JPPIPA 7(4) (2021)

Jurnal Penelitian Pendidikan IPA

*Journal of Research in Science Education*

http://jppipa.unram.ac.id/index.php/jppipa/index

# Application of the Guided Inquiry Model to Improve Student's Motivation and Creativity

Rahma Dani[1*], Murniati[2], Evendi[3]

[1] Science Education Study Program PPs Syiah Kuala University, Banda Aceh, Indonesia
[2] Study Program of PPs Education Administration, Syiah Kuala University, Banda Aceh, Indonesia
[3] Physics Education Study Program FKIP Syiah Kuala University, Banda Aceh, Indonesia

DOI: 10.29303/jppipa.v7i4.783

**Article Info**
Received: june 5th, 2021
Revised: September 12th, 2021
Accepted: October 9th, 2021

**Abstract:** The application of an attractive learning model is one of the things that affect students' motivation and creativity in learning. The review results so far show that learning activities are still using conventional learning models such as direct learning models. The purpose of this study was to determine the application of the guided inquiry learning model in increasing students' motivation and creativity on temperature and heat material at SMAN 4 Wira Bangsa Aceh Barat. The research method used was pre-experimental with one group pretest-posttest design. The instrument used in the study consisted of a questionnaire. The results showed that applying the guided inquiry learning model could increase students' motivation in the matter of temperature and heat. Increasing students' learning motivation can be seen from the average N-gain value of 0.6, including the medium category. The results of the average difference test obtained a significance value of 0.000 <0.05, meaning that there was a significant difference before and after applying the guided inquiry learning model. Then the results of the analysis of indicators on aspects of attention, relevance, confidence, and satisfaction obtained a score > 80 then included in excellent categories. The application of the guided inquiry learning model can increase students' creativity in the material of temperature and heat. Increasing students' creativity can be obtained an average N-gain value of 0.7, including the high category. The results of the average difference test got a significance value of 0.000 < 0.05, meaning that there was a significant difference before and after applying the guided inquiry learning model. The results of the analysis of indicators through the results of questionnaires and observations consisting of fluency, flexibility, and novelty obtained an average score of > 75, including the high category. The conclusion in this study proves that the guided inquiry model can increase students' motivation and creativity on temperature and temperature heat materials.
**Keywords:** Guided Inquiry Model; Motivation; Student Creativity

**Citation:** Dani, R., Murniati, M., & Evendi, E. (2021). Application of the Guided Inquiry Model to Improve Student's Motivation and Creativity. *Jurnal Penelitian Pendidikan IPA, 7*(4), 642-650. doi:https://doi.org/10.29303/jppipa.v7i4.783

## Introduction

The current learning curriculum is the 2013 curriculum. The learning process in the 2013 curriculum emphasizes the activeness of students learning independently so that students are given the opportunity to build their own knowledge. Suyatmini (2017) said that the implementation of the 2013 curriculum, namely learning, can condition students to achieve or obtain a number of learning experiences in the form of knowledge, skills, social, and basic values reflected in the habits of thinking and acting. Rahmawati (2018) said that the 2013 curriculum is competency and character-based curriculum that aims to improve educational attainment and produce productive, creative, innovative, and effective young generations.

Email: rahma94@mhs.unsyiah.ac.id

In supporting the curriculum in Indonesia in the form of the 2013 curriculum, it is necessary to support creative learning that emphasizes personal experience through the problem-solving process (Dewi et al., 2017). Therefore, curriculum development must be addressed positively as an instrument for forming quality communities informal educational institutions (Sari & Setiawan, 2018). This proves that learning activities that require students' skills and independence in learning are in the form of science learning.

Science is the science of objects and natural phenomena that are obtained from the thoughts and research of scientists carried out with the skills of experimenting using the scientific method. The nature of science is the foundation for studying Natural Sciences (Tursinawati, 2016). Physics as a subject in school is one of the branches of Natural Sciences that can explain various natural phenomena in everyday life. This natural phenomenon can be explained through a concept, theory, and physical law so that it can be accepted by the human mind (Kaniawati, 2017). This science learning needs encouragement or an educator who is able to improve student understanding for the better, namely a professional teacher.

Teachers are one factor that affects the quality of education because quality education is supported by quality teachers (Nahak & Bulu, 2020). Teachers have an important role for students to improve their abilities and skills in any subject area. Yunas & Rachmawati (2018) said that teachers who can teach according to their personal character to help students learn are teachers who have achieved teaching goals. If the teaching objectives have been achieved, the teacher's next step is to examine the application of the curriculum related to teaching materials, the role of the teacher, the role of students, learning resources, and the learning process as well as the psychological application related to the learning theory used, teacher and student motivation, classroom management, and evaluation of learning outcomes. Teaching abilities that are in accordance with the teacher's personality will positively influence the needs of students in learning so that students become motivated. Therefore, one of the students' motivations is to learn physics.

