation of the use of constructivist models and the improvement of student learning outcomes is very closely related. The selection of the right model is also one of the factors that can influence the activities of students in every activity of the learning process, so that the interest, willingness, enthusiasm, tenacity, persistence of students will be a benchmark for improving learning outcomes.

One of the learning models that can be selected and implemented in the learning process by educators is the constructivist learning model, because by using the constructivist learning model, each learner in the class is required to carry out activities by developing knowledge, constructing or building thoughts through their experiences and prior knowledge, then exchanging ideas to find the most appropriate answers in the group and presenting the answers that have been agreed upon in the group, with this the learners are not bored, not saturated during the learning process because. Learners are also directed to work in groups so that the interaction between learners and learners will be well established feels definitely fun for the learners themselves (Rosyidi & Rosikh, 2022). The use of constructivist learning models has a very positive influence because in the learning process students because the constructivist model provides an opportunity to exchange ideas, that way students will get better knowledge and each student will help each other, not only exchanging ideas students will also determine the most appropriate answer in their group, so that in this case it will foster a sense of responsibility owned by students (Komariah & Nihayah, 2023).

This analysis is supported by the findings of research conducted by AA in the use of cooperative learning type Numbered Head Together where students will directly be able to solve problems, understand the material in groups and can help students who can work together with each other. make conclusions and present in front of the class as an evaluation for learning activities that have been carried out, the activeness of students in learning activities using constructivist learning models proves effective in improving student learning outcomes. This is because during the learning process students in learning activities are directly involved, students will be more enthusiastic in the process of learning activities.

Education is important in human life. Through education a person can gain complex knowledge. A nation can prepare better human resources to build a better nation. One of the efforts made in building good human resources is through improving the quality of education in Indonesia. The constructivist learning process starts from the assimilation process stage (the process of integrating new information into existing cognitive structures in the mind) then the next stage is the accommodation process (the process of adjusting cognitive structures to new situations), and the last one enters the

equilibration stage (the process of continuous adjustment between assimilation and accommodation).

Although basically in Piaget's theory states that there are four stages of cognitive development of children (individuals), namely the first is the sensorimotor stage (0-24 months), where cognitive development through sensory coordination (hearing, seeing) with motor actions (touching, reaching); second preoperational stage (2-7 years) where the preoperational period of children (individuals) begin to think at the symbolic level (curiosity) although not yet using cognitive operations (not yet able to use reason to change, combine or separate ideas or thoughts). This period the child (individual) begins to build experiences about the environment through adaptation towards the concrete stage (when already able to think logically). The third stage enters the concrete operational period (7-11 years) expressed by the development of a system of thought based on direct experience even though it is not yet abstract or hypothetical. This stage children begin to have an understanding of the concept of conservation or commonly called the concept of conservacy, but it is still concrete. The last stage or the fourth stage is the formal operational stage (11 years and above). This period is the last stage of cognitive development qualitatively because it is able to reason by not dealing directly with objects (direct events). Learners (children /induvidu) have begun to propose hypotheses and have the ability to think analytically and logically and are able to coordinate well simultaneously (simultaneously) (Hanafi & Sumitro, 2019; Nainggolan & Daeli, 2021).

Constructivist learning is very important to be introduced as early as possible, because introduction through the constructivist learning process can be started or initiated by finding out about what the meaning of the material being presented is. For example, what is constructivism and how the steps of constructivist learning and open, honest, and so on (Yasin & Khasbulloh, 2022). Constructivist learning is the process of interpreting nature and visible phenomena, existing behavior, and characteristics that are packaged into a collection of theories and concepts through several scientific processes that have been carried out by humans (Firmansyah, Ubaidillah, & Busriyanti, 2023).The purpose of the learning process for each subject at school, to provide direct learning experience through implementation and development of process skills and scientific attitudes (Indawati, Kartiko, Suyitno, Sirojuddin, & Fuad, 2022). Learning in each subject in elementary school expects students to gain direct experience so that the learning process is more optimal and meaningful. honing students' thinking skills is also included in the objectives of the constructivist learning process (Ciptaningsih & Rofiq, 2022; Hasan & Aziz, 2023). In addition, it also aims for students to have a critical thinking attitude and ideas that can continue to improve and develop. Therefore, in creating a meaningful learning process atmosphere, a learning model is needed that is able to create optimal learning conditions, one of the learning models that is considered good is the implementation of a constructivist learning model.

CONCLUSION

The learning model implemented by educators has basically not been implemented optimally in any subject. Educators in the learning process still use many conventional learning models and methods in delivering teaching materials. Whereas the selection of the right learning model, especially the implementation of constructivist learning models, is the best method and strategy and is very optimal in improving learning outcomes. Because the constructivist learning model can prioritize contextual problems, build or construct students' thinking so that it can make students easier to accept and understand and develop the material provided, and the cognitive domain will be more honed so that learning outcomes increase.

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