



A Meta-Analysis of Constructivism Learning Implementation towards the Learning Outcomes on Civic Education Lesson

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The purpose of this study was to look at the effect of constructivism learning on civic education learning outcomes. Constructivism learning is a process of cognitive construction through learning by actively involving a series of student activities using diverse learning models. This research includes quantitative research with a meta-analysis approach that is calculating the correlation with the fixed effect model. First, formulating the research problem, then proceeding to explore relevant research, then research that does not publish the value of r is converted to the t and F values. The research sample of 25 student thesis, with thesis criteria studying the correlation of constructivism learning approaches to citizenship education learning outcomes. The result of the funnel plot fixed-effect model shows that twenty-five thesis has varied sample sizes with asymmetrical distribution, so the conclusions of the study regarding the relationship between constructivism learning and citizenship education learning outcomes are free from potential publication bias. This conclusion is strengthened by the appearance of forest plots before and after using the Trim and Fill method as well as the results of the summary effect display. Thus the level of validity of information based on a fixed-effect model of the relationship between constructivism learning and citizenship education learning outcomes is valid.

Keywords: constructivistic, learning outcomes, civic education, meta-analysis, learning implementation, constructivism

INTRODUCTION

Constructivism is a thought or view of the formation of knowledge with the active involvement of individuals. So that constructivism is understood as the process of acquiring knowledge through active adaptation to the environment by individuals

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(Piaget: 1936). Besides that, constructivism is part of the process of the results of social interaction as the construction of knowledge (Vigotsky: 1978). Thus, constructivism theory, in Von Glasersfeld's view, it is assumed that constructivism learning theory and teaching methods can guide human learning processes (Bettencourt: 1989). Furthermore, Bidell and Fischer (2005) explain that constructivism has the characteristics of acquiring knowledge as a product of the organization's activities in the environment. Based on these explanations, constructivism is the knowledge gained through the results of human construction, both individually and social interactions based on experience.

Tasked (1992) emphasized several constructivism learning theories, including the active role of students in constructing meaningful knowledge, making connections of ideas by constructing meaningfully, and linking ideas with new information received. The principle of constructivism learning emphasizes the active role of students through adaptive cognitive structures and helps to organize through students' real experiences because knowledge is not acquired passively (Wheatley: 1991). Explanation of the two theories confirms that learning needs to pay attention to students' initial knowledge as part of constructing new knowledge and designing meaningful learning for students by linking the topic of learning to daily life.

Slavin (1980) constructivism theory learning strategies are top-down processing, cooperative learning, and generative learning. Joyce (1992) explains that the learning model is to direct educators to design learning and help students in such a way that learning objectives are achieved. Furthermore, Arends (1997) explains the learning model leads to a specific learning approach, including its objectives, syntax, environment, and management system. So the constructivism theory forms several approaches or models of learning, namely philosophical forms of learning constructivism including discussion, testing of simple research results, demonstrations, demonstration of scientific procedures, and other scientific-practical activities to sharpen students' ideas.

Constructivism has emerged as an educational practice that has influenced in the last twenty-five years (Jones, M.G, 2002). Teachers have used constructivism-based pedagogy with enthusiasm and rarely happens now in a rapid increase with the learning center approach to school improvement (Jones, M.G, 2002; Powell, Farrar & Cohen, 1985). In recent years in Indonesia implementing a variety of learning models based on the paradigm of constructivism theory, Eko Supriadi research (2018) explains that constructivism theory has a relationship with increasing learning outcomes of citizenship education in Indonesia.

Meta-analysis is a quantitative study using statistical analysis methods, so that research information is obtained based on previous research process data (Sukamto: 1998). A meta-analysis study was conducted to review the research conducted by other researchers to obtain accurate information. Thus, research gathered from published journals, and those that are not publications with a focus on studies of learning models is based on constructivism theory. After being collected, the researcher obtained

information that the constructivist learning model had a relationship with the learning outcomes of citizenship education.

METHOD

Research Design

This research is quantitative. Quantitative research is the process of gathering and analyzing numerical information that distinguishes quantitative research methods from other types (Clifford: 2017). This study uses a meta-analysis approach to combine and evaluate statistically based on independent research findings, namely the relationship of constructivism learning with citizenship education learning. Meta-analysis provides a comprehensive evaluation with a statistical analysis of quantitative data obtained through independent studies on certain subjects (Glass, 1997; Lipsey and Wilson, 2001).