The development of physics is very influential for technological progress because physics is the basic science needed by other branches of science. In the field of education, to keep pace with technological developments, changes are made in physics learning (Wahyuni, 2015). This requires a way by educators to improve students' ability to understand the theories in physics lessons. Arista & Kuswanto (2018) said that understanding concepts are the most important part of learning physics, so the concepts in physics are in the form of laws, theories, and how to apply them. This phenomenon requires a learning model that can motivate and increase students' creativity in learning.

Effective learning activities, then a learning model that is able to increase student learning motivation is applied. one of the learning models that can increase students' motivation and creativity in learning is a guided inquiry learning model. Ichsan et al. (2019) say that simply the learning model consists of certain phases or syntax that can direct students to learn to achieve learning objectives. Therefore, one of the learning models that can achieve student learning objectives is inquiry learning.

This is in accordance with the opinion of Sitorus et al. (2017) that the inquiry learning model can motivate and encourage students to be active in exploring and mastering the subject matter itself. Inquiry-based science learning has been shown to have the potential to increase student involvement in science at all levels as well as competency development (Boaventura & Faria, 2015).

The guided inquiry learning model is a learning model that emphasizes the process of finding concepts and relationships between concepts, where students design their own experimental procedures so that the student's role is more dominant, while the teacher only guides students in the right direction (Laila & Lufri, 2019). Inquiry learning is able to instruct an active learning process that reflects a scientific approach in investigating and investigating science learning (Dostal, 2015). This proves that the application of the guided inquiry learning model can increase student learning independence so that students are motivated and have creativity in solving a problem in an experiment.

The results of previous observations and interviews at SMAN 4 Wira Bangsa Aceh Barat show that the use of learning applications so far rarely forms a study group. However, learning activities are carried out with direct learning, so students are only able to listen to the teacher's explanation. The role of students in learning activities has not been realized directly, but the teacher is the main foundation in the learning process. The teacher also said that it was difficult to find a suitable learning model for the material being taught to students, such as static fluid material, dynamic fluid, temperature, heat, and heat transfer. Based on the results of the interviews, students were only explained in general through power points and videos. In addition, students at the school said that they still did not understand the importance of studying physics.

The problems faced by students in improving learning abilities and the way teachers develop these learnings, we need a learning model that can directly motivate and increase students' creativity. One of the

learning models that can increase students' motivation and creativity is a guided inquiry learning model. This is in accordance with Yanti et al.'s (2016) research that the guided inquiry model can improve students' creative thinking skills and learning motivation. Riswanto & Aryani (2017) say that motivation is an internal process that is one of the main factors determining the success rate of student learning. This proves that in the learning process, it is necessary to increase student learning motivation.

Learning motivation is defined as an internal factor with four components, namely the opportunity to achieve success, concerns about failure, interests, and challenges (Ilyas et al., 2020). Learning motivation consists of intrinsic and extrinsic motivation. Intrinsic motivation can be interpreted as a motivation that arises due to the pleasure of the task being carried out, while extrinsic motivation is related to external benefits or rewards and is associated with the achievement of a goal (Amirkhanova et al., 2016). Learning motivation is essential for the realization of learning achievement (Asvio et al., 2017).

In addition, the guided inquiry model can increase student learning creativity because students can think about something new so they can solve problems and develop students' own concepts or ideas (Zulvawati, 2019). Saputri et al. (2019) said that the inquiry model is appropriate for training students' critical and creative thinking skills. Vejian et al. (2016) said that creativity is seen as an important factor in schools to further develop creativity, especially in school management and the teaching and learning process in the classroom. Tsaniyah & Poedjiastoeti (2017) say that creativity can be divided into three dimensions, namely fluency, flexibility, and originality.

## Method

The method used in this study is a pre-experimental method with a one-group pretest-posttest design. The design of this research can be seen in Table 1.

**Table 1.** Research Design

| Class | *Pretest* | Treatment | *Posttest* |
|---|---|---|---|
| Experiment | $O_1$ | X | $O_2$ |

(Sugiyono, 2018)

Descriptions:
$O_1$ = *Pretest*
X = Treatment
$O_2$ = *posttest*

The population in this study were all students of class XI SMA Negeri 4 Wira Bangsa Aceh Barat, totaling 75 students from 3 classes. The technique of determining the research sample using the purposive sampling technique. Sampling was carried out based on the consideration of the physics teacher concerned on the basis of students' abilities. The sample in this study was the students of class XI MIA2, totaling 25 students.

