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The Impact of Flashcard Media on Student Cognitive Improvement in IPAS Subjects at Elementary School

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ABSTRACT

In learning activities, problems are still found such as difficulties when explaining the material because there is no concrete learning media so that students' cognitive improvement is not optimal, cognitive abilities in elementary schools still need to be improved. This study aims to develop interactive learning media in the form of Flashcards to enhance the cognitive abilities of first-grade elementary school students, with experimental and control types of research on quantitative approaches. The data collection method uses Pretest and Posttest questions, with the research population of all 1A class students totaling 25 students and 1C totaling 20 students. The data collected was obtained as the data was normal, by independent samples t-test. The study concludes that flashcard learning media is used for cognitive enhancement of class I, the significance value of 0.000, which is less than 0.05, indicates that there is a statistically significant difference. before and after the action. Therefore, it is stated that the original the null hypothesis is rejected in favor of the alternative hypothesis. Therefore, it can be concluded that flashcards can be effectively used to aid the learning process of students and improve their cognitive skills.

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1. INTRODUCTION

Learning is a very important effort to have awareness to realize a more planned learning process for students, so that they are able to be more active to develop their personality and potential with the value of behavior patterns for their lives (Arisoy & Aybek, 2021). Education is directed to improve the quality of human life with cognitive abilities to develop themselves to participate in social life (Iskandar Batubara et al., Heri Kusmanto, Arif Nasution, Amir Purba, 2021). In the era of globalization, the importance of early childhood education, because at an early age children's development is much better so that education needs to produce and create students who have the potential for successful learning (Aghni, 2018). Education in Indonesia has entered the age of Industry 4.0 foundation in the survival of students, because this educational world relationship follows the development of technology as a sophisticated facility to facilitate the learning process (Mukarromah & Andriana, 2022).

This learning allows them to interact with others and increase their knowledge of information that will be available in the future. Good communication helps to achieve independent learning (Anisa & Attamimi, 2023). (Yulianti et al., Siregar, Hidayat, 2022) states that there are educational goals that must still be related to the three skill areas of students with their thought processes (cognition), values and attitudes (affective), and skills (psychomotor). Educators not only transfer knowledge but as a guide towards a better direction by utilizing cognitive learning so that students are able to realize learning more independently and there is good communication to encourage information knowledge and interaction (Budiyono, 2020). With cognitive thinking, students are able to develop critical learning independently so that they can solve problems, to improve student cognition depends on the classroom atmosphere and the way the teacher presents the material so that whether there is student interest in learning (Like Triyanti et al., Hastuti Noer, Sugeng Sutiarso, 2021). Students are able to develop their cognitive abilities well when they have an understanding of concepts with their potential, cognitive enhancement needs to be considered because it is the essence of learning organized by students to measure understanding considerations (Krisdiana & Jamaludin, 2023). Students need to be encouraged to think critically so that cognitive improvement occurs so that they can solve ideas or ideas that are fairly difficult, this allows teachers to gauge students understanding by focusing on the context explained and measures their knowledge of learning outcomes. (Inggrida et al., Elizabeth Christiana, 2019).

In addition, it is necessary to be assisted by media in order to implement the plans that have been made to be more optimal. Educational media is considered effective when it can facilitate learning, the learning experience will also feel interesting if the object is tangible (Nazilatul Mifroh, 2022). The media used is Flashcard which is a concrete media in the form of cards containing images related to interconnected material so that it can attract students' attention. In this Flashcard can trigger the brain to be more effective so that it helps learn to read, write, and recognize related to the five senses (Israwati et al., Lukman, Endi Nasrawati Hamid, 2022). Flashcard are made to develop memory, train independence, and expand vocabulary (Siti Aminah, 2019). Through Flashcard media can develop students' cognitive abilities by introducing the concept of types and functions of the five senses so that students will be more excited about learning. Factors that influence student cognitive improvement are learning provided by teachers, social environment, student background, and supporting facilities (Purnamasari & Nurhayati, 2019).