The effect size value is used to reach a standard value in evaluating the results of independent studies with meta-analysis (Sedat Turgut & Ilknur, G. T, 2018; Martens, 2010). Effect size value provides independent study results with being standardized and evaluated based on the same criterion (Sedat Turgut & Ilknur, G. T, 2018). The study obtained was coded based on certain criteria. Coding is the process of extracting data from individual studies to get the corresponding data analyzed (Cifci, S. K & Pinar, Y, 2019; Cogaltay & Karadag, 2015). Furthermore, in meta-analysis research using statistical analysis in research conducted and interpreting findings (Pigott, 2012; Sanchez-Meca & Marin-Martinez, 2010).

Data collection

Data collection for the analysis process based on research results is called secondary data, and secondary data is obtained through the process of observing thesis research components published or unpublished with thesis criteria examining the same object about the relationship of constructivism learning with the learning outcomes of citizenship education. Some research studies have taken the value of r as a measure of effect, while research that does not calculate the value of r converted to the value of F and t contained in the results of research studies.

Coding

The search results obtained 25 theses published or unpublished so that the research coding criteria consisted of the following components, namely: Sample information (year of study, subject, independent and bound variables), then quantitative images (sample sized, average achievement, values of F , t , and r). This stage is carried out before the statistical analysis process.

Data analysis

The effect size is the standard measure used by the meta-analysis, which determines the strength and direction of the relationship (Borenstein, Hedges, Higgins, & Rothstein, 2009). Standardized Average Effect Size is used to compare the average of independent groups, which are considered comparable for each study each of the two variables (Cifci, S. K & Pinar, Y, 2019; Hedges & Olkin, 1985). So that the data analysis

techniques in the study by using descriptive statistical analysis to calculate the effect size (magnitude of influence) and summary effect (number of effects) with a fixed-effect model. Furthermore, a biased publication analysis is performed, using the JASP 0.8.4.0 program.

FINDINGS

The secondary data collection process is the result of the student research thesis published or not. The subjects of each thesis are very diverse with some different subjects. Here are some research results that have the characteristics determined by researchers as samples as listed in the following table 1:

Table 1
Search for Research Results

Researcher's Name / Year	N	R	Independent Variable	Dependent Variable
Anjani, R; 2013	80	0.206	Learning of Auditory	PPKn Learning Achievement
Harta, M; 2017	80	0.376	Two Stay Learning Two Tray	PPKn Learning Outcomes
Dewi, M.P; 2013	91	0.509	Take and Give Learning	PPKn Learning Outcomes
Suryani, R; 2013	70	0.333	CTL model	PPKn Learning Achievement
Dunia, N; 2010	30	0.671	Conflict Resolution Model	PPKn Learning Achievement
Ayu, I; 2014	27	0.454	Scientific Model	PPKn Learning Outcomes
Basri, M; 2016	29	0.558	Problem Based Instruction	PPKn Learning Outcomes
Susilawati; 2016	45	0.641	Learning Contestant	Results Learn PPKn
Sumarniwati ; 2016)	68	0.382	Aptitude-Treatment Interaction Learning	Results Learn PPKn
Sumarna, A.N; 2014	34	0.692	Learning Portfolio	Results Learn PPKn
Purwanto, I.P.T; 2014	32	0.326	Learning Generative	Results Learn PPKn
Hidayah, N.S; 2014	36	0.325	Method <i>Brainstorming</i>	Think Critical PPKn
Melani, Z; 2009	35	0.343	Internet media	Achievement LearnPPKn
Winarsi, O; 2014	64	0.23	Use of LKS	Achievement LearnPPKn
Hermawan, H; 2013	25	0.475	<i>Discovery Learning</i> Method	Achievement LearnPPKn
Andriyani, F; 2014	36	0.584	Use of magazine media	Achievement LearnPPKn
Widaningrum, D; 2014	61	0.397	Learning <i>Active Learning</i>	Achievement LearnPPKn
Lestari, P; 2014	36	0.446	Problem Based Learning	Results Learn PPKn
Atmoko, A.D; 2015	34	0.311	<i>Cooperative Learning</i>	Results Learn PPKn
Salibno, T.B.I; 2015	32	0.519	Learning TreePancasila	Achievement LearnPPKn
Aji, S.S; 2015	32	0.446	Source Mass media learning	AchievementStudying PP Kn
Faradiba, D.G; 2015	32	0.354	Cooperative <i>Talking Chips</i> Technique	Results Learn PPKn
Pujian, S.N; 2015	64	0.234	Value Clarification Technique	Results Learn PPKn
Firda, N; 2015	32	0.372	<i>Student Teams-Achievement Divisions (STAD)</i>	Achievement LearnPPKn
Parhanatul, P; 2015	30	0.36	Learning <i>The Learning Cell</i>	Results Learn PPKn