The instruments in this study were questionnaires and observation sheets to determine students' motivation and creativity. The data collection procedure begins with giving pretest questionnaires to students. Then after the students filled out the questionnaire, the next step was the teacher implementing learning activities through a guided inquiry learning model and observing students' creativity. After the learning activities have been carried out well, the final stage is distributing posttest questionnaires. Data analysis techniques in this study used the N-gain equation and hypothesis testing (Paired Sample t-test).

## Result and Discussion

Learning motivation is an impulse in students that causes learning activities, ensures continuity, and provides direction to learning activities so that the desired goals can be achieved and the results obtained are also optimal. Motivation in this study is measured in four aspects proposed by Keller (2016), namely attention, relevance, confidence, and satisfaction (ARCS). Student learning motivation was measured using a questionnaire.

The increase in students' learning motivation was analyzed through the average difference test on the pretest and posttest. The test results use the paired sample t-test with the help of SPSS. This test aims to determine whether there is a difference in the average of two paired samples so that the sample in question is the same sample but has two data, namely pretest and posttest. The paired sample t-test is part of the parametric statistical test used to find out normally distributed data. The results of data normality testing using SPSS can be briefly seen in table 2.

**Table 2.** Test the normality of the pretest and posttest data on students' learning motivation

| Class | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | Df | Sig. | Statistic | Df | Sig. |
| Pretest | 0.166 | 25 | 0.074 | 0.939 | 25 | 0.140 |
| Posttest | 0.135 | 25 | 0.200 | 0.926 | 25 | 0.069 |

Table 2 shows the results of the Kolmogorov Smirnov and Shapiro-Wilk normality tests on the pretest and posttest data. Based on the test results, it is known that the significance value (Sig) for all data, both on the Kolmogorov Smirnov and Shapiro-Wilk tests >

0.05, it can be concluded that the research data is normally distributed. After knowing the normality test results for normally distributed data, the next step is to test the average difference between the two data. The results of the average difference test used the paired sample t-test. The test results can be seen in Table 3.

**Table 3.** The results of the two different tests on the average student learning motivation

| Data | N | U (significance value) | Uα (U table) | Description |
|---|---|---|---|---|
| Pretest<br>Posttest | 25<br>25 | 0.000 | 0.05 | Ha accepted |

Table 3 shows a significance value (sig) of 0.000 <0.05, and it can be concluded that Ha is accepted. It means that there is a significant difference between the pretest and the posttest. The test results prove that after applying the guided inquiry learning model, there are significant differences, so it can be concluded that the implementation of the guided inquiry learning model can increase students' learning motivation. This is in line with research conducted by Rahmani et al. (2015) that there is a significant difference in students' learning motivation before and after the application of the guided inquiry learning model because the implementation of the guided inquiry learning model is very effective in increasing students' learning motivation.

Indicators of student learning motivation consist of attention, relevance, confidence, and satisfaction. To find out the results of increasing students' learning motivation in each indicator before and after applying the guided inquiry learning model, it was analyzed using SPSS. Briefly, it can be seen in table 4.

**Table 4.** Results of Analysis of Student Learning Motivation Indicators

| No | Indicator | Pretest | Category | Posttest | Category | N-gain | Category |
|---|---|---|---|---|---|---|---|
| 1 | Attention | 58.00 | enough | 85.00 | very good | 0.6 | medium |
| 2 | Relevance | 57.00 | enough | 86.00 | Very good | 0.7 | high |
| 3 | Confidence | 60.00 | enough | 81.00 | good | 0.5 | medium |
| 4 | Satisfaction | 61.00 | enough | 84.00 | Very good | 0.6 | medium |

Table 4 shows the results of the analysis of student learning motivation indicators before and after applying the guided inquiry learning model. The results of students' learning motivation in the pretest were in the fairly good category and the posttest in the good and very good categories. In comparison, the results of the analysis of N-gain indicators are in the medium and high categories. Based on the previous analysis results, it can be concluded that students' learning motivation after applying the guided inquiry learning model in every aspect has increased. This is in accordance with research conducted by Sukma et al. (2016) that guided inquiry learning is able to develop students' desire and motivation to learn the principles and concepts of physics.

