THE EFFECTIVENESS OF INTERACTIVE LITERATURE STUDY LEARNING MODEL ON SOCIO SCIENTIFIC ISSUE (SSI) IN LEARNING IPAS

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Abstract

The purpose of this study was to find the level of effectiveness of the study cluster learning model in socio scientific issues in IPAS learning in class V. The type of research was quantitative. The type of research is quantitative. The population was grade V elementary school (SD) in Dagangan sub-district, Madiun district. The sampling technique used was random sampling. The research samples were SD Negeri Ngranget and SD Negeri Nambangan Lor 01, each with 20 students. The data source is IPAS learning with the material Let's Get Acquainted with Our Earth. Data were collected through tests and analyzed using Paired t-tests and N-gain tests for effectiveness. The results showed that the Paired t-test test for the post-test results of the experimental group obtained data that was significant (2-tailed) less than 0.05 (Sig < 0.05) so it can be interpreted that there is a difference; N-gain effectiveness test = 76.49% with very high criteria. In conclusion, the studysaster learning model has improved the understanding of socio scientific issues in IPAS learning.

Keywords: *Learning Model, Interactive Studysaster, IPAS Learning, Sociology Scientific Issue*

Introduction

A learning model, according to Manalu & Prawijaya (2023), is a series or special procedures designed to arouse students' interest in the subject matter. This model covers the entire learning process from start to finish by utilizing various approaches, methods, strategies and techniques. This approach aims to ensure that learning is not only theoretical, but also practical and interesting for students. This is in line with Ardianti's view in Putri, et al (2022) which states that the learning model includes various elements that work together to create a comprehensive and effective learning experience.

Meanwhile, Sertiana Siahaan (2022) describes the learning model as a display chosen to illustrate various options in preparing the learning syntax. It reflects the detailed structure of how learning should be implemented. Magdalena, et al (2024) added that learning models also function as plans or patterns that can be used

to design long-term learning plans, develop teaching materials, and guide the implementation of learning both in the classroom and in other environments. Thus, the learning model is not just a teaching method, but also a strategic guide that helps educators in planning and implementing learning effectively and efficiently.

Studysaster learning is a learning model that aims to educate students about disasters (in this case Covid-19) and is able to produce products (Widyasari, 2020). The studysaster learning model is a systematic learning stage in organizing learning experiences, to maximize the integration of disaster education (FItroni, 2020). Studysaster is an innovation in the form of a learning model to integrate disaster education in teaching and learning activities. The aim is to increase interest in disaster learning (Suryani, 2022). From the opinions of several experts above, it can be concluded that studysaster is a learning model that in its learning stages contains education about disasters and is able to produce products about disaster management.

Studysaster is a combination of words derived from the word "study" which in Indonesian means learning and "disaster" which means disaster (Widyasari, 2020). The strategy used in this learning is more oriented to the learning process. This model has six learning steps, namely Identification; Search; Plan; Create; Share; and Practise. This learning strategy is more oriented to the learning process. In this context, students also need to understand what learning means, what benefits are obtained. That way students get a provision for life in dealing with a disaster from the impacts caused, one of which is a way of prevention. So that learners have life skills about the importance of health and empathy.

IPAS is a combination of Natural Sciences (IPA) and Social Sciences (IPS) which is now a new subject in the Merdeka Curriculum. According to Dr. Hattarina (2022), Natural and Social Sciences (IPAS) studies living and non-living things in the universe and their interactions (IPS Basic Education, 2023: 127). In addition, according to the Big Indonesian Dictionary (2016), IPAS studies human life as an individual and social creature that interacts with its environment. The incorporation of Natural Sciences (IPA) and Social Sciences (IPS) in the IPAS subject in the Merdeka Curriculum has important benefits (Budiwati et al., 2021). Learners need to understand scientific knowledge and the social life around them. Mimin (2021) argues that the integration of local wisdom in IPAS learning also plays a role in preserving and fostering love for local wisdom. According to Nugroho et al. (2019) the use of IPAS modules can increase students' interest during the learning process.

The Socio Scientific Issues learning strategy is expected to support learning activities and provide the right situation for students' potential to develop so that the learning objectives can be achieved (Siska et al., 2019). The socioscientific approach is an approach that aims to stimulate intellectual, moral and ethical development and awareness of the relationship between science and social life. Socioscientific issue is a representation of problems in social life that are conceptually related to science. The learning strategy that is considered to improve science literacy skills and meet the criteria of science literacy components is the Local Socioscientific Issues (SSI) Learning Strategy with OE3C Instructional. The cornerstone of this educational approach is to provide students with SSI-based tasks that can be used to promote and test science literacy, make decisions, and participate in debate and discussion activities.

