International Summit on Science Technology and Humanity
ISETH 2023
ISSN: 2807-7245 (online)

Effectiveness of Card Sort Learning Method to Improve Students' Cognitive in Kemuhammadiyahan Learning

Fauziyah Qurrota A'yun Tamami[1], Muhammad Wildan Shohib, Siti Rahmawati
Faculty of Islamic Religion, Universitas Muhammadiyah Surakarta, Surakarta, Indonesia

Abstract

Purpose: The study aims to investigate the effectiveness of the card sort learning method in improving students' cognitive students in Kemuhammadiyahan learning at Muhammadiyah 2 Surakarta High School, Indonesia.
Methodology: This research is quantitative by the environment, and the data was gathered through the use of questionnaires, observation, and documentation. Descriptive analysis and basic linear regression tests were employed to analyze the data.
Results: The outcome of this investigation proves that the level of student perspective towards the card sort learning method and the learning achievement of students in the Muhammadiyah subject are in a positive category. The findings of the average mean score demonstrate the Muhammadiyah subject perceived level at 45.41% and the card sort method perceived level at 43.2%. The partial t-test ($t = 8.276$, $p = 0.000$) shows that the total cart sort learning method is linked to the overall learning outcomes of Muhammadiyah studies. The results of the significant prediction equation are built as Total Kemuhammadiyahan Learning = 0.933 + 0.129 (Total Card Sort Method). It can be possible to deduce that Ho is rejected and Ha is somewhat accepted, and therefore the card sort method significantly improves and predicts students' cognitive achievement in Muhammadiyah studies.
Applications/Originality/Value: According to the study's result, a card-sort learning method can be used effectively to improve students' cognitive aspects while learning Muhammadiyah studies. This study makes a significant contribution to the understanding of the card sort learning method as an effective instrument to develop the student's cognitive abilities in learning Muhammadiyah studies.

Introduction

Learning is the process of acquiring information, skills, attitudes, or ethics via study, experience, or instruction (Henikusniati, Andayani, & Savalas, 2015). In the context of research, learning can refer to gaining new information or abilities via the study of scientific literature (Rithaudin and Prasetyowati, 2019; Subekti & Ariswan, 2016). Therefore, one of the determinants of learning activities is to use of learning methods.

A learning method is a method used or presented in the teaching and learning process of teachers with students during learning to student achieve learning objectives (M.S., 2016; M., 2009; Nana, 2005). There are various methods that instructors might apply to the learning process with students, one of which is the card sort method. Muhammadiyah 2 Surakarta High School applies this method to Kemuhammadiyahan Learning in Class XI. The card sort method is a study method used to better comprehend a person's cognitive content in the form of groups or individuals. This technique involves students sorting a set of index cards that represent content into categories and describing content they understand.

The application of the card sort method in social studies learning by grade VIII B students of SMP Negeri 3 Kampak proved to be very effective and able to improve student learning outcomes; this study was examined (Arini, 2020). Fraydika (2021) found that the card sort method used by MAN 3 West Pasaman jurisprudence teachers has been carried out well, but some students are not optimal in applying the steps in the method, but this method is very helpful in learning jurisprudence.

According to Tamsil (2020), teachers who use the card sort method in learning Arabic subjects want their students not to feel bored, and then students can be active and can train students' cognitive skills so that this method is student-centered while the teacher is only a facilitator in this learning process. The card sort method is one that students prefer because it helps them understand concepts better and makes them more enthusiastic about learning, which reduces boredom and increases motivation to engage in this learning (Herwin, Husin, & Rahmawati, 2021). Sholichah (2020) states that the card sort method is not only suitable to be applied to other materials but also suitable to be applied to QS subjects. Yunus 40–41, because with this method, students not only get knowledge from the material through the teacher but also from friends who have been inducted into their understanding.

[1] Corresponding author : g000204332@student.ums.ac.id

Previous research highlighted the implementation and influence of card sort method learning on students' understanding of learning in a complex manner. So far, no previous research has found the Effectiveness of the Card Sort Learning Method in Improving Students Cognitive in Kemuhammadiyahan Learning at Muhammadiyah 2 Surakarta High School. Considering that the research has not been found, it is essential to do a study in this area. The goal of this research was to investigate the efficacy of the card sort technique with Kemuhammadiyahan learning at Muhammadiyah 2 Surakarta High School.