With the student's learning motivation which consists of aspects of ACRS, students will be encouraged to study harder because they feel that what they learn is meaningful to them. Taqfiq et al. (2018) say that the inquiry learning model emphasizes the process of thinking critically and analytically to seek and find the answer to a problem in question. Based on the results of data analysis, the indicator of student learning motivation can be seen in Figure 1.

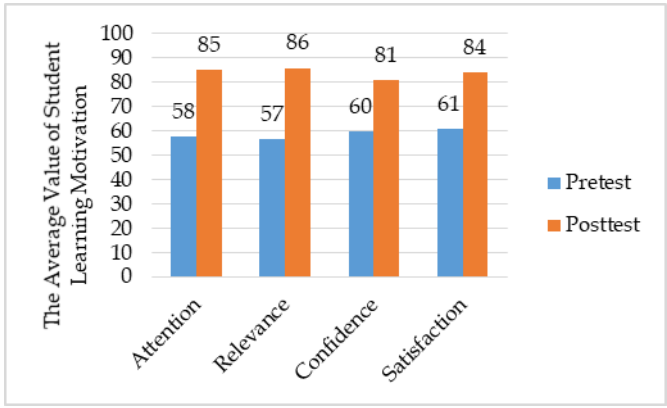


**Figure 1.** Average Result of Student Learning Motivation Indicator

Figure 1 shows the results of the analysis of student motivation before and after applying the guided inquiry learning model. Based on the results of data analysis, the average student, after applying the guided inquiry learning model, increases student learning motivation, which is better in physics lessons, especially temperature and heat material. After applying the inquiry learning model, the average results of the indicators are in the good and very good categories. The cause of the increase in student learning motivation in the experimental class is because this inquiry model is able to orient students in the learning

process, so that students begin to solve learning problems.

At this stage, students pay attention to the learning process and seek and find information related to the material discussed, namely temperature and heat. Students begin to formulate problems and hypotheses that will be tested to find a real concept. In this case, students are able to relate concepts from the material and mention the application of physics concepts in everyday life.

Students' learning motivation can be seen from the ability of students to design experiments, conduct experiments, communicate experimental results and conclude. At this stage, students dare to express opinions or answer questions. Then solve problems related to physics material independently. Furthermore, students also try to be active in physics learning activities to complete tasks, projects, practice questions, and physics test questions. This proves that the application of this guided inquiry model is able to increase student learning motivation better than before.

Based on the results of data analysis, it can be concluded that the application of the guided inquiry learning model can increase students' learning motivation. Increasing students' learning motivation can be seen from the aspects of attention, relevance, confidence, and satisfaction. The results obtained from the four aspects > 80 are categorized as good and very good.

This is in accordance with research conducted by Merta (2021) that the guided inquiry learning model plays an important role in increasing learning motivation. It always involves all students directly discovering what they are learning so that they practice developing curiosity and creativity, honesty, and skills. Critical thinking can later be used to solve the problems they face. The difference between this research and this research is on a different concept or material. This study has an advantage because guided inquiry learning is emphasized not only on teacher explanations, but students are able to complete the Student Worksheets that have been distributed.

Creativity is a person's ability to give birth to something new based on the information obtained so as to produce new solutions or new ideas. Creativity is also freely given to students to give birth to ideas, problems, and discoveries from the learning activities carried out. The creativity measured consists of three indicators proposed by Jagom (2015), including; fluency, flexibility, and novelty. It is collecting data to determine the creativity of students in this study using questionnaires and observation sheets. The average test results of student creativity before and after applying the guided research learning model can be known using a sample analysis paired with t-tests. Before carrying out the paired sample t-test, the data normality test was carried out first. The results of data normality testing using SPSS can be briefly seen in table 5.

**Table 5.** Normality test of students' creativity pretest and posttest data

| No | Class | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | Df | Sig. | Statistic | df | Sig. |
| 1 | Pretest | 0.161 | 25 | 0.094 | 0.941 | 25 | 0.159 |
| 2 | Posttest | 0.130 | 25 | 0.200 | 0.952 | 25 | 0.280 |

Table 5 shows the results of the students' creativity normality test analysis using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The results of the analysis prove that the pretest and posttest data of students' creativity > 0.05, meaning that both data are normally distributed. The results of the average difference test were analyzed using SPSS so that it can be briefly seen in table 6.

