APPLICATION OF THE GUIDED INQUIRY LEARNING MODEL TO INCREASE STUDENT LEARNING MOTIVATION

Chilya Choirun Nisa* and Dyah Astriani

Department of Science Education, Faculty of Mathematics and Natural Sciences, Universitas Negeri Surabaya, Indonesia

*Email: chilya.18038@mhs.unesa.ac.id

Abstract: The purpose of the study was to describe the application of the guided inquiry learning model to increase students' motivation to learn about energy in life topics. This research is a descriptive study involving 20 class VII-E SMP Muhammadiyah Sidoarjo Indonesia students in the Academic Year 2021/2022. This research is pre-experimental research with one group pretest-posttest design. The instruments used are motivational tests and questionnaires. The data analysis technique used is the normality test and the Wilcoxon test. The research data collection was carried out using the test and questionnaire method. The instrument used was a learning motivation questionnaire. Hypothesis testing using the Wilcoxon test. The data analysis and discussion results show an increase in learning outcomes with an average N-Gain of 0.61, which has moderate criteria. Questionnaire responses obtained 87.2% in the high category. The Wilcoxon test showed a significance score of <0.05, meaning a significant difference between the pretest and posttest scores. It can be concluded that applying the guided inquiry model increases learning motivation.

INTRODUCTION

Education is a basic need in upholding and growing the potential of human resources. Education is a correlation method to encourage the learning process. Law No. 20 of 2003 states that: study programs plan and knowledge have a scheme, capacity, and materials learning with the rules that will be used as a guide, and the implementation of these activities meets the objective of education [1]—fixing quality by implementing a scientific approach to realize learning focused on the subject of education. Students' ability is encouraged to find, explore, apply, investigate and assess. Scientific approach, students carry out activities, namely observations, questions, experiments, management, presentation, and conclusions. In addition, learning leads to a balance and improvement of non-technical and technical skills, covering aspects of attitude, expertise, and understanding.

The 2013 curriculum has the goal that students can develop personal knowledge based on applied learning resources. In learning resources, the student worksheet does not cover students' activeness in terms of understanding, problem-solving, and concepts on low-level material [2]. The learning process will move proficiently, conducive, innovative, fun, and exciting if assisted by presenting material, one of which is worksheets [3]. For this reason, there must be a type of learning that plays a more critical role in supporting the learning process, one of which is the scientific method of guided inquiry learning.

Natural Sciences or Natural Sciences is an essential component of natural science that has four essences: method, application, attitude improvement, knowledge, and application [4]. Science-based learning will lead students to determine their knowledge [5] and focus on inquiry [6] so that it is expected to make it easier for students to understand material about nature in depth.

Based on interviews that have been carried out at SMP Muhammadiyah Sidoarjo, the results show that they tend to use the lecture method, and do not display other learning styles, so students easily feel bored when learning takes place, and there is a lack of motivation to learn in students. Motivation is a driver of students in determining success. The motivation of students can encourage learning to achieve maximum results.

The following is relevant research regarding the application of the guided inquiry model to increase learning motivation that has been carried out and positively influences students. Learning by applying guided inquiry based on animated videos can increase students' learning motivation [7-8].

According to Clayton Alderfer [9], learning motivation refers to the tendency of students to engage in activities that are encouraged to achieve optimal values or learning outcomes. Motivation plays an important role in providing enthusiasm in learning and is considered important in terms of function and value, so there is an urge to influence behavior [10]. The factors that influence learning motivation, namely internal factors, are factors from within themselves which are the willingness to learn, intelligence, and health status so that they can increase learning motivation.[11]. With the motivation to learn, students will work harder, be persistent and focus on learning. Learning efforts in schools need to be done to encourage learning motivation[12].

Inquiry learning is described as the process of students finding new knowledge that is meaningful and useful because it invites students to carry out

processes, such as understanding scientific questions and problems, formulating problems, compiling, combining, and describing data, and preparing results based on scientific problems and phenomena.[13]. A learning model is needed to increase motivation to influence students' reasoning and high curiosity. Guided inquiry is expected to be able to overcome these problems. Inquiry is a form of guidance that focuses students on building new designs based on critical thinking through experimental activities[14]. In guided inquiry learning, students can collect information by conducting analytical experiments to obtain facts and information appropriate to solve problems[15].

