



SCIENCE TEACHERS' PEDAGOGICAL APPROACHES AND GRADE 12 LEARNERS' LEARNING INTEREST IN SCIENCE: A CORRELATIONAL STUDY

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Abstract:

Science teacher's pedagogical approaches play necessary roles in learner learning, motivation and interest as approaches being done by the teacher influences the outcome of the learner's learning. A science teacher must be successful in relaying the concepts of what they are teaching to the learners in order for them to develop background, abstract reasoning skills and critical thinking on science. Teacher's pedagogical approaches may be a factor affecting learner interest in learning science. This study aimed to determine the level of relationship between teacher's pedagogical approach and learner interest in learning science. The study utilized a mixed method involving quantitative type of research to determine the relationship between teacher's pedagogical approaches and learner interest in learning science. Furthermore, the participants of this study were the Grade 12 learners as they have vast experiences in different teachers in their science-related subjects throughout their academic experiences. A total of one hundred eighty-five were selected as participants in the study through a simple-random sampling technique implemented by the researcher in selecting respondents. Significant results of the study showed that there is a positive weak relationship between the teacher's pedagogical approaches and learners' interest in learning science. This is because some interest factors that emerged do not entirely depend on the teachers' pedagogical approaches such as student's curiosity and being intrigued in scientific knowledge.

Keywords: pedagogical approaches, student interest, science

I. INTRODUCTION

Science is considered as one of the most complex subjects to learn as it requires understanding of basic concepts to application of concepts objectively. The teachers are known to as the standard bearers of education as they are the one who forge and shape the students' future. It is sensible that a teacher must implement strategies that can make students comfortable in learning and shape them for their future. In order to be an effective educator, a teacher should make an adjustment in terms of their pedagogical approaches as each and every student differs in learning style for their students to catch their attention every time that they will be having a class. The teachers are playing the most important part in fostering the young minds to dream and their success depends on how they are forged by the educators.

Moreover, pedagogy is defined as the teacher's techniques and methods of teaching. It may include the way how they teach and what are their teaching methods being executed in order to imply knowledge to the students. The efficacy of their pedagogical approach in

teaching is measured by the students' interest and motivation in learning. It is up to the teacher on how they will foster the students to get their attention and this is where their strategy will play its role.

Pedagogical approach is one of the long-term problems of science teachers as they are not able to figure out how to teach science effectively to their students. As a teacher struggle in their teaching strategy, students lose interest in listening to them and can create problems to the flow of discussion such as distractions and lose focus while the teacher is discussing. As this problem was seen, there may be a relationship in the teacher's pedagogical approach towards the student affecting their learning interest and focus in which teachers may have a problem upon adjusting to their students.

Hence, this study aims to determine if there is a significant relationship between teacher's pedagogical approaches to the learning interest of the students. Specifically, it aims to answer the following: 1.) determine the teacher's pedagogical approaches

being executed by the teacher 2) determine the level of student interest in terms of learning science, and 3) show if there is a significant relationship between the pedagogical approaches of the teacher and the student interest in learning science.

Nyamwange (2016) significant findings suggested that student interest is significant in determining individual's career choices. Interest was most often seen as a driving force in pursuing a good career decisions. A study suggested that, "students with a high cognitive potential for science do not pursue careers as scientists or engineers because they lost their interest during school" (Krapp & Prenzel, 2011, p. 42).

Interest is what promotes long-term information storage and learning motivation, and is the result of the interaction between the learner and their surroundings. It is also seen as the center of how one determines what certain type of information is to select and process in preference to others. Rotgans and Schmidt (2017) defined interest as an essential ingredient to spice up learning. To be specific, interest is associated with recognizable willingness to acquire new specific area of knowledge.

The importance of engaging the students in their education must not be ignored. The increased interest in a subject also increases the student attainment (Hulleman & Harackiewicz, 2009). If the students have high interest in something, they tend to make the best out of themselves and have high attainment. According to Darlington (n. d.), "these investigations should cover not only the importance of the physical environment but also the less tangible aspects of the classroom such as the teaching and learning activities, and the relationships formed between teachers and students." As teacher is the key person that takes part in stimulating and nurturing the interest for a certain subject, there may be usual traits or approaches to teaching which apparently capture the interest of students.

However, various students rapidly lose their attentiveness in science and cease seeing it as an expedient option for their future (Christidou, 2011). Science thus appears to be a lovehate subject due to the reason that it induces strong feelings to the children (Osborne et al., 2010). Along with, there are students also who are authentically interested on one field of science but not in the other science subjects such as physics and chemistry.

Ainley, M. & Ainley, J. (2011) study concluded that there is a strong predictive relation between students' sense of value to the subject, enjoyment in learning science, interest in learning science and interest to learn more about science. The study greatly explains why there is a need to make the students feel the essence of every topic in order for them to enjoy the topic and have the interest to learn more, and go deeper within the lessons.