Cognitive comes from the word cognition which means “knowing” something that involves factual knowledge in the form of learning ability and thinking ability, this aspect is an effort to understand what happens to the environment and use memory to solve problems (Ramadhan Almadani &, Dede Indra Setiabudi, 2022). In addition, this cognitive aspect has the characteristics that there is a problem presented in learning and the learning carried out encourages students to actively participate to interact with teachers, friends, and the environment (Mutia, 2021). Using additional learning media will support cognitive enhancement to be varied in increasing motivation, enthusiasm, and foster curiosity in learning to enhance understanding of the provided information and learning objectives will be maximally achieved (Shafa et al., 2022). Flashcard are a medium that functions to help learning, shaped like a large size card to make it easier for students to recognize vocabulary, this media is suitable for reminding reading skills and recognizing images (Insyirah Shafa, Zulham Siregar, 2021). Flashcard are easy to find and create by editing them in Canva and printing them on large paper so students can easily review what is

included on the cards. (Saputri, 2020). Flashcard are learning media that have benefits that not only help students' intelligence but intellectuals such as remembering sentences, increasing vocabulary, solving problems, critical thinking, and can build more active and interactive learning activities.

In conducting research, the author has things that will be differentiated from previous research. The subject used is ipas, the independent variable used is cognitive enhancement assisted by interactive media, namely Flashcard, the dependent variable used is cognitive enhancement, the sample used by the author is grade 1 student. In addition, the implementation of this study will be supported by relevant research from previous researchers who stated, the use of Flashcard media can improve student cognition (Ramlah et al., Amirul Mukminin, Siti Raudhatul, 2023). In line with other research which states that there is a cognitive increase in students on Flashcard media on large IPAS material at the end of cycle III. Nurindah S, (2022) this is also supported by other research which states that Flashcard interactive media can increase learning enthusiasm and learning outcomes. In addition, using flashcards media is more effective in developing critical thinking skills. When conducting research, the author experiences something different from previous research. The theme used is IPAS, the independent variable used is cognitive enhancement assisted by interactive media, namely Flashcard, the dependent variable used is cognitive enhancement, the sample used by the author is grade I students.

In addition, the implementation of this study will be supported by relevant research from previous researchers who stated, the use of Flashcard media can improve student cognitive. In line with other research which states that there is a cognitive increase in students on Flashcard media on large IPAS material at the end of cycle III. (Nurindah S, 2022) this is also supported by other research which states that Flashcard interactive media can increase learning enthusiasm and learning outcomes. In addition, the effectiveness of using Flashcard media honing critical thinking skills. Other research states that the application of this interactive media can increase the influence to think more critically so as to get a positive impact. Students can be actively involved in solving each problem, and the use of this media can improve students' cognitive and understanding of learning (Alfiyah et al., Rudy Sumiharsono, Eges Triwahyuni, 2023). Other research also states that problem-based learning models are effective for increasing student participation and achieving better learning outcomes (Furnamasari & Jannah, 2023). Based on observations made by (Rahayuningsih, 2019) in elementary schools many students are less enthusiastic because the learning media is boring, so that it has an impact on students' understanding of being low in acquiring knowledge. Therefore, the researcher selected flashcard media for enhancing students' cognitive skills. The authors' research objective is to demonstrate that the utilization of flashcard media has an influence on cognitive development of students of IPAS Class 1 SDN Sunter Jaya 03. It is expected that this study will benefit cognitive development and provide reference material that the media can be effectively used to improve critical thinking.

2. METHOD

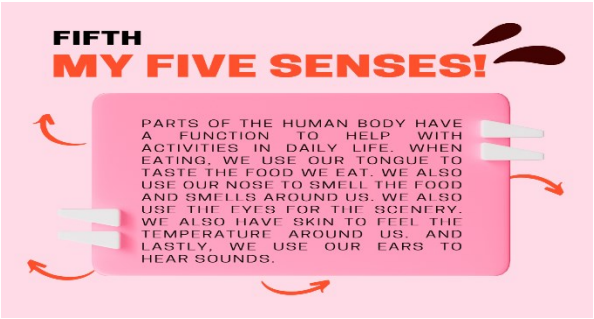
This research employs a quantitative approach utilizing experimental methods consistent with approach of (Berlian et al., Deswanti, Syafaren, 2022). The author uses this approach to research because the experiment explains that it is concerned with the depth of data and has the ability to record as much as possible from the population data of the intended class students. The

results of the study will be compared, namely the control group without the use of flashcard media and the experimental group using Flashcard (Putri, 2022). The design used is pretest-postest, where all students take a pretest first and end with a posttest. The pretest aims to determine the initial state before explaining the material and the postest aims to measure the final state after explaining the material. The research was conducted at SDN SUNTER JAYA 03 to see the cognitive improvement of students on Flashcard media.

