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Junior High School Students' Interest in Science Learning: A Case Study

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ABSTRACT

This research aims to analyze students' interest in learning science. The method used is a survey. Data collection techniques used interest questionnaires and interviews. The research was conducted on 409 junior high school students in Bandung, Indonesia, consisting of 201 male students and 208 female students. The research results show that students' interest in learning science is in the good enough level interest category. This research also identified factors that can influence students' interest in learning science in sequence. Five factors include teacher, family, informal learning experiences, learning experiences in the classroom, and friends. Analysis of students' interests based on gender was carried out using the Kruskall-Wallis Test. There is a difference in the average score of students between men and women, which shows that female student's interest in learning is higher. Based on student's responses to open questions and interviews, information was obtained that the reason they were interested in science was that science was material that had many practicum concepts that could be carried out, exciting learning activities, and support from parents at home. Meanwhile, the most dominant reasons they are not interested in science are the physics material, which contains a lot of calculations and the science teachers are not interesting.

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1. INTRODUCTION

Natural science (science) is a subject that is closely related to the natural environment and human survival, so science subjects need to be given at all levels of education, from elementary to senior level, even up to university. Science also plays a role in the educational process and technological development. Science has a very important role in the rapid progress of science and technology. Science subjects include subjects from the scope of biology, physics, and chemistry. Science cannot be separated from simple experiments or practical work in the laboratory, so science learning should not only be done conceptually in the classroom. Still, it must also provide real experience for students studying science. When science is taught as a real experience, science will become the main domain that can attract and raise student's interest in science learning.

Interest in learning is a tendency that a person has in the learning process regularly, with feelings of joy and interest without any coercion by other people (Rojabiyah & Setiawan, 2019). Interest in learning is the most important factor to stimulate student involvement in learning. Meanwhile, students often have problems with their interest in learning science for various reasons, such as difficult calculation material, lack of practicum implementation, boring learning, etc. Individual interest in science lessons at school can be defined as a relatively stable and long-lasting personal emotion consisting of affective and behavioral reactions to events in the school environment. Interest in learning has an important role in learning. If students feel interested, they will feel happy about learning science at school. They will easily understand the learning experiences provided in science lessons and give full attention to the assignments the science teacher gives (Cheung, 2018). Internal factors and external factors can influence interest. This research will measure five factors: family, peers, teachers, science learning in the classroom, and informal science learning (Lamb *et al*., 2012). There has been a lot of research on the influence of a variable on a student's interest. However, very limited research still measures students' interests and factors influencing their interest in learning science.

Five factors will be identified in this research. The first factor is family influence (F); if parents help guide their children by discussing science activities at school, they will be enthusiastic about studying science. Peers (P) can influence a person's interest in learning science; if students have friends who like science, they will be encouraged to do so. The new learning paradigm has changed teacher-centered habits to student-centered, so teachers must encourage students to be actively involved in the science learning process to make them interested in the topic of discussion. Students need to feel encouraged to do something in the learning activity, to explore and ask questions, which can help develop an interest in science. While formal classroom (CR) education emphasizes science as knowledge, informal education integrates economic and social issues with science as its method. Informal learning (I) is any learning that occurs outside the formal structure of the classroom, for example, visits to museums, walking in the forest, watching science shows on social media, and anywhere where there is an opportunity to learn about science through real experience (Lamb *et al*., 2012). Lastly, science learning at school is about learning patterns in the classroom. Science learning in schools must make students understand science as content and as a normative practice that connects science and life (Anderhag *et al*., 2015).

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2. LITERATURE REVIEW

There is some research about students' interests in science courses. One of them conducted by Cheung (2018), his study determined factors influencing individual interest in science at school are science self-concept, followed by individual interest in science and situational influences in science lessons. This research states that teachers must pay special attention to the relationship between academic self-concept and interest if they want to increase students' interest in learning science at school. van Griethuijsen *et al*. (2015) report students from countries outside Western Europe have a greater interest in school science than students in Western Europe. Students with a high interest in school science are also usually more interested in careers in science and science-related extracurricular activities. This research examines students' interest in science learning at school and jobs or careers in science. The results of his research stated that students interested in science learning would make them feel interested in working in a science career. Riwahyudin's (2015) study determined the attitude of each student's success with the material absorbed optimally in the learning process. Students' success in understanding the teaching material presented by the teacher in the learning process leads to positive science learning outcomes for individual students. Conversely, student's failure to understand the material causes low learning outcomes in science subjects.