Teachers must make use of effective teaching strategies to assure conceptual understanding of students in science. Hudson (2013) suggested several aspects of pedagogical practices a teacher can employ in teaching namely: (1) planning based on the given teaching curriculum; (2) timetabling lessons in order to meet the competencies in the curriculum; (3) preparation for teaching; (4) implementing effective teaching strategies; (5) content knowledge or lesson mastery; (6) problem solving; (7) questioning skills necessary for student reflection and realization; (8) classroom management, (9) implementation of plans, (10) assessment of student knowledge, and (11) viewpoints for teaching.

According to Gulistan et al. (2015), they found out that teachers who are teaching science primarily focused on understanding the concepts of science topics such as physics rather than going into deeper understanding with the application such as problem solving which is the least used strategy by the teachers. Moreover, Gulistan et al. (2015) further explained that this scenario explains that a variety of higher cognitive skill teaching strategy are lacking among teachers. This concludes that teaching science subjects is not just about memorizing things over and over but, it also requires abstract reasoning, problem solving and application in order to fully understand the topic.

Hagay & Baram-Tsabari (2015) suggested that there should be a practical, accessible, and flexible way to integrate students' existing interests in science with disciplinary science learning, governed by the respect for their autonomy and needs. Abungu et al. (2014) found out that students who are exposed to inquiry-based teaching approaches enhance student achievement in science subjects as they were able to interpret, measure and observe data involved in investigative activities such as experiments. Minner et al. (2010) study strongly supports this study and also found out that inquiry-based teaching resulted into positive impacts on student content learning and retention. Minner et al. (2010) further emphasized that teaching strategies that actively engage students in learning through scientific investigations are more likely to increase conceptual knowledge than strategies that rely on passive teaching techniques such as teaching only the concepts of topic.

Statement of Problem

This study aimed to determine if there is a significant relationship between teachers' pedagogical approach and student interest in learning science in the Third Congressional District of Schools Division Office I Pangasinan during the school year 2024-2025.

Specifically, it aimed to answer the following questions:

1. What are the pedagogical approaches being executed by the teachers in teaching science?
2. What is the level of Grade 12 students' interest in learning science?
3. Is there a significant relationship between teacher's pedagogical approach and students' interest in learning science?
4. Based on the findings, what updated pedagogical approaches can be proposed to improve the interest of Grade 12 learners in Science?

METHODOLOGY

This chapter presents the method and procedure employed to answer the research problems identified in the study. More specifically, it discusses the research design, sources of data, instrumentation and data collection and tools for data analysis.

Research Design

The study utilized a mixed method research design. Specifically, a quantitative type of research consisting of descriptive and correlational study. Descriptive and correlational research were done to determine the relationship between teacher's pedagogical approaches and student interest in learning in science among Grade 12 Senior High School students. In particular, descriptive type of research describes the phenomena being studied. On the other hand, correlational type of research measures relationship of two variables in the study.

Instrumentation and Data Collection

In conducting the study, a self-constructed survey questionnaire was used in gathering the data from the participants. The researchers underwent several discussions with the research adviser in formulating the self-made survey questionnaire. It was designed using a four-point Likert scale with 1 (equivalent to strongly disagree) being the lowest and 4 (equivalent to strongly agree) being the highest to determine the pedagogical approaches being executed by the teacher and measure the level of interest in learning science of the Grade 12 students. Each item on the questionnaire used a four-point scale along with their respective descriptive interpretation. The scale is shown as follows:

4.00 – Strongly Agree 2.00 – Disagree
3.00 – Agree 1.00 – Strongly Disagree

The items in the survey questionnaire consists of 15 (fifteen) pre-determined series of statements in each factor. Moreover, it also became the basis in measuring the relationship between the pedagogical approaches of the teacher the respondents have encountered and their interest in learning science. Thus, all the statements in the questionnaire have a total of 30 (thirty) statements.

The data gathering procedure commenced after the proposal has been approved by the research professor. First, the researchers created a self-constructed survey questionnaire that will be used as a tool and was validated. Second, after the tool has been validated and revised by the research adviser and research teacher, the tool was tested to see if it is reliable and valid to use for the study. The tool underwent reliability analysis to test if it is standard to utilize in the study by the researchers. Furthermore, the tool must obtain a Cronbach alpha of .750 above to be considered standard. Third, after the tool passed the reliability analysis, the floating of questionnaires were conducted. The researchers wrote a letter to the school principal and school department academic coordinator seeking permission to formally conduct and administer the study. After the permission is sought and approved, the researchers again wrote permission letters to the advisers seeking permission to float the survey to their respective class advisories. The floating of survey questionnaires in the Grade 12 Senior High School students was conducted through an online survey via Google Forms. Lastly, after the floating of the questionnaires, the researchers tabulated and analyzed the data gathered in the survey questionnaire.