The study population consisted of all first-year students. The sample was drawn using saturation sampling method where every member of the population of this study are surveyed using sampling technique. The sample drawn was classes 1A, 1B and 1C with a total of less than 30 students. The instrument to measure cognitive improvement is a written test in multiple choice, short answer and essay format. The written test is conducted in two stages, pre-test and post-test. The instrument used passed the validity test was conducted using the Pearson product-moment correlation coefficient, while the reliability assessment employed Cronbach's alpha coefficient in SPSS. The analysis included calculating the validity of the test items. An item is deemed valid if the computed T-score surpasses the critical T-value.

If the reliability test yields a calculation result of 0.6, meeting the criterion R > 0.6, the instrument is considered unreliable but still usable. This study employs both descriptive and inferential statistical tests for data analysis. Before hypothesis testing, normality and homogeneity tests are conducted to ensure the data's suitability for analysis. The Shapiro-Wilk test is utilized for normality testing since the sample size is less than 30. If the significance level exceeds 5% or 0.05, the data is considered normally distributed. Homogeneity testing is employed because the study compares two classes, ensuring data distribution conformity. In SPSS, an F-count > 0.05 confirms data normality.

Hypothesis testing uses the independent t-test formula to draw conclusions from the treatment results and measure the efficacy of employing educational media with flashcards. This examination looks at Sig. From the coefficient table in the SPSS output, the calculation of the T-test must be greater than the T-table. If the value 0.05 (a = 5%) is greater, H0 is rejected as it is less than the results of the T-test, and H1 is accepted as the T-T test results exceed the significance value of 0.05 and are less than these. Then we have the bound independent variables (Sig. Values) influence individuals. Next, for the mean difference (mean deviation), if the pre-test value is greater than the post-test value, the administered treatment has no effect on increasing the post-test value. If it changes as expected then related to the purpose of the treatment and obtained mean difference (mean deviation), the pretest value will be lower than the posttest value. Then the treatment given is the postest, so it looks effective to increase the calculation. In conclusion, another way, namely the posttest, can be used to study the expected changes, The following Flashcard media design used by the researcher is shown in Figure 1.



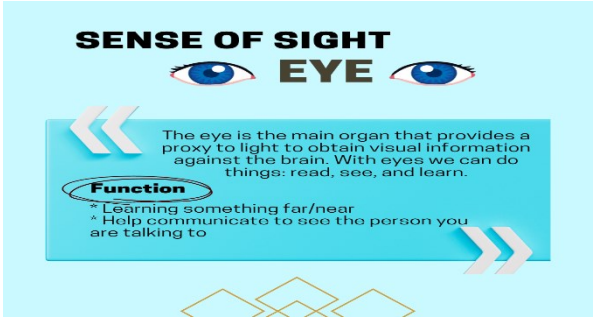


Figure 1. Flashcard Media Design

Table 1. Research Design

Group	Pretest	Treatment	Posttest
Experiment (1A)	T1	X	T2
Control (1C)	T2	Y	T2

Where, T1-T2 : Initial test and final test in the experimental group, T1-T2 : Initial test and final test in the control group, X : Learning with Flashcard media recognition, Y : Learning using Powerpoint

3. RESULTS AND DISCUSSION

Before implementing the intervention, the researchers conducted a pre-test to assess cognitive progress of the students and concluded with a posttest. Interactive flashcards media was used in the experimental classes and PowerPoint was used in the control classes. Initial Data Analysis Table 2.

Table 2. Result Data Pretest

No.	Score	Frequency	Categories
1.	90-100	1	Very High
2.	80-70	8	High
3.	60-50	13	Quite Low
4.	40-30	3	Low
5.	0-20	0	Very Low

According to the table displaying the pre-test results, the number of students scoring between 0 and 20 is 0, which is considered very low. The values between 40 and 30 with a frequency of 4 are classified as low. The value of 60-50 has a frequency of 13 categorized as quite low. The value of 80-70 which has a frequency of 8 is categorized as high. The value of 90-100 which has a frequency of 1 is categorized as very high. After giving treatment, the researcher distributes posttest questions. The Posttest is administered to assess students' cognitive improvement after they have received treatment using Flashcard interactive learning media. The findings from the posttest for the experimental group are displayed in Table 3.