Similar research was also conducted by Andira *et al*. (2022); its results are; that indicators influencing students' interest in learning include joy, attention, interest, and involvement. Interest in learning has a positive effect on learning outcomes. Students' interest in learning influences students' responses to the lesson material presented, especially science learning. Thus, students with a high interest in learning will not have difficulty doing the assignments or questions. High interest in learning will produce good results (Andira *et al*., 2022).

Research regarding interests has also been carried out in science learning in the chemistry and physics groups. Hamdi and Cut Kurniyawati Rahim also observed an analysis of students' interests with the research title Analysis of Student's Learning Interests in Physics Subjects at SMA N 1 Sakti. Several factors influence students' interest in learning physics, including encouragement from students, teachers, parents, and friends to support the smooth running of teaching and learning activities. If sufficient encouragement from teachers, parents, and friends is fulfilled, it will increase student interest. Encouragement from within students greatly influences students' interest in learning. This encouragement from within students is in the form of the student's desire to learn. An educator's encouragement can arouse student interest by providing interesting strategies and methods in teaching and learning activities (Kurniawati Rahim, 2020).

Research on student interest has been widely carried out in research that observes the influence or relationship of a variable on student interest. The research entitled The Relationship Between Learning Interest and Study Habits on the Chemistry Learning Outcomes of Class reveals that if students' interest in learning and learning habits increase, then student's learning outcomes will also increase. However, few studies in Indonesia have conducted survey research to measure students' interest in science learning. In 2023, namely observing the interest of junior high school students in online learning and the factors that influence it (Putra *et al*., 2023). However, this research was conducted for online learning, and some factors have not been researched, namely regarding students' learning experiences. Another research was conducted by Atikah Dwi, etc., who observed students' interest in learning science in class (Anggita *et al*., 2023). However, this research was

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conducted at the elementary school level and has not looked further into the factors that can influence student interest. The novelty of this research is analyzing the interest of junior high school students in science learning and identifying one of the factors that most strongly influences interest from the five factors that will be measured. Apart from that, an analysis of the interests of junior high school students was also carried out based on gender differences.

This research was based on theory from research regarding the development and validation of interest instruments in science conducted. Measuring student's interest significantly must be done accurately by observing the factors involved. can influence his interest in studying science. The Science Interest Survey is a scale validated to assess a person's interest in science using five factors: family, peers, teachers, science learning in class, and informal science learning.

This research aims to analyze students' interest in science learning based on gender and identify one of the strongest factors that influences students' interest in science. It is hoped that the benefits of the results of this research can provide initial knowledge regarding students' interest in science learning. Thus, the results of this research can also become a basis for teachers to develop learning plans that can increase students' interest in learning. Apart from that, this research will also discuss factors influencing student interest in learning. This will provide insight into the world of education in terms of preparing and considering more diverse strategies (by paying attention to five factors) to stimulate students' interest.

This research focuses on the interest of each student in learning science. I want to explore it further to find out the factors that play a role in influencing student's interest in learning science. This study aims to answer the following two research questions:

(i) What is the situation of junior high school student's interest in science learning?
(ii) What factors most strongly influence student's interest in science learning?
(iii) Are there differences in interest situations between male and female students?

3. METHODS

3.1. Research Design

This research uses quantitative research methods, such as a survey. Few researchers use methodologies other than questionnaires when investigating students' interests, motivations, or attitudes toward science and technology. This research uses an interest questionnaire survey and interviews. The questionnaire survey was conducted by researchers on 409 junior high school students and took approximately 10 minutes to answer all interest indicator items. Names of students and schools were not collected to ensure anonymity. Data collection is done using a Google form, which respondents can access using the link distributed. Information obtained from respondents will be analyzed descriptively and quantitatively.

3.2. Participant

This research follows a stratified random sampling technique. The study participants consisted of 409 junior high school students in one school in the Bandung area, Indonesia. This research involved 102 students in class 7 (25%), class 8 as many as 186 students (45%), and class 9 as many as 121 students (30%). The research was conducted with students whose average age was 13 - 15 years. This research will analyze the interests of 201 male students (49%) and 208 female students (51%). The frequency of the research sample is shown in **Table 1**.