Tools for Data Analysis

The gathered data from the respondents were computed and analyzed by descriptive statistics and bivariate correlation. Moreover, the demographic profile of the respondents are computed with the use of percentage formula to show population information. The data were also extracted through the use of basic statistics such as mean and standard deviation under descriptive statistics. Furthermore, the data gathered through the survey questionnaire was extracted through the use of mean to interpret data to be analyzed along with their respective descriptive interpretation. Standard deviation was used to show the spread of distribution in the scores in the statements of the survey questionnaire. Lastly, in the bivariate correlation, Pearson's correlation coefficient was used in determining the relationship of variables in study.

Percentage formula is shown as follows:

$$\% = \frac{\square}{N} \times 100$$

Wherein % is the percent, \square is the frequency and N is the number of cases.

Mean formula is shown as follows:

$$\mu = \frac{\sum \square \square}{\square}$$

Wherein μ is the mean, $\sum \square \square$ is the summation of index scales and n is the number of cases.

Standard Deviation formula is shown as follows:

$$\sigma = \sqrt{\frac{\sum (\square \square - \mu)^2}{\square}}$$

Wherein, σ is the standard deviation, $(\square \square - \mu)^2$ is the index score subtracted by the mean squared and n is the number of cases.

Pearson's r coefficient formula is

shown as follows:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

Wherein r is the correlation coefficient, $\square \square$ is the values of the x-variable in a sample, \bar{x} is the mean of the values of the x-variable, $\square \square$ is the values of the y-variable in a sample and \bar{y} is the mean of the values of the y-variable.

After the r coefficient was obtained, the data underwent hypothesis testing. The twotailed significance levels of the variable pairs were compared to the alpha level. For this study under social science, the typical set alpha level is at 0.05. If the results of the computed significance level obtained a value lesser than 0.05 or equal to 0.05, the researchers then will have to reject the null hypothesis (H_0) and accept the alternate hypothesis (H_1). Whereas, if the significance level is greater than 0.05, the researchers then will have to accept the null hypothesis (H_0) and reject the alternate hypothesis (H_1).

RESULTS AND DISCUSSION

This chapter was devoted to the presentation, analysis and interpretation of the data gathered relative to sub-problems in the study.

The Relationship between Teachers' Pedagogical Approaches and Students' Learning Interest in Science

The Table 1 showcases the mean factor of the pedagogical approaches being executed by the teacher that the participants have encountered. Among the fifteen (15) statements, thirteen (13) were rated Agree and two (2) were rated Strongly Agree. The participants' responses mean averaged to 3.09 ($s = .617$) valued to a rating description of Agree. Moreover, statement number one (1): "Our teacher uses technology-integrated teaching method like PowerPoint presentations and video presentations in order to further emphasize the lesson." obtained the highest mean rating of 3.55 ($s = .499$) with the valued of descriptive rating of Agree. On the other hand, statement number twelve (12): "Our teacher uses motivational techniques (e. g. highest scorers get incentives

such as additional points in exam) in order for us to strive hard towards science subject.” obtained the lowest mean of 2.74 ($s = .759$) with the value of descriptive rating Agree.

Table 1. Pedagogical Approaches Executed by the Teacher

Item	Mean	Std. Deviation	Interpretation
Our teacher uses technology-integrated teaching method like PowerPoint presentations and video presentations in order to further emphasize the lesson.	3.55	.499	Strongly Agree
Our science teacher allows us to master basic concepts of the lesson before we proceed to a more complex level of the lesson.	3.10	.630	Agree
Our science teacher uses real-life examples and analogies in order to understand the lesson.	3.11	.593	Agree
Our teacher is approachable and we can freely ask questions without hesitation.	2.99	.711	Agree
Our science teacher engages us in group activities so that we can learn together with my classmates.	3.02	.675	Agree
Our science teacher provides resources (e. g. handouts, modules and other reading materials) to learn more and further understand the lessons.	3.16	.630	Agree
Our teacher provides activities relevant to the lesson.	3.28	.528	Strongly Agree
Our teacher engages us in laboratory activities in order to see the real picture of what they are teaching.	2.81	.793	Agree
Our teacher asks us questions that is something related to the topic as an introduction in order for us to picture the concept and to get the gist of the lesson instead of directly telling what we need to learn in order for us to think critically.	3.25	.484	Agree
Our teacher always gives us lectures before, while and after discussing.	3.04	.654	Agree
Our teacher repeats the explanations until everyone gets it.	3.02	.675	Agree
Our teacher uses motivational techniques (e. g. highest scorers get incentives such as additional points in exam) in order for us to strive hard towards science subject.	2.74	.759	Agree
Our teacher engages us in discussions by asking questions to have an interactive learning environment.	3.17	.488	Agree
Our teacher gives us topics to report to study it with ourselves and share it with the class.	2.90	.696	Agree
Our teacher assesses (e. g. quizzes, group activities, graded recitations) us every chapter we finish in order to what we have learned during their discussions.	3.20	.498	Agree
DESCRIPTIVE RATING	3.09	.617	Agree