RESEARCH METHODS

The research was held at SMP Muhammadiyah Sidoarjo for the 2020/2021 academic year. This type of research uses pre-experiments. The design applied was one group pretest-posttest design. The sample used in the study was 20 students in classes VII-E. In the research design, before learning, the subject was given a pretest to find the students' initial skills (O1). Research subjects included treatment (X) by implementing the guided inquiry learning model assisted by LKPD, after which the subjects were distributed posttest (O2)[16]. The data collection techniques used were motivational tests and questionnaires. The test was carried out two times before (pretest) and after (posttest), and the treatment was given. Questionnaires were given to capture student responses about learning with the guided inquiry model assisted by worksheets.

The pretest and posttest results were used to carry out the normality test and the Wilcoxon test to determine learning motivation. The motivation questionnaire was submitted to students to see their responses to guided inquiry learning. The calculation of the questionnaire is based on the following Likert scale:

The data collection methods used include the following table 1.

Table 1. Learning Implementation Criteria

Score	Criteria
4	Very Good
3	good
2	Enough
1	Not Good

The results of the student data are then analyzed using the percentage of responses to each statement that has been submitted using the formula:

$$\text{Percentage} = \frac{\text{Number of values obtained}}{\text{Maximum value}} \times 100\%$$

The following are the criteria for student questionnaire responses:

Table 2. Response Criteria on Questionnaire

Response	Criteria
85%$\leq$ response	Very High
70% Response < 85%	High
50% Response < 70%	Less High
Response < 50%	Less High

The following formula is used to find out the increase in students' learning motivation with the guided inquiry learning model using N-Gain:

$$g = \frac{\% < Sf > - \% < Si >}{\% < Smaks > - \% < Si >}$$

Information:
g   = N-Gain Score
%<Sf>   = ScorePosttest
%<Si>   = ScorePretest

[17]

The results of the N-Gain Score obtained are then interpreted according to Table 3:

Table 3. N-Gain Score Interpretation Criteria

Percentage	Criteria
g > 0.7	Tall
0.3 < g < 0.7	Currently
g < 0.3	Low

The research hypothesis testing was carried out using the Wilcoxon test with the help of IMB SPSS 24. The proposed hypothesis is as follows:
H1: There are differences in learning motivation before and after implementing the guided inquiry learning model.

If the significance value is <0.05, then H1 is accepted, which means that the pretest and posttest values have a significant difference.

RESULT AND DISCUSSION

The results received in the form of data before and after measurements are shown in Table 4.

Table 4. Completeness Minimum Criteria

Test type	Score	$\sum$ student	Category
pretest	$\geq$75	0	Complete
	< 75	20	Not Complete
posttest	$\geq$75	11	Complete
	< 75	9	Not Complete

Table 4 shows the number of students with complete and incomplete minimum completeness categories. The pretest scores of all students were incomplete, while the posttest scores were 11 students completed and nine incomplete.

Table 5. Descriptive Statistics Pre Test Post Test

Pretest	N	mean	Std	Min	Max		N	mean
	20	38	Deviation 15,423837	20	70	Pretest	20	38
Post-test	20	77	9.787209699	60	90	Post-test	20	77	0.000

Based on Table 5, the results show that the minimum pretest value is 20 and the maximum pretest value is 70, while the minimum posttest value is 60 and the maximum posttest value is 90. These values are the results before and after applying the guided learning model (Figure 1).

Table 6. Normality test

	Shapiro-Wilk		
	Statistics	df	Sig
Pretest	0.908	20	0.057
Post-Test	0.871	20	0.012

Table 6 shows that the results of the normality test analysis in the pretest meet the requirements for a significant value > 0.05, while the posttest value does not meet the significant requirements of less than 0.05, so it can be said that the normality test analysis is not normally distributed. The t-test could not be performed, so it was replaced with a non-parametric statistical test. The Wilcoxon test is a non-parametric test that is not normally distributed and is used to identify students learning motivation in grades VII-E.

Table 7.Wilcoxon test

Score	mean	Z	df	Sig.(p)
Pretest	38	-3.978	19	0.000
Posttest	77			

Based on the results of the Wilcoxon test in Table 7, it can be explained that the pretest and posttest scores have made progress which can be observed from the positive ranks of data. There are 20 positive data (N) which means that 22 students are motivated. The mean rank or average increase is 10.50, while the positive sum of ranks is 210.00. The Wilcoxon test uses SPSS 24 output. The basis for taking the Wilcoxon test is if the value of Asymp.sig. (2-tailed) is smaller < 0.05, then "Ha is accepted," and if the value of Asymp.sig. (2-tailed) is greater than 0.05, then "Ha is rejected", then do a statistical test.