**Table 6.** The results of the two different tests on the average creativity of students

| Data | N | U (significance value) | Uα (U table) | Description |
|---|---|---|---|---|
| Pretest<br>Posttest | 25<br>25 | 0.000 | 0.05 | Ha accepted |

Table 6. shows the results of the analysis of the two mean difference tests on the pretest and posttest data or before and after applying the guided inquiry learning model on the material of temperature and heat. The results of the analysis obtained a significance value of 0.000 <0.05, then Ha is accepted, meaning that there is a significant difference in student creativity before and after applying the guided inquiry learning model. This is in line with research conducted by Sukma et al. (2016) that guided inquiry learning is able to develop students' desire and motivation to learn the principles and concepts of physics, but the difference is the different concepts and the making of Student Worksheets which are much more interesting. With student learning motivation, students will be encouraged to study harder because they feel that what they learn is meaningful to them.

In line with research conducted by Doyan et al. (2021), the guided inquiry learning model is a learning model designed to teach concepts and the relationship between material concepts so that students have creativity and problem-solving skills. Susilawatii et al. (2021) also said that the guided inquiry learning model is a learning model that places students as learning subjects.

The results of the indicator analysis show that the guided inquiry model can increase creativity, so the results obtained on average are in the high category. The results of the analysis can briefly be seen in table 7.

**Table 7.** Results of Student Creativity Analysis Indicators

| No | Indikator | Pretest | Category | Posttest | Category | N-gain | Category |
|---|---|---|---|---|---|---|---|
| 1 | Fluency | 59 | medium | 88 | high | 0.7 | high |
| 2 | Flexibility | 59 | medium | 88 | high | 0.7 | high |
| 3 | Novely | 60 | medium | 87 | high | 0.7 | high |

Table 7 shows the results of the pretest, posttest, and N-gain analysis of student creativity indicators. The results of the pretest analysis of students' creativity obtained an average score on the indicators of fluency, flexibility, and novelty between 50-74, including the medium category. After applying the guided inquiry learning model of student creativity on each indicator, an average value of > 75 in the high category was obtained, then the results of an average N-gain increase of 0.7 were included in the high category. The results of the analysis of student creativity based on indicators can be seen in more detail in Figure 2.

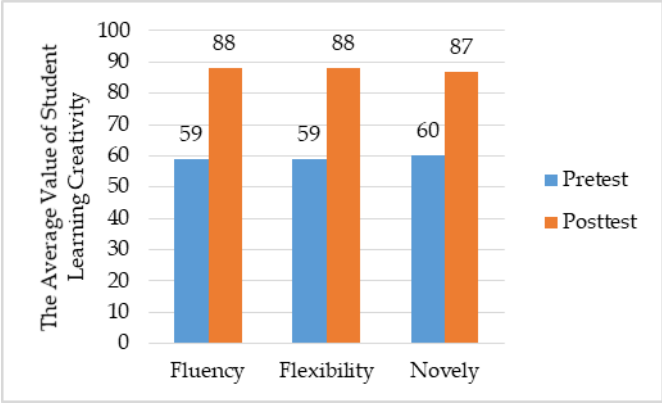


**Figure 2.** The Average Results of Student Creativity Indicator

Figure 2. shows that the results of the analysis of student creativity indicators after applying the guided inquiry learning model obtained an average of > 75, so it is included in the high category. The results obtained prove that the creativity of students after applying the guided inquiry learning model is better than before applying the guided inquiry learning model. This is in accordance with research conducted by Aribawati et al. (2018) that changes in the level of student learning creativity can be seen, which initially only referred to the material presented by the teacher and learning through Student Worksheets and available textbooks can be even better with joint discussion activities to solve learning problems through direct observation activities with direction and guidance from the teacher.

One of them is through the application of a guided inquiry model. This is in line with the opinion expressed by Komalasari et al. (2019) that the guided inquiry learning model is a student-centered learning model where in the learning process, students are required to be active in learning, but in the process, the teacher does not let go of the activities of the participants. Students are in the learning process, but the teacher provides guidance.

Analysis of student creativity through observations on the three indicators, namely fluency, flexibility, and novelty, can be seen in Figure 3.

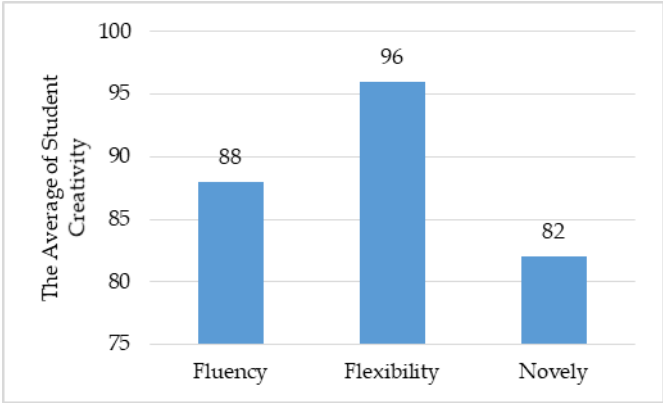


**Figure 3.** The average results of student creativity indicators through observation

Figure 3 shows the results of the analysis of student creativity indicators through observation. The results of the average student creativity observed by observers obtained an average score of student creativity > 75, including the high category. After applying the guided inquiry learning model, increasing students' creativity on fluency indicators obtained an average score of 88 high categories. Student creativity in fluency indicators increases because students are able to generate ideas and provide answers to problems given by the teacher so that they can be solved