The Table 2 exhibits the mean factor of the students' interest in science. Among the fifteen (15) statements, there were fourteen (14) statements that were rated Agree and one (1) was rated Strongly Agree. The participants' responses mean averaged to 3.01 ($s = .668$) valued to a rating description of Agree. Consequently, item number seventeen (17): “The wonders of scientific knowledge (e. g. how the earth rotates, how human digest food and how plant grows food) made me interested to further learn from it.” obtained the highest mean rating of 3.22 ($s = .608$) with the descriptive rating of Strongly Agree. On the other hand, item number twentysix (26): “I enjoy learning science in school that's why I want to take up science courses in college.” obtained the lowest mean of 2.65 ($s = .807$) with the value of descriptive rating Agree.

Table 2 Student Interest in Science

Item	Mean	Std. Deviation	Interpretation
I like to engage discussions related to science.	3.11	.659	Agree
The wonders of scientific knowledge (e. g. how the earth rotates, how human digest food and how plant grows food) made me interested to further learn from it.	3.26	.608	Strongly Agree
I actively listen in our science subject discussions.	3.01	.590	Agree
I watch science-related educational videos to increase my knowledge in science.	2.96	.671	Agree
I dream of becoming engaged in scientific field someday (e. g. doctor, engineer, chemist).	2.89	.952	Agree
I share what I have learned in school about science to other people like my family, friends and classmates.	2.95	.623	Agree
I like reading books, articles and other reading materials related to science.	2.78	.691	Agree
I get decent scores and grades in our science subjects.	2.97	.556	Agree
I enjoy doing laboratory activities (e. g. experimentations).	3.05	.686	Agree
I am intrigued and inspired by people who are engaged in scientific field (e. g. physicists, engineers, chemists).	3.05	.678	Agree
I enjoy learning science in school that's why I want to take up science courses in college.	2.65	.807	Agree
I want to discover something beneficial to humanity (e. g. inventing new technology, ways to save energy) someday that is why I build my interest in science.	2.90	.767	Agree
Science helped me to understand the world around me that is why I am interested to learn more about it.	3.17	.583	Agree

My curiosity on how everything else in this world works led me to know more about science.	3.18	.540	Agree
Everything that exist around me is science and I want to further learn more about it.	3.25	.610	Agree
DESCRIPTIVE RATING	3.01	.668	Agree

The Table 3 shows the bivariate correlation between pedagogical approaches executed by the teachers and students' interest in learning science. As presented below, the pedagogical approaches executed of the teachers and students' interest in learning science suggests weak correlation ($r = .383$). On the other hand, the p value ($p = 0.000$) is lower than the set alpha level ($\alpha = 0.05$) which manifests a significant relationship between the two variables. Hence, this suggests that the null hypothesis (H_0) must be rejected and accept the alternate hypothesis (H_1).

H_1 : There is a significant relationship between teacher's pedagogical approaches and student interest in learning science.

H_0 : There is no significant relationship between teacher's pedagogical approaches and student interest in learning science.

Table 3 Pearson's r showing the Relationship between Teacher's Pedagogical Approaches and Student's Interest in Learning Science

Teacher's Pedagogical Approaches	Student Interest in Learning Science
Pearson Correlation (Pearson's r)	.383
Sig (2-tailed)	.000
n	185

Moreover, the Table 4 showcases the summary of the factors' mean with their respected interpretations. The data manifests that the pedagogical approaches of the teachers obtained an average mean of 3.09 interpreted as Agree and Student interest in learning science obtained an average mean of 3.01 interpreted as Agree respectively.

Table 4 Summary of Mean Score per Factor

Factors	Mean	Interpretation
1. Pedagogical Approaches of the Teacher	3.09	Agree
2. Student Interest in Learning Science	3.01	Agree

Teachers' pedagogical approaches are believed to affect students' interest in learning. When the teacher manifests ineffective teaching methods, students tend to lose focus on the subject and may show negative attitude towards the subject. The negative attitude of the students towards a subject may be a result of student's loss of interest which may lead to weak aptitude. Moreover, the teachers are very accountable for the enhancement of the students' skills. This means that if a teacher is effective, the students will manifest great interest towards science.

Pedagogical Approaches of the Teacher in Science

Significant results showed that the teachers mostly integrate technology in their teaching method like PowerPoints and video presentations to further emphasize their lessons. Moreover, it also shows that teachers provide activities that are relevant to the lesson, provide learning resources such as handouts and inquiry-based teaching methods are also being implemented to the students.