Based on the calculation results from the statistical test, it can be seen that Asymp.Sig (2-tailed) has a value of 0.000. Because the number 0.000 is smaller than <0.05, it can be defined as "Ha is accepted". It means that there is a comparison of pretest and posttest scores, where the posttest scores have increased. It is also known that the guided inquiry learning model assisted by LKPD has an average motivation of 87.2% with a very high

category, so it is concluded that there is an effect of using the guided inquiry method on learning motivation for class VII-E. Guided inquiry invites active students to carry out investigative activities. These activities make students able to explore new experiences and procedures. Therefore the teaching and learning process makes them enthusiastic.[18].

The following is an N-Gain that is carried out to know the increase in students' learning motivation. The results of N-Gain can be seen in Table 7.

Table 8. N-Gain Results of Each Learner

No	Name	Score		N-Gain	Criteria
		Pre	Post		
1	ARM	50	70	0.4	Currently
2	US	20	70	0.63	Currently
3	FAZ	30	70	0.56	Currently
4	FC	20	70	0.63	Currently
5	KN	30	80	0.71	Tall
6	MAA	40	90	0.83	Tall
7	MAK	60	90	0.75	Tall
8	RRAS	70	80	0.33	Currently
9	RRAS	40	70	0.50	Currently
10	RAR	20	60	0.50	Currently
11	ANA	20	60	0.50	Currently
12	AI	20	80	0.75	Tall
13	CAN	30	70	0.57	Currently
14	FAB	30	90	0.85	Tall
15	LAA	40	80	0.66	Currently
16	NA	50	80	0.60	Currently
17	MRM	50	90	0.80	Tall
18	RMP	60	80	0.50	Currently
19	RSA	30	90	0.85	Tall
20	RGP	50	70	0.40	Currently
Average		38	77	0.616	Currently

Based on Table 7, it is known that the results of the pretest and posttest N-Gain for each student. Average N-Gain with a score of 0.62 moderate criteria. The guided inquiry model can affect the motivation of students. It is because the implementation or steps of guided inquiry learning activities have the power in group discussions. Students are required to interact with each other and play an active role in discussions so that there is a sense of tolerance and responsibility in solving problems given by the teacher.

Motivation is considered to play a role in learning because achievement motivation has the following

meanings: (a) achievement-oriented is understood as behavior that leads to activities that achieve the highest achievement; (b) innovation includes elements of students' desire to find better or better ways; (c) be responsible for yourself in completing tasks including completeness of tasks, be confident and work hard for learning success, (d) ability to predict failure include factors of student sanity, perception risk of failure, and lack of effort, or thoroughness and care in trying to overcome situations that hinder academic achievement [19]. The level of learning motivation is not only influenced by learning difficulties but also influenced by learning styles and environmental factors[20]. Learning styles that are suitable for students will affect students' learning motivation which is increasing because of an increasing urge in students to learn and process subject matter. Family environmental factors also influence student learning motivation. Family factors are the main factors in students' life, growth, and development that affect their learning motivation[21].

CONCLUSION

Based on the results of the research presented above, it can be concluded that the Score increases before and after the use of the guided inquiry method on students' learning motivation. Learning motivation has increased from the average value of 38 to 77 seen from the N-gain Score, which is 0.62 medium criteria. Student responses obtained 87.2% in the very high category.

REFERENCE

[1] Permendikbud. (2016). Permendikbud Nomor 22 Tahun 2016.

[2] Faradilla, M., & Hasan, M. (2018, September). The effectiveness of guided inquiry-based student worksheets on students' generic science skills. In *Journal of Physics: Conference Series* (Vol. 1088, No. 1, p. 012106). IOP Publishing.

[3] Ulfah, A., Bintari, S. H., & Pamelasari, S. D. (2013). Pengembangan LKS IPA berbasis word square model keterpaduan connected. *Unnes Science Education Journal*, 2(2).

[4] Gayatri, I. G. A. S., Jekti, D. S. D., & Jufri, A. W. (2013). Efektifitas pembelajaran berbasis masalah (PBM) dan strategi kooperatif terhadap kemampuan menyelesaikan masalah dan hasil belajar kognitif biologi ditinjau dari kemampuan akademik awal siswa kelas X SMA Negeri 3 Mataram. *Jurnal Pijar Mipa*, 8(2).

[5] Purwati, R., Prayitno, B. A., & Sari, D. P. (2016). Penerapan model pembelajaran inkuiri terbimbing pada materi sistem ekskresi kulit untuk meningkatkan keterampilan proses sains siswa kelas XI SMA. In *Proceeding Biology Education Conference* (Vol. 13, No. 1, pp. 325-329).