Table 3. Result Data Posttest

No.	Score	Frequency	Categories
1.	90-100	8	Very High
2.	80-70	15	High
3.	60-50	2	Quite Low
4.	40-30	0	Low
5.	0-20	0	Very Low

Based on the table of posttest results, it shows that students with scores 0-20 have a frequency of 0 categorized as very low. The value of 40-30 which has a frequency of 0 is categorized as low. The value of 60-50 which has a frequency of 2 is categorized as quite low. The value of 80-70 has a frequency of 15 categorized as high. The value of 90-100 which has a frequency of 8 is categorized as very high. Following data collection, the researcher performed an initial normality test to ascertain whether the data originated from a population with a normal distribution., which is a requirement for hypothesis testing using pre-mathematical statistics. Since the sample used is less than or equal to 30 samples, the Shapiro-Wilk test for normality of this data is used. Data is normally distributed if > 0.05, but < 0.05 indicates indicating that the data does not follow a normal distribution. Normality tests are shown in Tables 4 and 5.

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Table 4. Class A (Experiment)

		Shapiro-Wilk		
	Statistic	**Statistic**	**Df**	**Sig.**
Class A_Pretest	,208	,927	25	,074
Class A_Posttest	,180	,925	25	,067

Table 4. Class C (Control)

	Shapiro-Wilk		
	Statistic	**Df**	**Sig.**
Class C_Pretest	,922	20	,108
Class C_Posttest	,916	20	,082

Lilliefors Significance Correction

According to tables 3 and 4, the normality tests yielded significant values for the group undergoing the experiment pretest of 0.074 (> 0.05) and the experimental class posttest of 0.067 (> 0.05). Similarly, for the group serving as the control pretest resulted in a significant value of 0.108 (> 0.05), and the posttest had a significant value of 0.082 (> 0.05). Therefore, Based on the significance levels exceeding 0.05, it can be inferred that the sample data follows a normal distribution. After conducting the necessary prerequisite tests, the researchers employed a parametric test, specifically an independent samples t-test, to examine the hypothesis.. Before conducting hypothesis testing, the researcher conducted a descriptive statistical test, in which the data to be presented in this descriptive statistic. Among them: range, maximum score and minimum score, average (mean), standard deviation, and variance as found in table 5.

Table 5. Descriptive Statistical Test

	N	**Range**	**Min**	**Max**	**Mean**	**Std. Deviation**	**Variance**
Postest_ek sperimen	25	29	71	100	89.72	7.436	55.293
Postest_kontrol	20	50	50	100	61.25	12.674	160.618
Pretest_ek sperimen	25	46	50	96	72.56	9.887	97.757
Pretest_kontrol	20	25	35	60	50.45	7.258	52.682
Valid N (listwise)	20						

According to the descriptive statistics table, the mean score of the pre-test was 72.56 for the experimental group and 50.45 for the control group. The standard deviation (SD) was 9.887 for the experimental group and 7.258 for the control group. The range was 46 for the experimental class and 25 for the control class, with minimum scores of 50 for the The experimental group had 96 as their highest score, while the control group's highest score was 35. 60 for the control class, the variance would be 97.757 The experimental group had an average score of 96, whereas the control group had an average score of 52.682.

In the post-test, the average score was 89.72 for the experimental group and 61.25 for the control group. The experimental group had a standard deviation of 7.436, while the control group had a standard deviation of 12.674. The range of scores was 29 for the experimental group and 50 for the control group. The lowest score in the experimental group was 71, while in the control group, it was 50, indicating that the experimental class reached a maximum of 100 in comparison to the control group. The variance was 55.293 for the experimental class and 160.618 for the

control class. The mean learning outcome for the experimental class was 72.56 in the pre-test and 89.72 in the post-test, while for the control class it was 50.45 in the pre-test and 61.25. In summary, descriptively, there appears to be a noticeable difference between the mean learning outcomes of the pre-test and post-test.