Research Methods

This study is quantitative in nature (Aini, 2022; Asyari, 2017; Vebrianto et al., 2020) and the data was obtained directly from the respondents by distributing questionnaires. The quantitative approach is used because the information gained is numerical (Creswell, 2012; Hermawan S.Ag, M. Pd. I, 2019; Slamet Riyanto, S.T., M.M, Dr Aglis Andhita Hatmawan, S.E, 2020). This study intends to identify the effectiveness of the card sort method in improving the students' cognitive in Kemuhammadiyahan learning at Muhammadiyah 2 Surakarta High School (Albar, 2023). This study's population included all students in grades XI-1, XI-2, and XI-3, for a total of 60 individuals. In this study, saturation samples are used, which means that the whole population is used as a sample.

This study's data analysis method is descriptive-quantitative, with the data obtained from the responses of students through questionnaires that have been distributed during the study. The normality and linearity tests are used to perform the precondition analysis test. Furthermore, IBM SPSS Statistics 24 was used to do a basic linear regression test, and the hypothesis test was run using the t-test and the coefficient of determination.

Quantitative Analysis

a. Validity Test

A card-sort method questionnaire was used to help students in Kemuhammadiyahan studies learn more effectively. It had 30 questions, with 10 questions in each variable, and was sent to 60 respondents. The results that follow are the outcomes of the IBM SPSS Statistics 24 data analysis version:

Table 1. Correlations

Correlations

		Total MCS	Total MK Kemuhammadiyahan
Total MCS	Pearson Correlation	1	,736**
	Sig. (2-tailed)		,000
	N	60	60
Total MK Kemuhammadiyahan	Pearson Correlation	,736**	1
	Sig. (2-tailed)	,000	
	N	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

The significant value of the card sort technique variable (X) may be observed in the validity test results table above and the Kemuhammadiyahan learning variable (Y) is 0.00. It is valid if the value of sig. is < 0.05. So that all questions in the research instrument on the two variables are valid, the significant value is 0.00, which is < 0.05.

b. Reliability Test

Table 2. Reliability Statistics of Card Sort Method

Reliability Statistics

Cronbach's Alpha	N of Items
,784	15

Cronbach's alpha may be seen in the table of reliability test results above 0.784 from a total of 15 question items regarding the card sort method. If Cronbach's alpha value is more than 0.6, the research instrument is regarded as dependable. As a result of the value of Cronbach's alpha, the instrument in this investigation is dependable at 0.784 > 0.6.

Table 3. Reliability Statistics of Kemuhammadiyahan Learning

Reliability Statistics

Cronbach's Alpha	N of Items
,885	15

Cronbach's alpha may be observed in the above table of reliability test results value is 0.885 from a total of 15 question items regarding Kemuhammadiyahan studies. The study instrument is considered reliable if the value of Cronbach's alpha is > 0.6. So, the research instrument is regarded as dependable. Because of Cronbach alpha, the instrument in this investigation is dependable is 0.885 > 0.6.

c. Prerequisite Test

1. Normality Test

Table 4. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		60
Normal Parameters [a,b]	Mean	,0000000
	Std. Deviation	,24276486
Most Extreme Differences	Absolute	,104
	Positive	,080
	Negative	-,104
Test Statistic		,104
Asymp. Sig. (2-tailed)		,172[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Based on the table of normality test results using the one-sample K-S formula above, with a degree of importance level of 0.172 was obtained. The data is normally distributed in the importance level is > 0.05. As a result, the results in this study may be regarded as being regularly dispersed because 0.172 > 0.05.