Student creativity on the flexibility indicator obtained an average score of 96, including the high category. The increase in student creativity on the flexibility indicator is because students have the ability to provide answers by changing the way of completion from one way to another in responding to commands, by presenting a concept of completion in different ways. After applying the guided inquiry learning model, increasing students' creativity in the novelty indicator obtained an average score of 82, including the high category. The increase in students' creativity in the novelty indicator can be seen from the ability of students to answer problems by designing new and different or "unusual" techniques used by students at their level of knowledge.

## Conclusion

The application of the guided inquiry learning model can increase students' motivation on the material of temperature and heat. Increasing students' learning motivation can be seen from the average N-gain value of 0.6, including the medium category. The results of the average difference test obtained a significance value of 0.000 <0.05, meaning that there was a significant difference before and after applying the guided inquiry learning model. Then the results of the analysis of indicators on the aspects of attention, relevance, confidence, and satisfaction obtained a score > 80 then included in the good and very good categories. The application of the guided inquiry learning model can increase students' creativity in the material of temperature and heat. Increasing students' creativity can be obtained with an average N-gain value of 0.7, including the high category. The results of the average difference test obtained a significance value of 0.000 <0.05, meaning that there was a significant difference before and after applying the guided inquiry learning model. The results of the analysis of indicators through the results of questionnaires and observations consisting of fluency, flexibility, and novelty obtained an average score of >75, including the high category.

## Acknowledgments

Thank you to the leadership and teaching staff at SMAN 4 Wira Bangsa, who provided service facilities during the research. Thank you to the supervisor who has guided me in completing this article.

## References

Amirkhanova, K., Ageeva, A., & Fakhretdinov, R. (2016). Enhancing Students' Learning Motivation through Reflective Journal Writing. *The European Proceedings of Social & Behavioural Science EpSBS*, 14–18. https://doi.org/10.15405/epsbs.2016.07.3

Aribawati, D., Kristin, F., & Anugraheni, I. (2018). Penerapan Model Pembelajaran Inkuiri Terbimbing Untuk Meningkatkan Kreativitas dan Hasil Belajar IPA Siswa Kelas 3 SD. *Jurnal Sains dan Teknologi,* 1(1):70-75. doi: https://doi.org/10.31764/justek.v1i1.407. [Indonesian]

Arista, S.F. & Kuswanto, H. (2018). Virtual physics laboratory application based on the android smartphone to improve learning independence and conceptual understanding. *International Journal of Instruction,* 11(1):1-16. Retrieved from https://eric.ed.gov/?id=EJ1165233.

Asvio, N., Arpinus. & Suharmon. (2017). The influence of learning motivation and learning environment on undergraduate students' learning achievement of management of Islamic education, study program of lain Batusangkar in 2016. *Noble International Journal of Social Sciences Research,* 2(2):16-31. Retrieved from https://ideas.repec.org/a/nap/nijssr/2017p16-31.html.

Boaventura, D. & Faria, C. (2015). Science inquiry-based activities in elementary education: how to support teachers' pratices?. *International Journal of Information Technology,* 5(6):451-455. Retrieved from http://www.ijiet.org/show-55-612-1.html.

Dewi, N.I., Poedjiastoeti, S., & Prahani, K.B. (2017). Elsii learning model based local wisdom to improve students' problem solving skills and scientific communication. *International Journal of Education and Research,* 5(1):107-118. Retrieved from https://www.ijern.com/

Dostál, J. (2015). The definition of the term "Inquiry-based instruction." *International Journal of Instruction*, *8*, 69–82. https://doi.org/10.12973/iji.2015.826a

Doyan, A., Susilawati, S., & Hardiyansyah, H. (2020). Development of Natural Science Learning Tools with Guided Inquiry Model Assisted by Real Media to Improve Students' Scientific Creativity and Science Process Skills. *Jurnal Penelitian Pendidikan IPA, 7*(1), 15-20. doi:https://doi.org/10.29303/jppipa.v7i1.485

Ichsan, Z.I., Sigit, V.D., & Miarsyah, M. (2019). Students' hinger order thinking skills in environmental learning: develop assessment based on green consumerism. *Journal of Educational Science and Technology,* 5(1). 9-19. doi: https://doi.org/10.26858/est.v5i1.7848.