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Table 1. The population and gender balance of the student sample.

Profile		N	%
Class	**VII**	102	25%
	VIII	186	45%
	IX	121	30%
Gender	**Male**	201	49%
	Female	208	51%
Total		**409**	**100%**

3.3. Research Instrument

Students are asked to rate each item on a 5-point Likert scale: strongly disagree, disagree, unsure, agree, and strongly agree. The questionnaire uses an interest survey developed and validated by Richard Lawrence Lamb, Leonard Anneta, Jeannette Meldrum, and David Vallett in their 2011 research entitled Measuring Science Interest: Rasch Validation of the Science Interest Survey (SIS). Student interest is measured using 20 statement items consisting of five factors or indicators, including family support (F), peer interest in science (P), teacher influence (T), classroom learning experience (CR), and informal learning (I). The next data collection step was carried out by interviewing two students to find out more details about the factors that influence student's interest or lack of interest in science. The SIS contains 20 statements that will measure student's interest in science by observing it through five factors, namely family, teachers, friends, informal learning, and learning at school. The instrument consists of positive and negative statements. The distribution of statement items in the SIS instrument is shown in **Table 2**.

Apart from that, an instrument in the form of two open questions was also added to the SIS questionnaire sheet. Interviews were also conducted to strengthen the research results by exploring the reasons for students' interest in and disinterest in learning science.
Question 1: What makes you feel interested/interested in studying science?
Question 2: What makes you feel less interested/less interested when studying science?

Table 2. Statement items in the SIS instrument.

Subscale	Number
Family (F)	1, 7*, 10, 13
Teacher (T)	2*, 9, 12*, 18
Peers (P)	3, 8, 15, 20
Informal Learning (I)	4*, 6, 11, 14
Learning in the classroom (CR)	5, 16, 17, 19*
Total	20 items

* = negative statement

3.4. Data Analysis

The research instrument uses a Likert scale. Each scale has five possible responses, ranging from strongly disagree to strongly agree (points 1 - 5), and there are two assessment techniques consisting of positive and negative statements. Judging from the interest questionnaire survey used, a score of 1 - 5 (answers strongly disagree - strongly agree) is given for positive statements including statements in numbers 1, 3, 5, 6, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 20 and negative scores are assessed in reverse, namely a score of 5 - 1 (answers

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strongly disagree - strongly agree) for negative statements shown in numbers 2, 4, 7, 12, 19. For analysis of interest data, students will use descriptive statistics. The data that will be obtained includes overall student interest data, analysis of influencing factors, and interest situations based on gender.

The overall process of analyzing student interests is carried out based on categorization using the Mean and Standard Deviation. Score criteria can be determined using the Norm Reference Assessment (NRA) on a scale as in **Table 3**.

Five factors will be carried out to analyze the factors that influence student interest. The family factor (F) consists of 4 items, namely F1 - F4. The peer influence factor (P) consists of 4 items, namely P1 - P4. The teacher support factor (T) consists of 4 items, namely T1 - T4. The informal learning experience factor (I) consists of 4 items, namely I1 - I4. The final factor is the learning experience at school or in class (CR) consisting of 4 items, namely CR1 - CR4. Data analysis was also carried out using the Kruskal-Wallis test to analyze student's learning interests based on gender.

Table 3. The norm reference assessment.

Number	Range Score	Category
1.	$M + 1{,}5\ SD < X$	Very High
2.	$M + 0{,}5\ SD < X \leq M + 1{,}5\ SD$	High
3.	$M - 0{,}5\ SD < X \leq M + 0{,}5\ SD$	Good Enough
4.	$M - 1{,}5\ SD < X \leq M - 0{,}5\ SD$	Low
5.	$X \leq M - 1{,}5\ SD$	Very Low

4. RESULTS AND DISCUSSION

This research has found answers to the research questions "What is the situation of junior high school student's interest in science learning?", "What factors most strongly influence student's interest in science learning?" and "Are there differences in interest situations between male and female students?". This research aims to analyze student's interest in science learning using an interest questionnaire, Science Interest Survey (SIS), by reviewing it using five factors: family, peers, teachers, science learning at school, and science learning outside school. Researchers also revealed the strongest factors influencing students' interest in science learning from the five factors in SIS. Apart from that, research was also carried out to analyze student's interest situations based on gender differences.