Rehmat and Bailey (2014) study concluded that technology-integrated teaching in science manifested positive results as students improved in their learning. The use of technology in the 21st century education is very relevant as the growth of technological interests are arising and as well as made it through education. Integrating technology in science teaching can help increase students' interest and can be supported by traditional methods of teaching. Many teachers today use PowerPoint presentations and video presentations to further enhance their students' learning experience.

Ergül et al. (2011) study concluded that inquiry-based pedagogical approaches enhance students' science processing skills and attitudes. Moreover, inquiry-based teaching was able to stimulate excitement to the students (Shamsudin et al., 2013). The use of inquiry-based teaching method is very applicable in science teaching as it guides students towards a certain knowledge that is needed to be implied. Moreover, it stimulates students' critical thinking and enables them to easily pick up concepts that they need in order to understand the gist of the lessons they tackle. As their mind gets tickled as they think, they tend to think deeper and different possibilities emerge to their mind.

Student Interest in Science

The results emerged from the participants suggested that their interest in learning science were high. Some of the relevant driving force that sparks their interests are their curiosity, amusement in scientific knowledge and high interests in engaging laboratory activities such as experimentations.

Weible & Zimmerman (2016) stated that curiosity is an integral aspect of learning science. Curiosity in science is said to be related to information-seeking behaviors such as what is being seen and observed in learning environments (Jirout & Klahr, 2012). Moreover, it can be also defined as a desire for a content-specific knowledge about natural phenomena (SpektorLevy et al., 2013). As emerged in this study, curiosity is one of the factors that sparks their learning interest in science. When someone tends to be curious, they will ask questions and look for a specific answer to satisfy their questions. For example, when someone tends to ask how a machine works, Physics kicks into action. Once it was answered, it may possibly lead to another question which keeps branching. Hence, being curious and having a freedom to scrutinize their curiosities was influential in the interest in science (Maltese & Tai, 2010).

The Relationship between Teacher's Pedagogical Approaches and Student's Interest in Learning Science

The results showed that there is a positive weak correlation relation between teachers' pedagogical approaches and student's interest in learning science. Moreover, Winter and Foster (n.d.) study found out that there is a connection with teacher's

pedagogy in their learning engagement. The student engagement can be derived to their interest as engagement is one of the products of quality teaching as well as an indicator of emerging interest towards the subject. This can be a possible evidence that a student who actively participates have high interest in the subject because they create an interactive environment.

However, as far as the findings suggest weak correlation between the two variables, there may be other different sources of interest students have. The pedagogical approaches executed by the teacher indicators show that they have encountered all of the approaches included in the statements in which inquiry-based teaching and technology-integrated teaching are the highest. Although it can be observed that the level of students' interest were high, it resulted into weak correlation with the pedagogical approaches. Moreover, one of the highest items in the student interest predictor is their curiosity which is a predictor that is either related or not related to the pedagogical factors but in their own driving force to learn science. As Luce & Hsi (2014) argued, by understanding the nature of curiosity expression and interest, how it changes as time goes by, and how it relates to science learning experiences, interventions can be done in order for students to reignite or refuel their curiosity.

Summary

The study presents an analysis of the pedagogical approaches implemented by science teachers and the level of interest Grade 12 learners have in science. The results show that most participants rated their teachers' pedagogical methods positively, with 13 out of 15 statements rated as "Agree" and two rated as "Strongly Agree." The highest mean rating was obtained for the use of technology in teaching, such as PowerPoint and video presentations, which helped emphasize the lesson. However, motivational techniques, such as offering incentives, received the lowest rating. Overall, the participants' average mean score for pedagogical approaches was 3.09, which was interpreted as "Agree."

In terms of student interest in science, the results showed that the majority of participants expressed a high level of interest in the subject. Fourteen out of the fifteen statements regarding student interest were rated "Agree," with one rated "Strongly Agree." The highest mean score was related to the curiosity about scientific phenomena, such as how the Earth rotates or how plants grow food. On the other hand, the lowest mean score was associated with the intention to pursue science courses in college, indicating a slight gap between general interest and future academic plans in the field. The overall average mean score for student interest was 3.01, interpreted as "Agree."

Finally, the study highlights the importance of teachers' pedagogical methods in shaping students' interest and engagement in science. The results suggest that technology integration, inquiry-based teaching, and relevant learning resources contribute to a more engaging and effective science learning environment. While a weak correlation was found between teaching approaches and student interest, factors like curiosity and laboratory activities were strong motivators for students. Effective pedagogical strategies are essential for fostering student engagement, and teachers' ability to provide an interactive and stimulating learning experience is crucial in sustaining student interest in science.

Conclusion

The study aimed to show the significant relationship between the pedagogical approaches of the teachers and students' interest in learning science. Based on the data gathered, the outcomes of the study showed that there is a positive weak relation between the two variables being observed. Moreover, the level of the interest of the students are high and the pedagogical approaches stated in the survey are likely to have been encountered already by the participants. Some of the pedagogical approaches involves the integration of technology in teaching and inquiry-based approach method in which can be combined by the teacher to innovate approaches in teaching. Some of the driving force of the students to learn more about science is their curiosity and engaging in scientific activities such as laboratory activities.