Ilyas, I., & Liu, A. (2020). The Effect of Based E-learning Contextual Approach on Student Learning Motivation. *Jurnal Penelitian Pendidikan IPA, 6*(2),

184-189. doi:https://doi.org/10.29303/jppipa.v6i2.425

Jagom, Y. O. (2015). Kreativitas siswa SMP dalam Menyelesaikan Masalah Geometri Berdasarkan Gaya Belajar Visual-Spatial dan Auditory-Sequential. *Math Didactic: Jurnal Pendidikan Matematika*, *1*(3), 176-190. https://doi.org/10.33654/math.v1i3.18. [Indonesian]

Karniawati, I. (2017). Pengaruh simulasi computer terhadap peningkatan penguasaan konsep impuls-momentum siswa SMA. *Jurnal Pembelajaran Sains,* 1(1). 24-26. doi: http://dx.doi.org/10.17977/um033v1i1p24-26. [Indonesian]

Keller, J. (2016). Motivation, Learning, and Technology: Applying the ARCS-V Motivation Model. *Participatory Educational Research*, *3*, 1–15. https://doi.org/10.17275/per.16.06.3.2

Komalasari, B., Jufri, A., & Santoso, D. (2019). Pengembangan Bahan Ajar IPA Berbasis Inkuiri Terbimbing untuk Meningkatkan Literasi Sains. *Jurnal Penelitian Pendidikan IPA, 5*(2), 219-227. doi:https://doi.org/10.29303/jppipa.v5i2.279 [Indonesian]

Laila, N., & Lufri. (2019). The influence of guided inquiry learning model with LKPD assistance on attitude competencies of class XI students of SMAN 1 Sungayang. *International Journal of Progressive Sciences and Technologis (IJPSAT),* 15(2). 171-175. doi: http://dx.doi.org/10.52155/ijpsat.v15.2.1121.

Merta, M.L. (2021). Peningkatan Motivasi Belajar dan Penguasaan Konsep Kimia Pada Topik Hidrolisis Garam dan Larutan Penyangga Melalui Pembelajaran Inkuiri Terbimbing. *Jurnal Pendidikan dan Pembelajaran Sains,* 4(1):1-12. doi: http://dx.doi.org/10.23887/jppsi.v4i1.30048 [Indonesian]

Nahak, R., & Bulu, V. (2020). Efektivitas Model Pembelajaran Inkuiri Terbimbing Berbantu Lembar Kerja Siswa Berbasis Saintifik Terhadap Hasil Belajar Siswa. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran, 6*(2), 230-237. doi:https://doi.org/10.33394/jk.v6i2.2369. [Indonesian]

Rahmani, Halim, A., & Jalil, Z. (2015). Penerapan Model Pembelajaran Inkuiri Terbimbing Untuk Meningkatkan Keterampilan Proses Sains Dan Motivasi Belajar Siswa Sekolah Dasar. *Jurnal Pendidikan Sains Indonesia,* 3(1):158-168. Retrieved from: http://jurnal.unsyiah.ac.id/JPSI/article/view/7661. [Indonesian]

Rahmawati, N.A. (2018). Identifikasi masalah yang dihadapi guru dalam penerapan kurikulum 2013 revisi di SD. *Indonesian Journal of Primary Education,* 2(1). 114-123. doi: https://doi.org/10.17509/ijpe.v2i1.14227. [Indonesian]

Riswanto, A., & Aryani, S. (2017). Learning motivation and student achievement: description analysis and relationships both. *COUNS-EDU: The International Journal of Counseling and Education,* 2(1), 42-47. doi: http://dx.doi.org/10.23916/002017026010

Saputri, C.A., Sajidan, Rinanto, Y., Alfandi, & Prasetyanti, M.N. (2019). Improving students's critical thinking skills in cell-metabolism learning using stimulating hinger order thinking skills model. *International Journal of Intruction,* 12(1):327-242. Retrieved from https://eric.ed.gov/?id=EJ1201357.

Sari, P.A., & Setiawan, A. (2018). The development of internet-based economic learning media using moodle approach. *International Journal of active learning,* 3(2):100-109. Retrieved from https://journal.unnes.ac.id/nju/index.php/ijal/article/view/13449.