[6] Sugiartini, G. A., Dantes, D. N., Candiasa, D. I. M., & Komp, M. I. (2015). Pengaruh Penggunaan Metode Pembelajaran Kontekstual Berbantuan Media Gambar Terhadap Motivasi Dan Hasil Belajar Ipa Pada Siswa Kelas Vi Slb Negeri Gianyar. *Jurnal Penelitian dan Evaluasi Pendidikan Indonesia*, 5(1).

[7] Sya'bania, N., Anwar, M., & Wijaya, M. (2020). Pengembangan Media Pembelajaran Berbasis Video Animasi dengan Model Pembelajaran Inkuiri Terbimbing untuk Meningkatkan Motivasi dan Hasil Belajar Peserta Didik. *Chemistry Education Review (CER)*, 4(2), 34-44.

[8] Srisawasdi, N., & Panjaburee, P. (2019). Implementation of game-transformed inquiry-based learning to promote the understanding of and motivation to learn chemistry. *Journal of Science Education and Technology*, 28(2), 152-164.

[9] Syaefuddin, S., Yuliani, L., & Oktiwanti, L. (2019). Pemberian Kartu Indonesia Pintar (KIP) Dalam Upaya Meningkatkan Motivasi Belajar Bagi Peserta Didik di PKBM GEMA Pada Pendidikan Kesetaraan Program Paket B dan C Kecamatan Tawang Kota Tasikmalaya. *Comm-Edu (Community Education Journal)*, 2(2), 147-152.

[10] Hamdu, G., & Agustina, L. (2011). Pengaruh Motivasi Belajar Siswa Terhadap Pestasi Belajar Ipa Di Sekolah Dasar (Studi Kasus terhadap Siswa Kelas IV SDN Tarumanagara Kecamatan Tawang Kota Tasikmalaya). *penelitian-pendidikan*, 302.

[11] Bayram, Z., Oskay, Ö. Ö., Erdem, E., Özgür, S. D., & Şen, Ş. (2013). Effect of inquiry based learning method on students' motivation. *Procedia-Social and Behavioral Sciences*, 106, 988-996.

[12] Irwan, I., Maridi, M., & Dwiastuti, S. (2019). Developing guided inquiry-based ecosystem module to improve students' critical thinking skills. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 5(1), 51-60.

[13] Yu, Z., Gao, M., & Wang, L. (2021). The effect of educational games on learning outcomes, student motivation, engagement and satisfaction. *Journal of Educational Computing Research*, 59(3), 522-546.

[14] Sugiyono. (2015). Metode Penelitian Pendidikan. Alfabeta.

[15] Majdi, M. K. (2018). Majdi, M. K., & Subali, B. (2018). Peningkatan Komunikasi Ilmiah Siswa SMA melalui Model Quantum learning One Day One Question Berbasis Daily Life Science Question. UPEJ Unnes Physics Education Journal, 7(1), 81–90.

[16] Dhihni, N. E. (2022). Dhihni, N., Erman, & Sari, D. A. P. (2022). Pembelajaran IPA dengan Model Inkuiri pada Masa Pandemi Covid-19. 10(1), 69–74.

[17] Hake, R. R. (1998). Interactive-Engagement Versus Traditional Methods: A Six Thousand Student Survey of Mechanics Test Data For

Introductory Physics Courses. American Journal of Physics, 66(1). 64-74.

[18] Winulang, A. (2015). Pengaruh Disiplin Belajar, Gaya Belajar Dan Lingkungan Keluarga Terhadap Prestasi Belajar Mata Pelajaran Ekonomi Akuntansi Siswa Kelas Xi Ips Sma Solihin Kabupaten Magelang Tahun Ajaran 2013/2014 . Economic Education Analysis Journal, 4(1), 185-193.

[19] Febriani, E. A., Astriani, D., & Qosyim, A. (2022). Penerapan media video animasi untuk meningkatkan motivasi dan hasil belajar siswa materi tekanan zat cair. *PENSA: E-JURNAL PENDIDIKAN SAINS*, *10*(1), 21-25.

[20] Archambault, J., Burch, T., Crofton, M., & McClure, A. (2008). The effect of developing kinematics concepts graphically prior to introducing algebraic problem solving techniques. *Action Research required for the Master of Natural Science degree with concentration in physics*.

[21] Triarisanti, R., & Purnawarman, P. (2019). The influence of interest and motivation on college students'language and art appreciation learning outcomes. *International Journal of Education*, *11*(2), 130-135.