Interests play a very important role in students' lives and greatly influence their attitudes and behavior. Students who are interested in learning activities will try harder than students who are not interested in learning. Attitudes and interests have different roles as psychological factors in learning. This attitude acts as a "dynamic power" in the learning process, increasing students' interest in learning. On the other hand, interest functions as a "motivator", namely the force that drives learning (Riwahyudin, 2015). Behaviors that indicate a person's interest in learning include liking what interests us and a certain tendency to pay attention to and remember things that we continue to learn. There is a feeling of interest in interesting activities and liking things that other people are interested in, this is shown through participation in activities and events.

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The research findings are to answer question 1: "What is the situation of junior high school student's interest in science learning?". Data analysis used descriptive statistics, and then categorization was carried out using mean and standard deviation. The categorization used in this research is shown in **Table 4**.

Table 4. The norm reference assessment.

Number	Range Score	Category
1	X > 4.36	Very High
2	3.77 < X < 4.36	High
3	3.17 < X < 3.77	Good Enough
4	2.58 < X < 3.77	Low
5	X < 2.58	Very Low

The results of the SIS questionnaire answers, which consist of 20 statement items (factors P, F, T, CR, I), analyze the overall situation of student's interests. The analysis results show that students have an average interest value in the medium category, namely 3.47. This shows that efforts are still needed to increase student's interest in science. Lack of student interest in learning will cause other problems in education (Pratiwi *et al*., 2018). Interest can influence the quality of a student's achievement in a particular area of study because they will focus more on the part being studied (Permatasari, 2019). Students' interests that have not been optimized can make them less focused when learning science; usually, they tend to show a less focused attitude and pay less attention to explanations. Several factors can influence the situation of interest. This research highlights five factors. The student's interest in science learning can be seen from various influencing factors, as shown in **Table 5**.

Table 5. Descriptive statistics on interests of junior high school students.

	N	Mean	Std. Deviation
Family (F)	409	3.48	0.69
Peers (P)	409	2.99	0.48
Teacher (T)	409	4.02	0.64
Informal Learning (I)	409	3.45	0.60
Leaning in the Classroom (CR)	409	3.39	0.54
AVERAGE		3.47	0.59

These data show that students are not interested in learning science, so their interest in learning still needs to be increased. Students' interests are analyzed through five factors that can influence them sequentially. The most significant influence factors include teachers, family, informal learning experiences, classroom learning experiences, and friends. The teacher factor shows the highest value, with an average of 4.02. Then, the factor that is considered to not influence students' interest in learning is friends, which has an average value of only 2,99.

Question 2: "What factors most strongly influence student's interest in learning science?" Overall, the teacher greatly influences the junior high school students' interest in learning. Qualified science teachers often influence High interest in science (Christidou, 2011). Teachers can create interesting science classrooms to encourage students to be actively involved in science, influencing their interest in science (Talton & Simpson, 1986). Teachers must help students know their goals for studying science material; this method will help them

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understand the importance of their involvement during the science learning process. The teacher's pedagogical skills when learning takes place greatly influence student's interest in science learning. Teachers have an important role in inspiring and encouraging students' interest in science, namely the teacher has control over the classroom atmosphere. Fun, interactive learning and a relaxed atmosphere interspersed with humor will maintain student's interest (Logan & Skamp, 2013). Teachers must be able to provide learning experiences for students. Thus, they will show interest in completing assignments that are not only to straighten out facts according to theory but explicitly show their experiences or important findings toward understanding science (Anderhag *et al*., 2015).

The next factor is family encouragement, which is the second highest percentage. Students will usually have a high interest in science when parents participate in their children's education, namely establishing good communication with their children regarding their school development activities and encouraging them to learn science independently (Lamb *et al*., 2012). Support from parents can also be provided from childhood. Parents who provide a 'curiosity' stimulus to children will most likely provoke ongoing learning experiences to make children interested in science content. Growing up in a family that receives a lot of intellectual encouragement in science will arouse student's interest in science (Gottfried *et al*., 2016). Student's interest in science can be fostered by family support. The reason is that they will also experience the learning process with their families, so the role of parents is very important to stimulate the emergence of curiosity and enjoyment in discussing the context of working with science concepts (Hazari *et al*., 2010). Children whose parents support them show a higher interest in and achievement in science. Encouragement from parents can take the form of explaining the importance and value of science as a discipline, life, and career. Parents can also encourage their children to participate in various activities that support their children's interest in science (Gottfried *et al*., 2016).