Sitorus, H.H., Hasruddin, & Edi,S. (2017). The influence of inquiry learning model on students's scientific attudes in ecosystem topic at MTs. Darul Hikmah Sei Alim (Islamic junior school) Asahan. *International Journal of Humanities Social Sciences and Education (IJHSSE),* 4(2):170-175. Retrieved from: https://www.arcjournals.org/.../volume-4-issue-11/20

Sugiyono. (2018). *Metode penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta. [Indonesian]

Sukma, Komariah, L., & Syam, M. (2016). Pengaruh Model Inkuiri Tebimbing *(Guided Inquiry)* Dan Motivasi Terhadap Hasil Belajar Fisika Siswa. *Jurnal Saintifika,* 18(1). 59-63. Retrieved from: https://jurnal.unej.ac.id/index.php/STF/article/view/3185 [Indonesian]

Susilawati, S., Doyan, A., Artayasa, P., Soeprianto, H., & Harjono, A. (2020). Analysis of Validation Development Science Learning Tools using Guided Inquiry Model Assisted by Real Media to Improve the Understanding Concepts and Science Process Skills of Students. *Jurnal Penelitian Pendidikan IPA, 7*(1), 41-44. doi: https://doi.org/10.29303/jppipa.v7i1.473

Suyatmini. (2017). Implementasi kurikulum 2013 pada pelaksanaan pembelajaran akutansi di sekolah menengah kejuruan. *Jurnal Pendidikan Ilmu Sosial,* 27(1). 60-68. doi: 10.2317/jpis.v27i1.5120. [Indonesian]

Taqfiq, M., Setiadi, D., & Hadiprayitno, G. (2018). Implementasi Model Pembelajaran Inkuiri Dan Problem Based Learning (PBL) Terhadap Keterampilan Generik Sains Biologi Ditinjau Dari Kemampuan Akademik Siswa. *Jurnal Penelitian Pendidikan IPA (JPIPA),* 4(2). 29-33. doi:https://doi.org/10.29303/jppipa.v4i2.114

Tsaniyah, B.A., & Poedjiastoeti, S. (2017). Moge learning model to improve creative thinking skills. *International Journal of Education and Research,* 5(1). 165-172. Retrieved from: https://www.ijern.com

Tursinawati. (2016). Penguasaan Konsep Hakikat Sains Dalam Pelaksanaan Percobaan Pada Pembelajaran IPA di SDN Kota Banda Aceh. *Jurnal Pesona Dasar,* 2(4):72-84. Retrieved from http://jurnal.unsyiah.ac.id/PEAR/article/view/7534. [Indonesian]

Vejian, G., Kamarudin, N., & Kadir, A.S. (2016). School creative climate: factors influence fostering creativity school. *International Journal of Education and Training (InjET),* 2(1):1-5. Retrieved from http://www.injet.upm.edu.my/index.php/component/users/?view=reset.

Wahyuni, L., Andani, M., Afriyani, Y., & Andini, C. (2017). Analisis motivasi belajar pada siswa kelas XI MIA 4 SMA Negeri 3 Kota Jambi pada mata pelajaran fisika. *Gravity: Jurnal Ilmiah Penelitian dan Pembelajaran Fisika,* 3(1):90-99. doi: http://dx.doi.org/10.30870/gravity.v3i1.2415. [Indonesian]

Yanti, S.N., Yusrizal, & Gani, A. (2016). Penerapan model pembelajaran inkuiri terbimbing untuk meningkatkan keterampilan berpikir kreatif dan motivasi siswa ditinjau dari jenis kelamin pada materi kalor kelas X SMAN II Banda Aceh. *Jurnal Pendidikan Sains Indonesia,* 4(1):1-12. Retrieved from http://jurnal.unsyiah.ac.id/JPSI/article/view/6405. [Indonesian]

Yunus, B.T., & Rachmawati, A.M. (2018). Kemampuan Mengajar Guru Dan Motivasi Belajar Fisika Pada Siswa di Yogyakarta. *PSYCHOPOLYTAN (Jurnal Psikologi),* 1(2):60-75. Retrieved from http://jurnal.univrab.ac.id/index.php/psi/article/view/448/307. [Indonesian]

Zulvawati, A., Isnaini, M., & Imtihana, A. ( ). Penerapan Model Pembelajaran Inkuiri dalam Meningkatkan Kreativitas Belajar Siswa Pada Mata Pelajaran Al-Islam di SMP Muhammadiyah 4 Palembang. *Jurnal PAI Raden Fatah*, *1*(1), 62-67. https://doi.org/https://doi.org/10.19109/pairf.v1i1.3011. [Indonesian]