Based on the table above, two theses were identified that calculate the r-value of the twenty-five theses collected, some of which were converted to F and t to get the r-value. Then we calculate the effect size and summary effect based on the data in table Two below:

Table 2
Tabulation of Fixed Effect Model Data

Researcher's Name / Year	N	R	Y(z)	Vy	W	WY	WY ²	W ²
Anjani, R; 2013	80	0.206	0.209	0.013	77	16.093	3.3634	5929
Harta, M; 2017	80	0.376	0.396	0.013	77	30.492	12.075	5929
Dewi, M.P; 2013	91	0.509	0.562	0.011	88	49.456	27.794	7744
Suryani, R; 2013	70	0.333	0.346	0.015	67	23.182	8.021	4489
Dunia, N; 2010	30	0.671	0.813	0.037	27	21.951	17.846	729
Ayu, I; 2014	27	0.454	0.489	0.042	24	11.736	5.7389	576
Basri, M; 2016	29	0.558	0.63	0.038	26	16.38	10.319	676
Susilawati; 2016	45	0.641	0.76	0.024	42	31.92	24.259	1764
Sumarniwati ; 2016)	68	0.382	0.402	0.015	65	26.13	10.504	4225
Sumarna, A.N; 2014	34	0.692	0.852	0.032	31	26.412	22.503	961
Purwanto, I.P.T; 2014	32	0.326	0.338	0.034	29	9.802	3.3131	841
Hidayah, N.S; 2014	36	0.325	0.337	0.03	33	11.121	3.7478	1089
Melani, Z; 2009	35	0.343	0.357	0.031	32	11.424	4.0784	1024
Winarsi, O; 2014	64	0.23	0.234	0.016	61	14.274	3.3401	3721
Hermawan, H; 2013	25	0.475	0.517	0.045	22	11.374	5.8804	484
Andriyani, F; 2014	36	0.584	0.668	0.03	33	22.044	14.725	1089
Widianingrum, D; 2014	61	0.397	0.421	0.017	58	24.418	10.28	3364
Lestari, P; 2014	36	0.446	0.48	0.03	33	15.84	7.6032	1089
Atmoko, A.D; 2015	34	0.311	0.322	0.032	31	9.982	3.2142	961
Salibno, T.B.I; 2015	32	0.519	0.576	0.034	29	16.704	9.6215	841
Aji, S.S; 2015	32	0.446	0.48	0.034	29	13.92	6.6816	841
Faradiba, D.G; 2015	32	0.354	0.37	0.034	29	10.73	3.9701	841
Pujian, S.N; 2015	64	0.234	0.238	0.016	61	14.518	3.4553	3721
Firda, N; 2015	32	0.372	0.391	0.034	29	11.339	4.4335	841
Parhanatul, P; 2015	30	0.36	0.377	0.037	27	10.179	3.8375	729
					1060	461.42	230.607	54498

Based on the calculation of the effect size obtained, an average weighted effect of 0.44 with a variance of 0.000943 while a standard error of 0.031. For the average confidence interval (M), the weighted effect has a significant level of 95% located in the range of 0.37 to 0.50. Thus the results of the summary effect can be seen in the following forest plot figure;