The Socio Scientific Issues approach is one of the 21st century skills-oriented science learning approaches. According to Zeidler and Nichols socioscientific issues can connect scientific concepts with real issues that exist in society. Socio-scientific issues are issues that are based on scientific concepts or problems, are controversial in nature, are a common conversation in society, and are often subject to political and social influences. The function of socio-scientific issues that can raise arguments from one's reasoning to make conclusions or justifications, concept understanding also has a relationship with one's argumentation skills.

The relevant research is research from Irfan Syahrudi (2023) entitled "Application of Studysaster Learning in Islamic Religious Education Subjects during the Covid-19 Pandemic at Sukajaya 04 Cibitung State Elementary School". In learning using the studysaster learning model, students produce work in the form of covid-19 prevention posters that are inserted in Islamic religious subjects at school, with these results students can educate students in order to break the chain of spread and transmission of covid-19 to the surrounding community and society at large. In addition, the prevention of covid-19 is also carried out by means of education that is inserted in the middle of the lesson activities. The conclusion of this research is that PAI learning can be developed with a variety of methods including studysaster for the success of learning during the covid-19 pandemic.

Research from Bety Indri Puspitarini (2022) entitled: The Use of the Studysaster Model in Online Learning in an Effort to Improve Indonesian Language Learning Outcomes in Grade 5 Students of Kyai Ibrahim Elementary School Surabaya 2020-2021 School Year. The conclusion of this study is that there is an increase in learning outcomes because teachers use the studysaster learning model in Indonesian language learning about print and electronic media advertising material. Through the use of the studysaster model in learning, students can educate themselves and can educate others from the work that has been created. That way students get a provision for life in dealing with a disaster from the impact caused. In this effort, the teacher as a facilitator and motivator needed by students in the learning process conducts class action research using the studysaster learning model in the preparation of lesson plans. This can be seen from the behavior or attitude of students when participating in learning, students look active and enjoy the learning process.

The description above directs researchers to focus on the effectiveness of the application of the studysaster learning model in socio scientific issues. So that researchers can formulate the formulation of the problem, namely: how is the effectiveness of the Study Saster Interactive learning model on Socio Scientific Issue (SSI) in IPAS learning. The purpose of this research is to find the level of effectiveness of the studysaster learning model in socio scientific issues in IPAS learning in grade V elementary schools in Dagangan sub-district, Madiun district.

Research Methods

This type of research is quantitative with an experimental approach. Ibrahim, at all, (2018: 55) explains that experimental research is a type of research that analyzes several variables, more than two, by giving treatment to the independent variable and then measuring the dependent variable. The independent variable in this study is the interactive cluster study learning model and the dependent variable is the socio scientific issue (ssi). The design in

this research is quasi-experimental. Dantes (2017) states that quasi-experimental is often called a pseudo-experiment whose design is a nonequivalent control group design. The quasi-experimental research in this study used two groups, namely: experimental group and control group. The experimental group received treatment by applying the project-based learning model with the help of design thinking. While the control group implemented conventional learning.

The population was fifth grade students in Dagangan sub-district, Madiun district, East Java. Sampling using random sampling which is then determined based on the lottery number to select two elementary schools. The control group was SD Negeri Ngranget and the experimental group was SD Negeri Nambangan Lor 01, each of which had 20 students. The sampling technique used in this study was saturated sampling. (Hardani, et all, 2020: 369) explains that saturated sampling is a way of selecting samples by including all members in the population.

The data source in this study is learning Natural and Social Sciences (IPAS), while the data is a test. Data collection techniques using tests with material Let's Get Acquainted with Our Earth IPAS subjects. The IPAS test instrument has been tested for validity, reliability, difficulty level, and distinguishing power. The initial stage of data processing, are: Normality test, homogeneity test, and Paired sample t-test, in this study, researchers used the help of the SPSS version 26 program. Meanwhile, to measure the effectiveness of the Interactive Science Study learning model on Socio Scientific Issue (SSI) in IPAS learning, using the normalized N-gain test (Hake, 1999: 1) with the formula:

$$N - gain = \frac{S_1 - S_2}{S_{\max ideal} - S_2}$$

Description:

S_1 = post-test score

S2 = pre-test score

S max-ideal = ideal maximum score that can be obtained by students

Conclusions were drawn using criteria based on the following table

Table 1. N-gain grouping criteria

Tabel 1. Kriteria pengelompokan $N - gain$

$N - gain$	Kriteria
$N - gain \geq 0{,}7$	Tinggi
$0{,}3 \leq N - gain < 0{,}7$	Sedang
$N - gain < 0{,}3$	Rendah

To evaluate the significant effectiveness of the treatment given, the requirement that must be met by the N-gain is at least 0.3 as listed in the table above.