To sum up, this study provided an idea on how related the pedagogical approaches of the teachers to the interest of students in learning science. The teacher plays a big role in the development of students in building their future. As for students, their interest is also important in forging their competence in science. The teachers may execute every pedagogical approach their hands can get but aptitude still lies within the student. Furthermore, teachers are not the only one who provides interest in the learning of the student but also the students themselves develop their own interest in the subject in different ways. Hence, this study provides a call to improve science teaching in the schools in order for others who does not have interest to spark and further boost their interest in science. Moreover, to become a science-competent institution and can be of great help to those who are not that interested in science and those who lack necessary competence in science cope up and can get along with others.

Recommendations

Based on the results, the researchers made the following suggestions and recommendations:

- 1. For the parents.** When their children manifest interest in science, they should support their children and guide them towards their knowledge development. As a parent, they have the responsibility to check their children's progress and may approach the teacher if they see that their children experience difficulty in order to be followed up by the teacher. They can also engage their children in science learning science by introducing to them science-related channels on television or in their mobile phones as early as possible to build interest as early as possible.
- 2. For the students.** Students should continue to develop their interests in science. They can also forge their knowledge with the use of the resources available and foster themselves to engage in scientific field. As we go through the digital age, there are many sources of information that can be seen around the internet wherein one can hone their knowledge such as science-related educational videos on the internet.
- 3. For the science teachers.** Science teachers should develop and hone their teaching methods in order to have an effective teaching and to effectively imply knowledge to the students for them to develop their interest. Aside from that, they should also continue learning more about the things that they need to teach. The combination of being knowledgeable, skillful and effective teaching is the best trait of a science teacher.
- 4. For the school administrators.** School administrators must see to it that their teachers are performing well in terms of their teaching methods. They should provide trainings that can further enhance their skills in teaching such as workshops and seminars. This will be of great help in bringing a strong image in the school as many students will move to enhance their scientific knowledge.

5. For the school. The school being a science-competent institution can become one of the reasons why other students should enroll in the school and can be one of the expertise of the school. The school should develop science competence in all levels especially if they offer STEM (Science, Technology, Engineering and Mathematics) courses. The school may utilize growing demand of scientific knowledge as the world widely uses the products of science and is widely advancing quickly to their advantage to increase its quality and have more students who have high scientific interest study in their institution.

6. For the future researchers. This study may serve as a future reference as this study needs more validation in order to emphasize the relation between the pedagogical approaches of the teacher and the interest in learning science of the students.