2. Linearity Test

Table 5. Linearity Test Results

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Total MK Kemuhammadiyahan * Total MCS	Between Groups	(Combined)	5,453	18	,303	5,829	,000
		Linearity	4,106	1	4,106	79,014	,000
		Deviation from Linearity	1,347	17	,079	1,524	,134
	Within Groups		2,131	41	,052		
	Total		7,583	59			

The value of the sig. Deviation from linearity is based on the table of linearity test results above, the value of the sig. Deviation from linearity is 0.134. Data is represented if the value of sig is positive the results are linear. Deviation from linearity > 0.05. So, it can be stated that the effectiveness of the card sort method to improve student cognition in Kemuhammadiyahan learning has a linear relationship because 0.134 > 0.05.

d. Descriptive Analysis

1. Frequency Distribution of Muhammadiyah Studies (X)

Table 6. Frequency Distribution of Muhammadiyah (X)

No Item	Analysis STS	TS	S	SS	N	SCORE	Standard Deviation	(MEAN)	CATEGORY
1	1	3	49	7	60	182	0,486	3,03	High
2	0	3	47	10	60	187	0,454	3,12	High
3	0	5	50	5	60	180	0,412	3,00	High
4	0	4	38	18	60	194	0,563	3,23	High
5	0	11	41	8	60	177	0,565	2,95	Moderate
6	0	5	42	13	60	188	0,536	3,13	High
7	0	2	41	17	60	195	0,508	3,25	High
8	0	4	48	8	60	184	0,446	3,07	High
9	2	7	44	7	60	176	0,607	2,93	Moderate
10	1	17	33	9	60	170	0,693	2,83	Moderate
11	0	8	37	15	60	187	0,613	3,12	High
12	0	10	40	10	60	180	0,582	3,00	High
13	0	7	45	8	60	181	0,504	3,02	High
14	2	11	35	12	60	159	0,729	2,95	Moderate
15	3	13	38	6	60	147	0,691	2,78	Moderate
Akumulasi Rata-Rata Skor					90	3246	8,389	45.41	High

Based on the frequency distribution table of the Kemuhammadiyahan learning above, it shows that the average score of respondents on the Kemuhammadiyahan learning survey with a total of 15 question items was high at 45.41. Thus, the cognitive level of students in Kemuhammadiyahan learning is in the high category.

Table 7. Thresholds Indicating Descriptive Analysis

Thresholds that Indicate the Level of Descriptive Analysis	
Thresholds	Level of Descriptive Analysis
1-2	Low
2-3	Moderate
3-4	High

2. Variable Frequency Distribution Card Sort Method (Y)

Table 8. Variable Frequency Distribution Card Sort Method (Y)

No Item	Analysis				N	Score	Standard Deviation	(MEAN)	CATEGORY
	STS	TS	S	SS					
16	2	15	36	7	60	168	0,684	2,80	Moderate
17	1	3	33	23	60	198	0,646	3,30	High
18	0	13	41	6	60	181	0,555	2,88	Moderate
19	1	9	42	8	60	177	0,594	2,95	Moderate
20	0	6	50	4	60	178	0,410	2,97	Moderate
21	0	10	43	7	60	177	0,534	2,95	Moderate
22	1	10	41	8	60	176	0,607	2,93	Moderate
23	0	13	42	5	60	172	0,536	2,87	Moderate
24	1	9	42	8	60	177	0,594	2,95	Moderate
25	0	8	42	10	60	172	0,551	2,03	Moderate
26	1	13	42	4	60	169	0,567	2,82	Moderate
27	1	13	40	6	60	171	0,606	2,85	Moderate
28	0	11	39	10	60	180	0,596	2,98	Moderate
29	1	8	41	10	60	182	0,611	3,00	High
30	1	6	45	8	60	180	0,552	3,00	High
Akumulasi Rata-Rata Skor					900	2658	8,643	43,2	High

Based on the frequency distribution table above, respondents in the Card Sort Method received responses of 43.2. So, it can be concluded that the perception or cognitive level of students in the Card Sort Method at Muhammadiyah 2 Surakarta High School is in the high category.

Table 9. Thresholds Indicating Descriptive Analysis

Thresholds that Indicate the Level of Descriptive Analysis	
Thresholds	Level of Descriptive Analysis
1-2	Low
2-3	Moderate
3-4	High

e. Simple Linear Regression Analysis

Table 10. Results of Simple Linear Regression Analysis

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	,129	,343		,375	,709
	Total MCS	,933	,113	,736	8,276	,000
a. Dependent Variable: Total MK Kemuhammadiyahan						