Informal science learning experiences outside of school can also influence student's interest in science learning. Science education at school formally emphasizes science as knowledge, concepts, and theories, while informal science education integrates theory with something more real, namely facts or issues. In this factor, male students are superior. This could be because male students prefer learning that provides real learning experiences rather than memorizing or understanding conceptual material. One of the most important goals of teaching science in the school environment is to help students gain a broader view of science and develop their attitudes toward science accordingly. The outdoor learning process provides authentic expression and experience (Glackin, 2016). Learning can be "school-based" and context-based," namely "classroom" and "natural classroom and outside the classroom" (James, 2017). The most basic thing is that informal education can directly refer to various contexts of concept use (King, 2018).

Good learning requires using appropriate technology and integrating learning with daily life processes with various activities (Asrial *et al*., 2021). However, the school environment has inherent limitations, such as a lack of infrastructure, low economic capacity, or learning standards, that must be covered within a limited time. Therefore, informal learning environments, such as science centers, provide opportunities to arouse students' interest in science learning (Şentürk & Özdemir, 2014).

The factor that does not appear to have a significant influence is the influence of friends. The strength of the relationship between peer learning interest and individual learning interest will continue to increase until it peaks in grade 9. Thus, individual interest and peer interest in science usually do not differ much to the point that it is difficult to differentiate (Talton & Simpson, 1986). Students often study and discuss science material with their peers,

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and it cannot be denied that their friends' interest in learning will spread to each individual's interest. Apart from encouragement from within, educators and parents, which can arouse student's interest in learning, there is also encouragement from friends, which can arouse interest in learning. Friends can pass on their interests through positive enthusiasm so they can be excellent (Kurniawati Rahim, 2020).

Data on the five factors of interest in learning science was analyzed. Overall, student interest can be seen from the five factors in **Table 5**.

Question 3: "Are there differences in interest situations between male and female students?" The Kruskal Wallis test analyzes students' learning interests based on gender. This research observed the interests of 201 male students and 208 female students. Based on gender, the student's interests are shown in **Table 6.**

Table 6. Kruskall Wallis test for interest analysis based on gender.

	Student scores
Chi-Square	8.777
df	1.000
Asymp. Sig.	0.003

a. Kruskal Wallis Test
b. Grouping Variable: Gender

Obtained Asymp Sig Value. (2-tailed) is 0.003, this value is smaller than 0.05, so it can be concluded that there is a difference in the average score of students between men and women. The analysis results show that the average interest score for male students is 3.42 and for female students 3.51. This shows that there are differences in interests between male and female students. Female students have a higher interest in learning science than male students.

Next, this research discussed the factors that can influence students' interest in learning and identified one of the factors that have the strongest influence. A comparison between the factors that influence the interest of male and female students is shown in **Table 7.**

Table 7. Descriptive statistics of factors influencing student interest based on gender.

Factors	**Gender**	
	Male	**Female**
F	3.36	3.60
P	3.01	2.97
T	4.00	4.04
I	3.39	3.51
CR	3.36	3.41
Average	3.42	3.51

The research results revealed that male students showed that the factor that most strongly influenced their interest in science was the teacher factor, with an average score of 4.00. Informal science learning has a very slight difference in score with the teacher factor, namely 3.39. Then, the next is the informal science learning experience factor, which is outside of school and has the same score as the family factor of 3.36. The lowest factor is the influence of friends at 3.01. There is a slight difference in interest in studying science for female

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students. Both show that teachers strongly influence their interest in learning science. For female students, the teacher factor gets an average of 4.04. However, a slight difference among male students, namely female students, shows that the next strongest factor is support from family, with an average score of 3.60. The next factor is informal science learning experiences outside of school, with a score of 3.51. The science learning experience at school scored 3.41, and the friend influence factor had the smallest number and showed quite a large difference with the strongest influence. The friend influence factor got an average score of only 2.97. Based on the results of the factor subscales obtained, there are no significant differences regarding the factors influencing the interest situation between male and female students. However, female students were found to have a higher range of interests than male students. The strongest factor that influences student's interest in science is the teacher factor. The situation of student's interest in learning is quite good, but there is still a need for improvement. Judging from the results obtained, teachers greatly influence students' interest in learning, so this is a big responsibility for teachers to prepare new strategies to encourage students' interest in science learning.