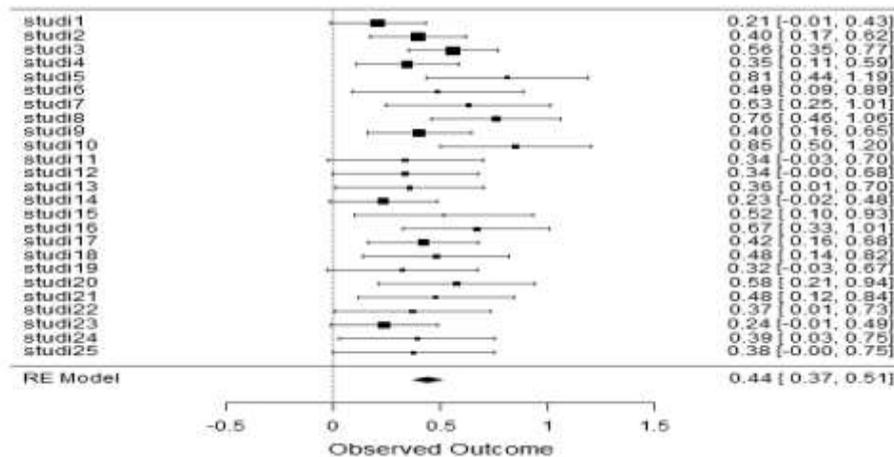


Figure 1
The Results of the Forest Plot Summary Effect

Furthermore, do the calculation of p-value and z value to determine the acceptance and rejection of the null hypothesis. Based on the calculation, the z value of 14,172 while the p-value using Microsoft Excel with formula = 1-NORMSDIST (14.17) obtained the value of p decreased from α ($p < 0.05$), meaning that the hypothesis was accepted at a significant level of 95%, both one-tailed test and two-tailed test. Thus, the constructivism learning model can correlate significantly with citizenship education learning outcomes.

Furthermore, to find out whether the relationship is strong between the constructivism learning model and citizenship education learning outcomes is to convert the weighted average effect size (M) to the correlation coefficient (r). Based on the calculation, the r-value of 0.410 is obtained with a confidence interval of 0.36 - 0.46, including the strong category.

The process of detecting publication bias in 25 studies is an attempt to obtain missing (unpublished) research information and an evaluation of research conclusions which conclude that constructivism learning has an influence on improving citizenship education learning outcomes. Detect publication research bias by using the JASP software with the following results:

Table 3
Rank Asymmetry Test Correlation for Funnel Plot

Rank correlation test for Funnel plot asymmetry		
	Kendall's T	P
Rank test	0.2849	0.051
Regression test for Funnel plot asymmetry ('Egger's test')		
	Z	P
Sei	1.9320	0.053

The results of the rank correlation test for funnel plot asymmetry are used to see the research that includes publication bias and not publication bias based on Kendall's values and the magnitude of the regression correlation coefficient with variance. Decision making with criteria, if the $p\text{-value} < \alpha (0.05)$ research includes publication bias, while the $p\text{-value} \geq \alpha (0.05)$ does not include publication bias. After the analysis process is obtained, the value of the rank correlation method is 0.2849 with $p\text{-value} (0.051) \geq \alpha (0.05)$, while the regression method is 1,932 with $p\text{-value} (0.053) > \alpha (0.05)$, meaning that no publication evidence is found. Furthermore, missing research information can be seen in the following Trim-fill Analysis diagram output;

