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Research Article

Scientific Attitude Inventory of Junior High School Students During Pandemic

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ABSTRACT

The study sought to analyze the scientific attitude inventory of junior high school students during pandemic. The scientific attitudes are the most important outcomes of science teaching. It is the combination of many qualities and virtues that is reflected in a person's behavior and actions. The aim of the present study is to check scientific attitude inventory among junior high school students. This study covers 350 students from the different grade levels. Subjects were selected using a stratified random sampling method. Scientific Attitude Scale (SAS) of Bajwa and Mahajan (2012) was administered to collect the data. The statistical treatments that were used in this study are Independent T-test and One way Analysis of Variance (ANOVA) to determine the significant difference assessment of respondents about scientific attitude inventory when grouped according to their profile characteristics. On the other hand, the data statistical treatments that were used to determine the significant relationship of scientific attitude and academic performance is Spearman's Rho Correlation Coefficient. The findings of the study revealed that there is no significant difference between scientific attitude and profile characteristics of the respondents. It also revealed that there is no significant relationship between scientific attitude and academic performance of the respondents. It may therefore be concluded that the scientific attitude of students during pandemic have less in comparison to the normal.

Keywords*: Attitude, attitude inventory, inventory, scientific, scientific attitude, pandemic*

Introduction

Science education is one of the most important channels of knowledge because it is relevant to students' lives and can be applied to use and develop problem-solving and critical thinking skills. These are lifelong skills that enable students to generate ideas, intellectually evaluate decisions, and even understand the evidence behind their decisions. Teaching technology, critical thinking, and problem-solving

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through science classes equips students with the skills and knowledge to succeed in school and beyond.

In recent years, the scientific attitude has been a preference to know and understand, questioning all statements, search for data and their meaning. It is generally accepted that scientific attitudes are the most critical outcomes of science teaching. Through science teaching, certain social ethics and values such as rationality, objectivity, and analytical and critical thinking based on reliable information can be developed in our students. Attitudes are different from the values, beliefs, and opinions of an individual.

Olasehinde & Olatoye (2014) report that the findings indicate a significant positive correlation between science and science, a non-significant positive correlation between scientific attitude and scientific achievement, and a non-significant positive correlation between philosophy of science and scientific achievement. Regarding attitudes toward science, scientific philosophies, and scientific accomplishment, there were few significant differences between the boys and the girls.

However, Amit (2017) came to the opposite conclusion regarding secondary school students' attitudes toward science achievement scores. The results showed that there was a gender difference in the relationship between students' science accomplishment scores and scientific perspective, favoring female students, as well as a strong positive relationship between students' science attitude and achievement scores.

Despite the importance of scientific attitude, few researchers have studied their scientific attitude inventory during pandemics. However, it is not clear whether a scientific perspective can assess their way of thinking and problem-solving. In this article, I argue the scientific attitude inventory of the students to determine their attitudes toward science during pandemics. The present research tries to clarify the current scientific attitude inventory of students during pandemics. The paper aims to document their scientific perspectives to know their impact on the students. This research presents data on how students' way of thinking is based on the scientific attitude inventory. This result indicates that this method is effective in assessing their scientific attitude. The paper is structured as a descriptive scientific attitude regarding rationality, open-mindedness, scientific method, curiosity, and aversion to superstition.

Researchers are really concerned about students' attitudes. It relates to how students comprehend and value descriptive scientific theories in the real world of matter and nature. But more significantly, it shows how they hope to advance science in the future (Tytler & Osborne, 2012). Maintaining positive attitudes and interests in science is the learning objective in most school curricula worldwide. Still, it is also critical to foster students as citizens to respect and appreciate science as part of society's culture (Sjøberg & Schreiner, 2010).

Moreover, Rundgren and Sun (2018) note that attitudes and aspirations serve as indicators of students' future educational decisions. The better we understand what drives student attitudes and aspirations for science, the better educators and policy makers will be able to predict their educational choices and develop early interventions to foster their interest in science careers. educational interventions can be developed.

In addition, adolescence can also be characterized by erratic emotions, boundary-pushing conduct, and the exploration and assertion of one's own identity as well as the learning to manage peer relationships and the move to independence. Early behavioral difficulties are normal and, if ignored, may develop into more serious issues that are unsolvable in adolescence and early adulthood. Sheridan et al. (2019)

In today's society, a scientific mindset is necessary for everyone to live peacefully and meaningfully in a multicultural environment (Gayatri, 2015). When faced with a problem-solving circumstance, scientific perspective keeps habits in mind that influence inclination to act and think in a certain way. Tremp (2013) scientific perspective was assessed in terms of the following: rationality, open-mindedness, scientific method, curiosity, and aversion to superstition.

Given the abovementioned issues and problems, this study explored the scientific attitude utilized by these learners. The research aimed to investigate the relationship of the scientific perspective of the junior high school in terms of rationality, open-mindedness, scientific method, curiosity, and aversion to superstition with the academic performance.