REFERENCES

- Abrantes, J. L., C. Seabra, and L. F. Lages. (2007). Pedagogical Affect, Student Interest, and Learning Performance. *Journal of Business Research*, 60(9), 960–964. <https://doi.org/10.1016/j.jbusres.2006.10.026>.
- Abudu, Kamal A. & Gbadamosi, Muideen R. (2014). Relationship between teacher's attitude and student's academic achievement in senior secondary school chemistry. A case study of Ijebu-Ode and Odogbolu Local Government Area of Ogun state. *Wudpecker Journal of Educational Research*, 3(3), 35–43.
- Abungu, H. E., Okere, M. I. O., & Wachanga, S. W. (2014). The Effect of Science Process Skills Teaching Approach on Secondary School Students' Achievement in Chemistry in Nyando District, Kenya. *Journal of Educational and Social Research*, 4(6), 359–372. <https://doi.org/10.1002/tea.10009>
- Ainley, M., & Ainley, J. (2011). Student engagement with science in early adolescence: The contribution of enjoyment to students' continuing interest in learning about science. *Contemporary Educational Psychology*, 36(1), 4–12. <https://doi.org/10.1016/j.cedpsych.2010.08.001>
- Aziz, F. & Kazi, A. (2019). Role of Teachers in Students' Classroom Participation Universities. *International Journal of Educational Enquiry and Reflection*, 4(1), 46–57.
- Bang, E., & Luft, J. A. (2013). Secondary Science Teachers' Use of Technology in the Classroom during Their First 5 Years. *Journal of Digital Learning in Teacher Education*, 29(4), 118–126. <https://doi.org/10.1080/21532974.2013.10784715>
- Christidou, V. (2011). Interest, attitudes and images related to science: Combining students' voices with the voices of school science, teachers, and popular science. *International Journal of Environmental and Science Education*, 6, 141–159. <https://eric.ed.gov/?id=EJ944846>
- Costa, C., Cardoso, A. P., Lima, M. P., Ferreira, M., & Abrantes, J. L. (2015). Pedagogical Interaction and Learning Performance as Determinants of Academic Achievement. *Procedia - Social and Behavioral Sciences*, 171, 874–881. <https://doi.org/10.1016/j.sbspro.2015.01.203>
- Darlington, H. (n. d.). Understanding and Developing Student Interest in Science: An Investigation of 14-16 year-old Students in England. <https://discovery.ucl.ac.uk/id/eprint/10024817/1/H%20Darlington%20Understanding%20student%20intetest%20in%20science.pdf>
- Ergül, R., Şimşekli, Y., Çaliş, S., Özdilek, Z., Göçmençelebi, Ş., & Şanlı, M. (2011). THE EFFECTS OF INQUIRY-BASED SCIENCE TEACHING ON ELEMENTARY SCHOOL STUDENTS' SCIENCE PROCESS SKILLS AND SCIENCE ATTITUDES. *Bulgarian Journal of Science & Education Policy*, 5(1), 48–68.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher Technology Change. *Journal of Research on Technology in Education*, 42(3), 255–284. <https://doi.org/10.1080/15391523.2010.10782551>
- Gultom, S., Hutauruk, A. F. & Ginting, A. M. (2020). Teaching Skills of Teacher in Increasing Student Learning Interest. *Budapest International Research Critics and Institute-Journal*, 3(3), 1564–1569. <https://doi.org/10.33258/birci.v3i3.1086>
- Hagay, G., & Baram-Tsabari, A. (2015). A strategy for incorporating students' interests into the high-school science classroom. *Journal of Research in Science Teaching*, 52(7), 949–978. <https://doi.org/10.1002/tea.21228>
- Hayden, K., Ouyang, Y, Scinski, L., Olszewski, B., & Bielefeldt, T. (2011). Increasing student interest and attitudes in STEM: Professional development and activities to engage and inspire learners. *Contemporary Issues in Technology and Teacher Education*, 11(1), 47–69. <https://citejournal.org/volume-11/issue-11/science/increasing-student-interest-and-attitudes-in-stem-professional-development-and-activities-to-engage-and-inspire-learners>
- Heck, R. H. (2009). Teacher effectiveness and student achievement. *Journal of Educational Administration*, 47(2), 227–249. <https://doi.org/10.1108/09578230910941066>
- Hudson, P. (2013). Strategies for mentoring pedagogical knowledge. *Teachers and Teaching*, 19(4), 363–381. <https://doi.org/10.1080/13540602.2013.770226>
- Hulleman, C. and Harackiewicz, J. M. (2009). Promoting interest and performance in high school science classes. *Science*, 326, 1410–1412.
- Hussain, A., Azeem, M., & Shakoor, A. (2011). Physics Teaching Methods: Scientific Inquiry Vs Traditional Lecture. *International Journal of Humanities and Social Science*, 1(19), 267–276. http://www.ijhssnet.com/journals/Vol_1_No_19_December_2011/28.pdf
- Jirout, J., & Klahr, D. (2012). Children's scientific curiosity: In search of an operational definition of an elusive concept. *Developmental Review*, 32(2), 125–160.
- Karpudewan, M., & Chong Keat, M. (2017). The effects of classroom learning environment and laboratory learning environment on the attitude towards learning Science in the 21st-century Science lessons. *Malaysian Journal of Learning and Instruction (MJLI), Special issue on Graduate Students Research on Education*, 25–45. <https://doi.org/10.32890/mjli.2017.7795>
- Khoiriyah, A. & Husamah, H. (2018). Problem-based learning: Creative thinking skills, problem-solving skills, and learning outcome of seventh grade students. *Indonesian Journal of Biology Education*, 4(2), 151–160. <https://doi.org/10.22219/jpbi.v4i2.5804>