Open questions are added to the questionnaire sheet to see students' reasons regarding what makes them interested and not interested in science learning.

Question 1: What makes you interested/interested in learning science?

Most of the answers from students were due to the teacher and the practicum activities in science material. Other answers indicated that there was support from parents who helped him study and learn activities outside of school, such as visiting the science museum.

Question 2: What makes you disinterested/disinterested in learning science?

Students answer science material very difficult, especially in the calculation part. The teacher's monotonous teaching with lectures also often makes students lose interest in learning science.

Apart from that, interviews were also conducted with two students, one male and one female. Questions asked during the interview included:

(i) What makes you interested in learning science?
(ii) What makes you not interested in learning science?
(iii) What kind of science learning activities do you expect?

Several discussion points from the interview are in the following:

(i) Student 1 (male): *Science is the most enjoyable subject because there are lots of practicums that can be done. Unfortunately, my science teacher was less interesting when I was at school because he rarely came to class and had never done any practical work. In the end, I think it got boring. The activity that I hope is that teachers can make science learning more exciting, not just lectures or group learning; for example, there are observations or practicums*.
(ii) Student 2 (female): *I like science because I think science material has many benefits in life. It is easy to understand. However, we seldom have practical work at school, so learning is less interesting. I like science, but it's really weak when the science material is calculated. Coincidentally, most of my family is from science, so I am also highly interested in science. I received encouragement from my family. Thus, I could still study science at home. I hope teachers can provide easy explanations for students to understand when learning calculations. Thus, we don't just memorize formulas*.

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Teachers are the strongest factor influencing student's interest in learning. Teacher behavior and support in the classroom can support the development of student interest, especially for individual students with low interest (Großmann & Wilde, 2020). Teacher behavior can support students emotionally (Aldrup *et al*., 2022). Its form can positively relate to student interests, such as effort and perseverance, warm and open relationships with students, and student involvement (Zee *et al*., 2021). Male students feel interested in learning if it is carried out with real experience, meaning that it is not just about reading, memorizing, or understanding conceptual material. They will like informal learning, such as visits to the science center. Informal learning or learning carried out outside the classroom emphasizes context, increases collaborative relationships between students, and focuses their interests during the activity. When learning outside the classroom, teachers must plan activities well to ensure that students can learn (Ayotte-Beaudet, 2020), If activities outside of class are the same as activities usually carried out in class, then this will not provide any context or value for students (Lupión-Cobos & López-Castilla, 2017). This factor also shows that teachers still play the strongest role in planning learning, so teachers have a big influence in supporting student's interests. Meanwhile, female students feel interested in science if they get full support from their families regarding their learning activities and progress. The family, especially parents, is important in directing, guiding, and supporting their children to learn. Education in the family begins from childhood, and parents stimulate their child's curiosity, facilitate the educational process, and encourage and support him to discover many new experiences. Family influence, especially the role of parents in their children's education, is very important to stimulate their children's interest in science. This statement has also been recognized and supported by the National Science Teachers Association. Parental involvement will influence children's interest and learning development at home, school, and the way children learn through other communities they join**.**

5. CONCLUSION

The results of the research show that students' interest in learning science is 3.47, namely in the good enough level of interest, and this research also succeeded in identifying factors that can influence student's interest in learning science in sequence, namely teacher, family, informal learning experiences, learning experiences at home. class, and friends of 3.90; 3.37; 3.35; 3.25; and 2.90. Analysis of students' interests based on gender was carried out using the Kruskall Wallis Test to obtain Asymp Sig values. (2-tailed) of 0.003, this value proves that there is a difference in the average score of students between men and women, namely 3.42 and 3.51, respectively, which shows that female student's interest in learning is higher. Based on these results, it can be seen that the teacher factor is the most important in influencing student's interest in learning science. Future research can be further developed regarding increasing student interest in science learning. This research can provide initial knowledge about the student's interest in science, the factors that influence it, and the strongest factors that influence the student's interest. Future researchers can explore the factors of interest in learning more broadly. Perhaps teachers can implement interactive learning media and carry out various variations of science learning in terms of methods, approaches, models, and learning strategies to observe an increase in the situation of interest among students.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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