Research Methodology

Research Design

The study used a quantitative type of research, to be specific, a descriptive-survey design. The descriptive-correlational research method was utilized to determine the scientific attitudes among junior high school learners during a pandemic. The purpose of this paper was to associate the profile characteristics of junior high school students and scientific attitudes. To accomplish this, the study utilized a quantitative research approach by deliberately measuring and analyzing the subject variables quantitatively.

Respondents of the Study

The study's subject was three hundred fifty (350) junior high school students in the District of Calumpit, Division of Bulacan, in the school year 2021-2022.

Instrument of the Study

The researcher utilized a standardized instrument for data gathering. For the quantitative probe, the Scientific attitude scale of Bajwa & Mahajan (2012) standardized questionnaire was employed.

The part 1 of the questionnaire is to determine the students' profile; a survey questionnaire was used, including the gender and grade level of the students. While Part 2 is for the assessment of the scientific attitude of the learners

Data Analysis

The collected data were tabulated and processed using the Statistical Packages for Social Sciences (SPSS) Version 23 and Graph Pad In-Stat Version 3. The results were analyzed and interpreted using the Independent T-test and ANOVA as statistical tools to determine the respondents' difference and relationship profile characteristics and their scientific attitude inventory. The Spearman's Rho Coefficient is used to determine the significant relationship between scientific attitude and academic performance.

Result and Discussion

To realize the study's general objectives, the following succeeding tables below present the survey results.

Table 1. Summary of the Average Mean Scores of Scientific Attitude

Scientific Attitude	Ave. Mean	Interpretation
Rationality	3.78	Agree
Open-mindedness	2.93	Somewhat Agree
Confidence in Scientific Method	3.79	Agree
Curiosity	3.81	Agree
Aversion to Superstition	2.51	Somewhat Agree
Grand Mean	3.36	Somewhat Agree

Legend: *1=1.00-1.49(Strongly Disagree) 2=1.50-2.49(Disagree) 3=2.50-3.49 (Somewhat Agree) 4=3.50-4.49 (Agree) 5=4.50-5.49(Strongly Agree)*

As can be observed from the summary presented in Table 1, the scientific attitude of the respondents is somewhat agreed, as evidenced by the grand mean score of 3.36. The result means that the respondents possess a moderate degree of knowledge and idea used in thinking and solving problems. It can also be observed from the same table of the average mean scores of the factors of scientific attitude that curiosity obtained the highest mean score of 3.81 and the lowest 2.51 under the aversion in superstition, which is recorded under

relaxing. On the other hand, the rationality of the respondents is recorded by the average mean of 3.78. In the presence of open-mindedness, the results revealed that they are willing to try new ideas by the average mean of 2.93. While in confidence in the scientific method, the result shows that they have reliability in the scientific method by the average standard of 3.79, respectively.

Table 2. Frequency and percentage on the assessment of the respondents with regards to academic performance in Science

Academic Performance	Frequency	Percentage
Outstanding (90-100)	39	11.1 %
Very Satisfactory (85-89)	140	40 %
Satisfactory (80-84)	156	44.6 %
Fairly Satisfactory (75-79)	15	4.3 %
Total	350	100

As can be observed from Table 2, the assessment of respondents in terms of academic performance in science, most of the respondents are ranging from satisfactory, comprising the frequency of 156 or 44.6% of the total respondents. It is followed by very satisfactory which consist of frequency of 140 or 40 %. While in the outstanding, there are 39 or 11.1% of the respondents and fairly satisfactory there are comprising 15 or 4.3% of the respondents.

Table 3. Composite table of the significant difference between scientific attitude when grouped according to gender profile using Independent T-test.

Gender	F-test Value	Sig p-value	Decision	QD
Rationale	-1.806	0.072	FR	NS
Open mindedness	0.978	0.329	FR	NS
Confidence in Scientific Method	-0.158	0.874	FR	NS
Curiosity	1.290	0.198	FR	NS
Aversion Superstition	-1.897	0.059	FR	NS

Legend: *FR- Failed to reject R- Reject NS- Not significant S- Significant*

Table 3 shows that there is no significant difference in assessing the scientific attitude associated with gender using Independent T-test. It can be gleaned from the table that gender as a determiner of rationality, open-mindedness, confidence in the scientific method, curiosity, and aversion to superstition able to garner an f-value of -1.806, 0.978, -0.158, 1.290, and -1.897 with a significant p-value of 0.072, 0.329, 0.874, 0.198, and 0.059 respectively are significantly higher than the cut-off p-value of 0.05. Therefore, the null hypothesis is rejected. There is no significant difference between scientific attitudes when grouped according to gender profile.

The findings connote that the scientific attitude of respondents, when grouped according to gender profile, has not a significant difference in assessing rationality, open-mindedness, confidence in the scientific method, curiosity, and aversion to superstition.