Trim-fill Analysis

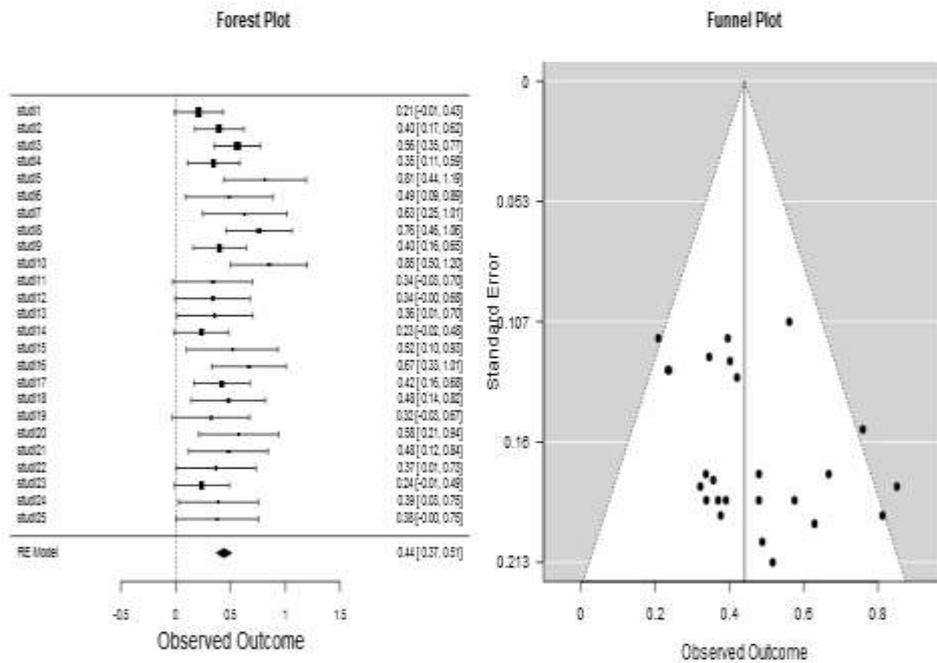


Figure 2 Forest Plot and Funnel Plot of the Summary Effect Related to Publication Bias

Based on the forest plot and funnel plot picture above, there is no visible circle in the funnel plot picture from the fixed-effect model, so no missing research is found, meaning that constructivism learning has a relationship or influence on citizenship education learning outcomes protected from potential publication bias. This explanation is reinforced by the results of the forest plot display, that the results of the Summary effect of the fixed-effect model do not shift or are less than the summary effect before and after using the Trim and Fill method, meaning that conclusions based on a fixed-effect model about the relationship of constructivism learning with citizenship education learning outcomes are valid.

DISCUSSION

Based on the explanation of the results of the study above, the constructivism learning process has a strong correlation with citizenship education learning outcomes, the relationship can be seen from the summary effect with a fixed-effect model of 0.44 greater than the effect magnitude of 0.20 and z value of 12.678 while r has a value of 0.43. Thus, the relationship occurs because of the characteristics of student-centered constructivism learning, as stated by Tasked (1992) that constructivism learning prioritizes the active role of students in constructing meaningful knowledge, making connections of ideas by constructing meaningfully, and linking ideas with new information received. Wheatley's (1991) statement that knowledge is not acquired passively, but actively through students' cognitive structures and cognitive functions is adaptive and helps to organize through students' real experiences. Thus, Pritchard (2010) explains that constructivism learning with critical thinking, motivating, learning independence, feedback, dialogue, language, explanation, questioning, learning through teaching, contextualization, experimentation, or problem-solving in the real world.

A meta-analysis of the results of the thesis research of twenty-five students with thesis criteria using a constructivism learning model, the constructivism theory paradigm that is students who are more active. The theory of constructivism can improve student's learning outcomes, where the results of Eko Supriadi research (2018) found evidence that constructivism learning is very effective in the use of citizenship education learning.

While the funnel plot diagram results explain the twenty-five thesis that examines the relationship between constructivism learning and citizenship education learning outcomes does not occur publication bias, the explanation can be seen there is no open circle in the funnel plot picture from the fixed-effect model, the absence of publication bias is strengthened from the results forest plot, where before and after using the Trim and Fill method shows a summary effect of the fixed effect model of the same result. Thus, the constructivism learning relationship with the learning outcomes of citizenship education is valid.

Funnel plot test results have limitations to know publication bias against research results. Therefore Begg and Mazumdar (1994) are advised to use rank correlation while Rothstein (2006) complements the limitations of correlation rank with regression. So that in the research obtained a p-value of the correlation rank and regression is greater than α (0.05), it means that what is shown by the funnel plot is symmetrical and have not proved publication bias in the conclusions of research regarding the relationship of constructivism learning with educational learning outcomes citizenship.

CONCLUSION

Based on the results of the study above, that the constructivism learning model has a significant correlation to citizenship education learning outcomes, where the p-value < 0.05 at 95% confidence level so that the relationship between the two variables can be concluded very strongly with a confidence interval of 0.3584-0.4586 and r at 0.4097. To obtain twenty-five thesis information obtained that examines the relationship

between constructivism learning and proven citizenship education learning outcomes and can be trusted.

The process of delivering and instilling knowledge requires an approach in teaching, creating effective learning; in general, the approach can be teacher-centered and student-centered. Student-centered learning approaches tend to make students not passive in developing their knowledge so that citizenship education learning that prioritizes sociocultural issues in shaping individual understanding is very effective to consider.

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