According to the basic linear regression analysis findings table above, the constant value (a) is 0.129, while the Card Sort Method (regression coefficient) is 0.933. The regression equation is given below based on the results:

$$Y = 0{,}129 + 0{,}933\ x$$

The calculation above produces a constant of 0.129, indicating that the Card Sort Method variable has a consistency value of 0.129. 0.933 is the (X) regression coefficient which states that by adding 1% of the Card Sort Method value, the cognitive abilities of students in the Kemuhammadiyahan learning will rise by 1,062%. Because the regression coefficient is positive, the direction of the Kemuhammadiyahan learning variable (X) to the Card Sort Method variable (Y) is also positive. And, based on the table's significance value of 0.00 0.05, it may be deduced that the variable can be Kemuhammadiyahan learning (variable X) affects the Card Sort Method (variable Y).

f. Hypothesis Test

1. Test of Results T (Partial)

Table 11. Test of Results T (Partial)

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,129	,343		,375	,709
	Total MCS	,933	,113	,736	8,276	,000

a. Dependent Variable: Total MK Kemuhammadiyahan

There is a very strong link between the Total Card Sort Method and the Total Subjects result of Kemuhammadiyahan ($t = 8.276$, $p = 0.000$) according to the preceding table. Based on the findings, the prediction equation to predict the results of "Total Learning of Kemuhammadiyahan" using the "Total Card Sort Method" as a predictor can be constructed as follows.

Total Kemuhammadiyahan Learning = 0.933 + 0.129 (Total Card Sort Method).

It can be concluded that the Total Card Sort Method significantly predicts or influences the total learning of Kemuhammadiyahan.

2. Coefficient of Determination

Table 12. Results of Coefficient of Determination

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,736[a]	,541	,534	,24485

a. Predictors: (Constant), Total MCS

b. Dependent Variable: Total MK Kemuhammadiyahan

A relationship value (R) of 0.735 was computed based on the test findings shown in the table above. The coefficient of determination was 0.541 based on the test results. This demonstrates that the Kemuhammadiyahan learning variable (X) has a 5.41% influence on the Card Sort Method (Y) variable.

Conclusions

This study was conducted to test the effectiveness of the card sort method on the cognitive abilities of students in Kemuhammadiyahan learning. Based on the findings of this study, it is possible to assume that, first, students' cognitive level toward Kemuhammadiyahan learning in the class XI card sort method at Muhammadiyah High School 2, Surakarta, is in the "high" category.

This is based on the average mean variable of Kemuhammadiyahan learning (45.41%) and the variable card sort method (43.2%). This means that the better the card sort method, the smarter the students were when it came to Kemuhammadiyahan learning. It is possible to establish that who was rejected and Ha was only partially accepted, so the card sort method was effective and significant in improving students' cognitive skills in Kemuhammadiyahan learning at Muhammadiyah 2 Surakarta High School.

Acknowledgments

Thank you to all parties who have helped and supported me a lot from the onset of the study procedure to the conclusion of this research, and hopefully, it can contribute to the body of knowledge

References

Aini, Nurul. 2022. "Analisis Bibliometrik Corporate Social Responbility Terhadap Kinerja Keuangan (Pada Perusahaan Manufaktur Di BEI Tahun 2019-2022)." : 83–87.

Albar, M K. 2023. "WHAT IS THE STUDY POLICY IN BANYUMAS? IMPLEMENTATION OF ACTIVE LEARNING STRATEGIES IN JUNIOR HIGH SCHOOL." *Journal of Law and Sustainable Development* 11(3). https://www.scopus.com/inward/record.uri?eid=2-s2.0-85169574213&doi=10.55908%2Fsdgs.v11i3.347&partnerID=40&md5=642d8121da0cc2df855f361e47610807.

Arini, Trisia. 2020. "Peningkatan Hasil Belajar Ips Melalui Metode Card Sort Siswa Kelas Viib Di Smp Negeri 3 Kampak." *Dinamika Penelitian: Media Komunikasi Penelitian Sosial Keagamaan* 20(2): 367–89.

Asyari, S. 2017. "Incorporating Islamism into Secular Education System: An Attempt of Gradual Islamization of the State and Society by an Indonesian Tarbiyah Movement in Jambi." *Journal of Indonesian Islam* 11(1): 29–58. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85042103409&doi=10.15642%2FJIIS.2017.11.1.29-58&partnerID=40&md5=d937ba6842f8a4dd154148a091cf8269.