Furthermore, the researchers conducted a t-test hypothesis to examine the impact of Flashcard media on cognitive improvement among first-grade students at SDN Sunter Jaya 03. The criteria for decision-making relied on the significance level (Sig.). If Sig. < 0.05, The null hypothesis (H0) would be discarded in favor of the alternative hypothesis (H1).. Conversely, if Sig. > 0.05, H0 would be accepted and H1 rejected. Additionally, the decision-making criteria involved comparing the calculated t-value with the critical t-table value. If the calculated t-value exceeded the critical t-table value, H0 would be rejected. Conversely, If the calculated t-value was lower than the critical t-table value, H0 would be upheld.

Based on the findings in Table 6 from the Independent Sample The T-test results indicate a two-tailed significance value (Sig.) of 0.000. According to In decision-making criteria, when the significance value is 0.000 and less than 0.05, (H0) is discarded in favor of the alternative hypothesis (H1). Therefore, it can be inferred that there is a statistically significant difference between the test results before and after the implementation of the interactive learning tool, Flashcards. Furthermore, comparing the t-score values, as per Table 6, the t-score is 6.101, while the critical t-value is 0.571. Since 6.101 > 0.571, it can be concluded that there is a noticeable difference between the test results before and after utilizing the interactive learning medium, Flashcards.

This discussion will present the findings of the data analysis, specifically the normality assessment of the Pretest and Posttest scores using the independent samples t-test, as well as the results of instrument validation and reliability testing. These instruments were utilized in the study to were test problems of 15 multiple choices, 3 descriptions, 4 essays with a total of 22 questions. After conducting the validity test, there were 10 multiple choice questions that were declared valid, so researchers used 17 questions to perform Pretest and Postest. The researcher also conducted a reliability assessment of the instrument, yielding a highly satisfactory score of 0.778. Therefore, it can be concluded that the instruments used in the study are reliable and meet the necessary criteria.

Table 6. Independent sample t-test

		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
									95% Confidence Interval of the Difference	
		F	**Sig.**	**T**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Lower**	**Upper**
NILAI	Equal variances assumed	4.184	.047	6.101	43	.000	18.470	3.027	12.365	24.57
	Equal variances not assumed			5.771	29.156	.000	18.470	3.200	11.926	25.014

3.1. Final Data Analysis

Once the research data is obtained, the research performs a functioning data normality test To ascertain whether the data collected from the sample follows a normal or non-normal study used the normal humming firearms using the Shapiro Wilk because the samples used were less than 30 years old. The results obtained from the normality test day are normal distributed data so that the research can continue the penguin with parametric statistics to provide an answer to the proposed problem formula. Based on the results of the conducted study at SDN Sunter Jaya 03 on IA and IC, before and after daring to produce significant differences. Seen from the average Posttest of the experimental group scored 89.72 in the post-test, while the control group 61.25 so that it is proven in the average control class below *kkm.*

To test the research hypothesis using Using an independent samples t-test, the study aimed to ascertain if there exists a noteworthy distinction when applying Flashcard media to enhance students' cognitive abilities across two different classes. The results of the independent samples t-test rejected the null hypothesis (H0) and accepted the alternative hypothesis (H1), indicating a significant difference in test scores before and after implementing Flashcard media. This was supported by a t-score of 6.101, which exceeded the critical t-value of 5.771. Therefore, it can be concluded from the hypothesis test that the use of Flashcard media leads to increased cognitive improvement among first-grade students in elementary school. In providing treatment in this study, researchers used learning media that could cover these assessment indicators, namely in the form of Flashcard media. By employing this media, students' cognitive abilities can be enhanced throughout the learning process, enabling them to identify the different types of five senses, understand their functions, and recognize their practical applications in daily life. This is facilitated by visual explanations and the substantial size of the Flashcard. This is in line with the findings which state that using Flashcard media can increase student cognition because with this media students can solve problems and make students more active (Maryanto & Wulanata, 2018). Another study demonstrated that the use of Flashcard media can heighten students' motivation to learn and improve academic performance. (Febriyanto & Yanto, 2019). Furthermore, the utilization of Flashcard media captures students' attention effectively due to its large size, engaging them in answering questions embedded within the Flashcards, thereby preventing boredom. Consequently, in line with previous research findings, it can be concluded that tangible educational tools like Flashcards substantially enhance cognitive learning among first-grade elementary school students. In figure 2 is an outline of the learning process using interactive Flashcard media.