Results and Discussion

Results

The research was conducted at SD Negeri Ngranget as the control group and the experimental group was SD Negeri Nambangan Lor 01 in Dagangan sub-district, Madiun district. Each group will be given a pre-test before any learning treatment and post-test after treatment. Data analysis of the pre-test results of the two groups is

intended to determine the effectiveness of understanding the socio scientific issue in learning IPAS with the material of let's get acquainted with our earth. The data on the test results of the control and experimental groups are presented in the table as follows:

Table 2. Descriptive Statistics of Pre-Test Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Kelompok Control	20	62.00	78.00	67.7600	5.23946
Kelompok Eksperiment	20	61.00	76.00	66.3500	5.15413
Valid N (listwise)	20				

The results of table 2. obtained data that the minimum scores for the control and experimental groups were 62.00 and 61.00, respectively. The maximum values for the control and experimental classes were 78.00 and 76.00 respectively. The mean of the control and experimental groups were 67.76 and 66.35 respectively, with the standard deviations of the control and experimental groups being 5.24 and 5.15.

Data analysis of the post-test results of the two groups was intended to determine the ability of the experimental group after the treatment of the studysaster learning model and conventional learning for the control class in learning IPAS with let's get acquainted with our earth. The data on the post-test results of the control and experimental groups are presented in the table as follows:

Table 3. Descriptive Statistics of Post-Test Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Kelompok Control	20	68.00	81.00	75.7500	5.62432
Kelompok Eksperiment	20	75.00	100.00	93.6000	4.45221
Valid N (listwise)	20				

The results of table 3. obtained data that the minimum scores for the control and experimental groups were 68.00 and 81.00, respectively. The maximum values for the control and experimental classes were 75.00 and 100.00 respectively. The mean of the control and experimental groups were 75.75 and 93.60 respectively, with the standard deviations of the control and experimental groups being 5.62 and 4.45.

The test data were analyzed for prerequisite tests which included normality and homogeneity tests. Gunawan (2020: 52) explains that the normality test is used to know that the data and population used in research are normally distributed so that they are included in Parametric statistics. Enterprise (2018: 53) explains that decision making is considered from Significance (sig)> 0.05 then the data is normally distributed, whereas if the value at Significance (sig) <0.05 then the data is not normally distributed. This study uses Shapiro-Wilk test statistics because the number of samples is less than 50.

Table 4. Normality Test Results

Test of Normality						
Score Learning Outcomes	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test kel. Kontrol	.141	20	.001	.815	20	.241
Post-tes ke. Kontrol	.246	20	.002	.823	20	.250
Pre-test kel Eksperiment	.185	20	.003	.765	20	.242
Post-test kel. Eksperiment	.247	20	.002	.771	20	.362

The results of the calculation of SPSS version 26, the normality test with Shapiro-Wilk obtained data that the significant learning test results of both the control and experimental groups were above 0.05 (Sig> 0.05). This can be interpreted that the test results are normal data.

The pre-test test results of the control group and the experimental group were then tested for homogeneity. Gunawan (2020: 53) explains that the homogeneity test is a test to determine that the variants of the research population are homogeneous or heterogeneous. If the value at significance (Sig) > 0.05 so that the variants of two or more data groups are said to be homogeneous.

Table 5. Homogeneity Test Results

Test of Homogeneity of Variance				
Learning outcomes	Levene Statistic	df1	df2	Sig.
Based on Mean	4.526	1	38	.541
Based on Median	4.467	1	38	.552
Based on Median and with adjusted df	4.467	1	37.612	.552

Based on trimmed mean	4.525	1	38	.541

The results of the SPSS version 26 calculation, the Homogeneity test obtained data that the significant results of the Post-test learning test results of the control and experimental groups were above 0.05 (Sig> 0.05). It can be interpreted that the Post-test learning outcomes of the two groups are homogeneous.

The learning outcomes of the control and experimental groups need to be seen the average difference with the Paired sample t-test test. Using the Paired sample t-test test because the amount of data is less than 100 (the data is small). The description of the mean difference for the experimental group is presented in the table below:

Table 6. Experiment Mean Difference Data

Paired Samples Statistics				
Pair 1	Mean	N	Std. Deviation	Std. Error Mean
Pre-test Eksperiment	66.36	20	5.154	1.087
Post_test Eksperiment	93.60	20	4.452	1.206

The mean difference for the control group is presented in the table below:

Table 7. Control Mean Difference Data

Paired Samples Statistics				
Pair 1	Mean	N	Std. Deviation	Std. Error Mean
Pre-test Control	67.76	20	5.239	1.120
Post-test Control	75.75	20	5.154	.909

The average increase of the experimental group and control group was 27.24 and 7.99, respectively.