Creswell, John W. 2012. Pustaka Pelajar *Research Design: Pendekatan Kuantitatif, Kualitatif,Dan Mixed (Edisi Ketiga)*.

Fitz Patrick, Molly. 2022. "Card Sorting: How to Get Started." *Interaction Design Foundation*.

Fraydika, Odik. 2021. "Implementasi Metode Card Sort Pada Pembelajaran Fiqih Di Man 3 Pasaman Barat." *Paramurobi:*

Jurnal Pendidikan Agama Islam 4(2): 1–9.
Henikusniati, H, Y Andayani, and L Savalas. 2015. "Penerapan Pembelajaran Dengan Pendekatan Keterampilan Proses Sains Untuk Meningkatkan Hasil Belajar Kimia Siswa SMK Negeri 3 Mataram." *Jurnal Penelitian Pendidikan IPA* 1 (2). https://doi.org/10.29303/jppipa.v1i2.19.
Hermawan S.Ag, M. Pd. I, M. Iwan. 2019. *Metologi Penelitian Pendidikan Kualitatif, Kuantitatif, Dan Mixed Method*.
Herwin, Herwin, Muhammad Said Husin, and Indriana Rahmawati. 2021. "Penerapan Metode Card Sort Untuk Meningkatkan Motivasi Belajar Fiqh Siswa Mts Nabil Husein Samarinda." *Sultan Idris Journal of Psychology and Education* 1(1): 1–16.
Kartini, N. Euis, Encep Syarief Nurdin, Kama Abdul Hakam, and Syihabuddin Syihabuddin. 2022. "Telaah Revisi Teori Domain Kognitif Taksonomi Bloom Dan Keterkaitannya Dalam Kurikulum Pendidikan Agama Islam." *Jurnal Basicedu* 6(4): 7292–7302.
M.S., Arif. 2016. "Pengertian Strategi, Metode, Taktik." *Elearning Unesa*. http://blog.elearning.unesa.ac.id/m-saikhul-arif?p=3/.
M, Sutikno. 2009. *Belajar Dan Pembelajaran, Prospect*. Bandung.
Nana, Sudjana. 2005. *Penelitian Hasil Proses Belajar Mengajar*. Bandung. PT. Remaja Rosdakarya.
Rithaudin, Ahmad, and Indah Prasetyowati. 2019. "Analisis Pembelajaran Aspek Kognitif Materi Pendidikan Jasmani Olahraga Dan Kesehatan SMA/SMK Di Daerah Istimewa Yogyakarta." *Jurnal Pendidikan Jasmani Indonesia* 15 (1): 33–38. http://dx.doi.org/10.21831/jpji.v15i1.25490.
Sholichah, Mar'atus. 2020. "Penerapan Metode Card Sort Dalam Menyampaikan Materi Pelajaran PAI Q.S. Yunus: 40-41di Kelas XI SMAN 1 Geger Madiun." *Ngabari: Jurnal Studi Islam dan Sosial* 13(2): 34.
Situmorang, Evando, and Desinta Purba. 2019. "Perancangan Aplikasi Pengujian Validitas Dan Reliabilitas Instrumen Penelitian. Kakifikom, Kumpulan Artikel Karya Ilmiah Fakultas Ilmu Komputer, 1(2)." 02: 54–58.
Slamet Riyanto, S.T., M.M , Dr Aglis Andhita Hatmawan, S.E, M.M. 2020. *Metode Riset Penelitian Kuantitatif*.
Subekti, Y, and A Ariswan. 2016. "Pembelajaran Fisika Dengan Metode Eksperimen Untuk Meningkatkan Hasil Belajar Kognitif Dan Keterampilan Proses Sains." *Jurnal Inovasi Pendidikan IPA* 2 (2): 252–61.
Tamsil, Irvan Maulana. 2020. "Analisis Metode Card Sort Dalam Pembelajaran Mufradat Berbasis Pendekatan Kognitif." *Lughawiyah: Journal of Arabic Education and Linguistics* 2(1): 46–55.
Vebrianto, Rian et al. 2020. "Mixed Methods Research: Trends and Issues in Research Methodology." *Bedelau: Journal of Education and Learning* 1(2): 63–73.