Figure 2. Learning Process Using Interactive Flashcard Media

4. CONCLUSION

With the use of Flashcard interactive media there are very good qualifications from experts and students, so this media is feasible to use in learning and looks quite effective in improving students' cognitive to be more critical thinking. Flashcard interactive media can increase student enthusiasm to be more active in learning and increase student understanding because there is concrete media. This is supported by the independent sample t-test, revealing a significance value of 0.000, which is less than 0.05, indicating statistical significance. This places it within the high-value category. The findings suggest that all assessment criteria were met through the introduction of the five senses and their functions. This is evident from the increased Pretest and Posttest scores in classes 1A and 1C during IPAS learning. Therefore, this interactive media can serve as a viable educational tool in elementary schools, enhancing critical thinking skills among first-grade students.

REFERENCES

Aghni, R. I. (2018). Fungsi Dan Jenis Media Pembelajaran Dalam Pembelajaran Akuntansi. *Jurnal Pendidikan Akuntansi Indonesia*, *16*(1). https://doi.org/10.21831/jpai.v16i1.20173

Alfiyah, N., Sumiharsono, R., & Triwahyuni, E. (2023). Pengaruh Penggunaan Media Flash Card Terhadap Perkembangan Kognitif Dan Kemampuan Berhitung Sederhana Anak TK (The Effect of Using Flash Card Media on Cognitive Development and Simple Numeracy Skills in Kindergarten Children). *EDUKASIA: Jurnal Pendidikan Dan Pembelajaran*, *4*(2), 1425–1434. https://doi.org/10.62775/edukasia.v4i2.457

Anisa, A. F. Y., & Attamimi, N. (2023). Implementasi Media Flash Card Untuk Meningkatkan Kemampuan Membaca Pada Anak Usia Dini Alifah. *Ash-Shobiy: Jurnal Pendidikan Islam Anak Usia Dini Dan Al-Qur'an*, *2*(2), 116–125.

Arisoy, B., & Aybek, B. (2021). The effects of subject-based critical thinking education in mathematics on students' critical thinking skills and virtues*. *Eurasian Journal of Educational Research*, *2021*(92), 99–120. https://doi.org/10.14689/ejer.2021.92.6

Budiyono, B. (2020). Inovasi Pemanfaatan Teknologi Sebagai Media Pembelajaran di Era Revolusi

4.0. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *6*(2), 300. https://doi.org/10.33394/jk.v6i2.2475

Febriyanto, B., & Yanto, A. (2019). Penggunaan media Flash Card untuk Meningkatkan Hasil Belajar Siswa Sekolah Dasar Use of Flash Card Media to Improve Elementary Schools ' Student Learning Outcomes Budi Febriyanto , Ari Yanto. *Jurnal Komunikasi Pendidikan*, *3*(2), 108–116.

Furnamasari, Y. F., & Jannah, A. N. (2023). Peningkatan Membaca Permulaan Melalui Media Flash Card Pada Peserta Didik Kelas 1 UPTD SDN 1 Juntinyuat. *Jurnal Inspirasi Pendidikan (ALFIHRIS)*, *1*(3), 2964–6294. https://doi.org/10.59246/alfihris.v1i3.359

Inggrida, P., Christiana, E., Pd, S., Pd, M., Studi, P., & Konseling, B. (2019). *Penggunaan Media Flashcard Terhadap Kemampuan Kognitif Mengenal Konsep Bilangan 1-10 Di Kelompok A Tk Islam Insan Al-Firdaus*.

Insyirah Shafa, Zulham Siregar, N. H. (2021). Jurnal Basicedu. *Jurnal Basicedu*, *5*(4), 2156–2163. Iskandar Batubara, D., Kusmanto, H., Nasution, A., & Purba, A. (2021). *Management Of Education*

Quality Improvement At Education Council Al Washliyah North Sumatra. *8*(February 2021), 354–364. https://doi.org/10.2991/icosop-17.2018.55

Israwati, I., Lukman, L., & Hamid, A. N. (2022). Efektivitas Media Flashcard Untuk Meningkatkan Kemampuan Kognitif Anak Usia Dini. *Sultra Educational Journal*, *2*(1), 1–9. https://doi.org/10.54297/seduj.v2i1.214