The data from the Paired Sample t-test test results are as follows:

Table 8. Paired Sample T-Test

Paired Samples Test								
	Paired Differences							
				95% Confidence Interval of the Difference				
Pair 1	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pre-test Eksperiment - Post_test Eksperiment	-27.240	4.4523	1.063	-17.511	-14.976	-16.184	19	.000

The results of the Paired Sample T-Test test found that the significant (2-tailed) is less than 0.05 (Sig < 0.05), so it can be interpreted that there is a difference or in other words, the average difference in the experimental group is significant increase.

The results of the N-gain calculation, as follows:

S1 = 1823; S2 = 1247; SIdeal = 2000

$$N-gain = \frac{1823 - 1247}{2000 - 1247}$$

N-gain=0.7649

The results of the N-gain calculation obtained 0.7649 or 76.49% with very high criteria.

Discussion

The Interactive Science Study learning model on Socio Scientific Issue (SSI) in IPAS learning with the material of let's get acquainted with our Earth proved to be effective. This is evident from the increase in the average learning outcomes of the experimental group which is 27.24 compared to the control group which rose 7.99. In addition, it is also evidenced by the achievement of N-gain which is 76.49% with very high criteria.

The effectiveness of the Studysaster learning model has six learning steps to achieve learning objectives. The six steps, namely Identification, provide input to teachers to provide opportunities for students to find problems and identify; Search, which provides opportunities for students to plan forms of learning and identify learning media that are useful and in accordance with IPAS learning objectives; Plan, which is the teacher provides a learning structure by adjusting the stages of cognitive development of students and internalizing character values; Create, which is the teacher provides opportunities to build knowledge through exploration; Share, and Practise, which is the teacher provides opportunities for students to share in the form of presenting the results of knowledge built. At the communication stage, students explain the concept of media or work, the steps of making, and practice through video. So the studysaster learning model of Socio Scientific Issue (SSI) in IPAS learning has proven effective in improving learning outcomes in grade V elementary schools in Dagangan sub-district, Madiun district.

Conclusion

Studysaster learning model on Socio Scientific Issue (SSI) in IPAS learning has been proven effective in improving learning outcomes in grade V elementary schools in Dagangan sub-district, Madiun district, with an effectiveness value of 76.49% with very high criteria.

Bibliography

1. Amalia, N. F., Riandi, R., Widodo, A., & Rochintaniawati, D. The Complexity of Argumentation Regarding Socioscientific Issue at Elementery, Middle, and High School. Assimilation: Indonesian Journal of Biology Education, 1(1), 29-32.

2. Budiwati, dkk. (2021). Analisis Buku IPAS Kelas IV Kurikulum Merdeka Ditinjau dari Miskonsepsi. Jurnal BASICEDU, 7(1), 523 – 534.

3. Dantes. (2017). Desain Eksperimen dan Analisis Data. Depok: PT RajaGrafindo Persada.

4. Enterprise, J. (2018). SPSS Komplet untuk Mahasiswa (Tutorial Komprehensif untuk Memahami SPSS Bagi Para Mahasiswa). Jakarta: PT Elex Media Komputindo.

5. Gunawan, C. (2020). Mahir Menguasai SPSS (Panduan Praktis Mengolah Data Penelitian). Yogyakarta: Deepublish

6. Hardani; Andriani, Helmina; Ustyawati, Jumari; Utami, Evi Fatmi; Istiqomah, R. R. F. S. A. (2020). Metode Penelitian Kualitatif Kuantitatif. Yogyakarta: CV Pustaka Ilmu.

7. Hattarina, S., Saila, N., Faradilla, A., Putri, D. R., & Putri, R. G. A. (2022, August). Implementasi Kurikulum Medeka Belajar Di Lembaga Pendidikan. In Seminar Nasional Sosial, Sains, Pendidikan, Humaniora (SENASSDRA), 1(1), 181-192).

8. Hermawan, I., & Waluyo, K. E. (2023). Penerapan Pembelajaran Studysaster Pada Mata Pelajaran Pendidikan Agama Islam Di Masa Pandemi Covid-19 Di Sekolah Dasar Negeri Sukajaya 04 Cibitung. Al-Ulum Jurnal Pemikiran dan Penelitian ke Islaman, 10(3), 219-228.