- Krapp, A., & Prenzel, M. (2011). Research on interest in science: Theories, methods, and findings. *International Journal of Science Education*, 33, 27–50. <https://doi.org/10.1080/09500693.2010.518645>
- LaBarbera, R. (2013). The Relationship Between Students' Perceived Sense of Connectedness to the Instructor and Satisfaction in Online Courses. *The Quarterly Review of Distance Education*, 14(4), 209–220.
- Luce, M. R., & Hsi, S. (2014). Science-Relevant Curiosity Expression and Interest in Science: An Exploratory Study. *Science Education*, 99(1), 70–97. <https://doi.org/10.1002/sce.21144>
- Ludovice, P., & MacNair, D. (2019). USING HUMOR IN THE STEM CLASSROOM TO ENHANCE KNOWLEDGE TRANSFER. *11th International Conference on Education and New Learning Technologies*, Palma, Spain, 1–3 July, 2019.
- Makewa, L. N., Role, E., & Genga, J. A. (2011). Teachers' use of humor in teaching and students' rating of their effectiveness. *International Journal of Education*, 3(2), 1–17. https://www.researchgate.net/profile/Lazarus_Ndiku_Makewa/publication/216008629_Teachers'_Use_of_Humor_in_Teaching_and_Students'_Rating_of_Their_Effectiveness/links/0ef19b44eed69b6cac7d6fcd.pdf
- Maltese, A. V., & Tai, R. H. (2010). Eyeballs in the fridge: Sources of early interest in science. *International Journal of Science Education*, 32(5), 669–685. <https://doi.org/10.1080/09500690902792385>
- Mazer, J. P. (2012). Development and Validation of the Student Interest and Engagement Scales. *Communication Methods and Measures*, 6(2), 99–125. <https://doi.org/10.1080/19312458.2012.679244>
- Miles, R. (2015). Tutorial instruction in science education. *Cypriot Journal of Educational Science*, 10(2), 168–179.
- Minner, D. D., Levy, A. J., & Century, J. (2010). Inquiry-based science instruction-what is it and does it matter? Results from a research synthesis years 1984 to 2002. *Journal of Research in Science Teaching*, 47(4), 474–496. <https://doi.org/10.1002/tea.20347>
- Mojavezi, A., & Tamiz, M. P. (2012). The Impact of Teacher Self-efficacy on the Students' Motivation and Achievement. *Theory & Practice in Language Studies*, 2(3), 483–491. <https://doi.org/10.4304/tpls.2.3.483-491>
- Nguyen, N., Williams, J., & Nguyen, T. (2012). The use of ICT in teaching tertiary physics: Technology and pedagogy. *Asia-Pacific Forum on Science Learning and Teaching*, 13 (2), 1–19.
- Nyamwange, J. (2016). Influence of Student's Interest on Career Choice among First Year University Students in Public and Private Universities in Kisii County, Kenya. *Journal of Education and Practice*, 7(4), 96–102.
- Osborne, J., Simon, S., & Collins, S. (2003). Attitudes towards science: A review of the literature and its implications. *International Journal of Science Education*, 25, 1049–1079. <https://doi.org/10.1080/0950069032000032199>
- Rehmat, A. P., & Bailey, J. M. (2014). Technology Integration in a Science Classroom: Preservice Teachers' Perceptions. *Journal of Science Education and Technology*, 23(6), 744–755.
- Rotgans, J. I., & Schmidt, H. G. (2017). The Role of Interest in Learning: Knowledge Acquisition at the Intersection of Situational and Individual Interest. *The Science of Interest*, 69–93.
- Sauer, K. (2012). The Impact of Student Interest and Instructor Effectiveness on Student Performance. *Education Masters*,
- Schmidt, J. A., Rosenberg, J. M., & Beymer, P. N. (2017). A person-in-context approach to student engagement in science: Examining learning activities and choice. *Journal of Research in Science Teaching*, 55(1), 19–43. <https://doi.org/10.1002/tea.21409>
- Shamsudin, N. M., Abdullah, N., & Yaamat, N. (2013). Strategies of teaching science using an inquiry based science education (IBSE) by novice chemistry teachers. *Procedia Social and Behavioral Sciences*, 90, 583–592. <https://doi.org/10.1016/j.sbspro.2013.07.129>
- Spektor-Levy, O., Baruch, Y. K., & Mevarech, Z. (2013). Science and scientific curiosity in preschool—The teacher's point of view. *International Journal of Science Education*, 35(13), 2226–2253.
- Stronge, J. H., Ward, T. J., & Grant, L. W. (2011). What Makes Good Teachers Good? A Cross-Case Analysis of the Connection Between Teacher Effectiveness and Student Achievement. *Journal of Teacher Education*, 62(4), 339–355. <https://doi.org/10.1177%2F0022487111404241>
- Swarat, S., Ortony, A., & Revelle, W. (2012). Activity matters: Understanding student interest in school science. *Journal of Research in Science Teaching*, 49(4), 515–537. <https://doi.org/10.1002/tea.21010>
- Vosh J. F. and Schauble, L (2014). Is interest educationally interesting? An interest related model of Learning. In K. A. Runniger, S. Hidi and A. Krapp (2014, pp.101–120). *The Role of interest in Learning and development*. New York: Psychology Press.
- Wanzer, M. B., & Frymier, A. B. (2010). The relationship between student perceptions of instructor humor and students' reports of learning. *Communication Education*, 48(1), 48–62. <https://doi.org/10.1080/03634529909379152>
- Weible, J. L., & Zimmerman, H. T. (2016). Science curiosity in learning environments: developing an attitudinal scale for research in schools, homes, museums, and the community. *International Journal of Science Education*, 38(8), 1235–1255.
- Winter, P. & Foster, M. (n.d). Student Engagement and Quality Pedagogy. education.sa.gov.au/sites/default/files/student_engagement_and_quality_pedagogy.pdf?acsf_files_redirect
- Wongkietkachorn, A., Prakoonsuksapan, J., & Wangsaturaka, D. (2014). What happens when teachers do not give students handouts? *Medical Teacher*, 36(9), 789–793.