9. Ibrahim, Andi; Alang, Asrul Haq; Madi; Baharuddin; Ahmad, M. A. D. (2018). Metodelogi Penelitian. Makassar: Gunadarma Ilmu.

10. Irfan Syahrudi. (2023). Penerapan Pembelajaran *Studysaster* pada Mata Pelajaran Pendidikan Agama Islam di Masa Pandemi c*ovid-19* di Sekolah Dasar Negeri Sukajaya 04 Cibitung. Jurnal Al-Ulum: Jurnal Pemikiran dan Penelitian Ke-Islaman, 10(3), 219-228.

11. Magdalena, I., Agustin, E. R., & Fitria, S. M. (2024). Konsep Model Pembelajaran. Sindoro: Cendikia Pendidikan, 3(1), 1-10.

12. Mahsun, A., dkk. (2023). IPS Kependidikan Dasar. Jawa Timur: Nawa Litera Publishing.

13. Manalu, J. P., & Prawijaya, S. (2023). Pengaruh Model Pembelajaran Scrambleterhadap Motivasi Belajar Siswa pada Tema 1 Subtema 1 Kelas V SD Negeri 106453 Suka Damai. Jurnal Pendidikan Tambusai, 7, 20200–20206.

14. Maulidiawati, T., Irianto, A., & Rachmadtullah, R. (2023). Strategi Local-Sosiosaintific Issues Dengan OE3C Instructional Terhadap Kemampuan Literasi Sains Siswa Di Sekolah Dasar. Jurnal Arjuna: Publikasi Ilmu Pendidikan, Bahasa dan Matematika, 1(5), 52-61.

15. Mimin. (2021). Pentingnya Nilai-Nilai Kearifan Lokal Suku Ngalum Ok Dalam Kurikulum PAUD Guna Menghasilkan Siswa Berkepribadian Unggul. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 7(4), 4500-4512.

16. Nugroho, P. A., & Puspitasari, Y. D. (2019). Pengembangan modul praktikum pencemaran lingkungan berbasis inkuiri terbimbing berkolaborasikan video untuk meningkatkan sikap peduli lingkungan dan hasil belajar mahasiswa. *JIPI (Jurnal IPA dan Pembelajaran IPA)*, *3*(2), 42-61.

17. Puspitarini, B. I. (2022). Penggunaan Model Studysaster pada Pembelajaran Daring dalam Upaya Meningkatkan Hasil Belajar Bahasa Indonesia pada Siswa Kelas 5 SD Kyai Ibrahim Surabaya Tahun Pelajaran 2020-2021. PTK: Jurnal Tindakan Kelas, 2(2), 101-112.

18. Putri, A. R., Ardianti, S. D., & Ermawati, D. (2022). Model Scramble Untuk Meningkatkan Kemampuan Membaca Pemahaman Siswa. Jurnal Educatio FKIP UNMA, 8(3), 1192–1199.

19. Purwaningrum, N. A., & Fauziah, H. N. (2022). Pengaruh pembelajaran inquiri terbimbing berbasis socioscientific issue terhadap kemampuan scientific reasoning peserta didik di MTs Negeri 7 Madiun. Edukasia: Jurnal Pendidikan Dan Pembelajaran, 3(1), 45-62.

20. Sertiana Siahaan. (2022). Peningkatan Hasil Belajar Peserta Didik Dengan Model Pembelajaran Advance Organizer Dalam Pokok Bahasan Materi Anak SMA Boleh Pacaran Pada Mata Pelajaran Pendidikan Agama Kristen. Jurnal Ilmu Pendidikan Dan Sosial, 2(1), 127–136.

21. Suryani, N. A., Suryani, S., & Desiana, N. (2022). Pengembangan Pembelajaran Studysaster terhadap Covid-19 Berbasis Teknologi Informasi. Jurnal Ilmu Pendidikan (JIP) STKIP Kusuma Negara, 14(1), 46-52.

22. Tumangkeng, J. V. (2022). Penggunaan Pendekatan Sosiosaintifik Dalam Pengembangan Dan Implementasi Rancangan Tugas Tematik Banjir Pada Siswa SMP Negeri 3 Tahuna. Charm Sains: Jurnal Pendidikan Fisika, 3(3), 143-151.

23. Widyasari, E. (2020). Model Pembelajaran Studysaster Dalam Upaya Meningkatkan Imunitas pada Pandemi Covid-19. In Social, Humanities, and Educational Studies (SHEs): Conference Series (Vol. 4, No. 2).