Table 4. Composite table of the significant difference between scientific attitude when grouped according to grade profile using One Way Analysis of Variance (ANOVA)

Grade profile	F-test Value	Sig p-value	Decision	QD
Rationale	0.974	0.405	FR	NS
Open mindedness	1.331	0.264	FR	NS
Confidence in Scientific Method	0.186	0.906	FR	NS

Grade profile	F-test Value	Sig p-value	Decision	QD
Curiosity	0.880	0.451	FR	NS
Aversion Superstition	2.231	0.084	FR	NS

Legend: *FR- Failed to reject R- Reject NS- Not significant S- Significant*

On the other hand, table 4 shows no significant difference between scientific attitudes when grouped according to grade profile using One Way Analysis of Variance (ANOVA). It can be gleaned from the table that grade profile as a determiner of rationality, open-mindedness, confidence in the scientific method, curiosity, and aversion superstition able to garner an f-value of 0.974, 1.331, 0.186, 0.880, and 2.231 with a significant p-value of 0.405, 0.264, 0.906, 0.451 and 0.084 respectively are significantly higher than the cut-off p-value of 0.05. Therefore, there is no significant difference between the scientific attitude and profile characteristics of the respondents.

Table 5. Composite table of the significant relationship between scientific attitudes and academic performance using Spearman's Rho Coefficients

	Computed r	VI	Sig	Decision	VI
Academic Performance	0.334	MC	0.05	R	S

Legend: *FR- Failed to reject R- Reject NS- Not significant S- Significant, LC – Low Correlation, MC – Moderate Correlation*

As you can be observed in Table 13 presents the relationship between scientific attitude and academic performance using Spearman's Rho Coefficients. It can be depicted that academic performance as a determiner of scientific perspective can garner a computed r-value of 0.334, which denotes moderate correlation and is significant at a 0.05 level of significance. Hence, there is insufficient evidence to conclude an essentially linear relationship between scientific attitude and academic performance because the correlation coefficient is not significantly different from zero. So this null hypothesis is rejected. Therefore, there is no significant relationship between scientific attitude and the academic performance of the students.

In terms of academic performance, Srivastava (2015) studied the influence of scientific interest, scientific attitude, and intelligence on achievement in science at the secondary school level, and it was revealed that achievement in science has a positive correlation with scientific attitude, intelligence, and scientific interest.

Conclusion

From the results above of the study, the researcher at this moment concludes the following:

1. The profile characteristic of respondents does not have significance in their scientific attitudes. Their gender did not signify the role that they may adopt in the holistic development of their scientific perspective. Also, their grade level may not be significant to their capability to solve challenges or problems.
2. The knowledge of scientific perspective suggests an understanding and analyze ideas. Orientation to these attitudes is necessary for every educational institution to promote critical thinking and responsible approaches for learning.
3. The ability to logically thought, understanding differences in continuously changing situations is an essential aspect of a scientific attitude. This concept is relevant to junior high school students since most face problems like pandemics that may conflict with their interests. With this regard, a learner must be equipped and develop a scientific attitude that will help them adjust to how they deal with others and their academic performance.
4. Scientific attitude can be grown by the proper treatment learning. Thus, a need to develop a scientific perspective arises to help them acquire a positive outlook and

beliefs as they make decisions and problem-solve.

Recommendations

Based on the findings and conclusion of the study, the following recommendations are at this moment submitted:

- That the teacher's awareness of the continuously developing of their student's scientific attitude.
- The respondents are provided with programs that will help them be aware of scientific attitudes during a pandemic.
- That scientific attitude continuously develops critical thinking.
- That future researchers involve a large number of respondents in a similar study.
- That future researchers include other profile characteristics such as socioeconomic status and others in their conduct.
- That future researchers investigate other dimensions of the scientific aspect concerning the scientific attitude.

References

Amit Ahuja (2017) Study of scientific attitude in relation to science achievement scores among secondary school students. Educational Quest: An International Journal of Education and Applied Social Science 8(1): 9-16. 11.

Bajwa, S. & Mahajan, M. (2012). Scientific attitude scale. Agra: National Psychology Corporation.

Gayatri, C. G. & Uplane, M. M. (2015). Improving Scientific Attitude Through Problem Solving Activities. Special Issue 2, 89-94.

Olasehinde, K. J., & Olatoye, R. A. (2014). Scientific attitude, attitude to science and science achievement of secondary school student in Katsina State, Nigeria. Journal of Educational and Society Research, 4(1),445-452. https://doi.org/10.5901/jesr.2014.v4n1p445

Rundgren, S.C., & Sun, Y. (2018). A Systematic Review on Age 11-16 Ethnic Minority Students' Attitudes Toward Science and Aspirations for Science Careers.

Sheridan, S. M., Witte, A. L., Wheeler, L. A., Eastberg, S. R., Dizona, P. J., & Gormley, M. J. (2019). Conjoint behavioral consultation in rural schools: do student effects maintain after 1 year?. School psychology, 34(4), pp. 410.

Sjøberg, S., & Schreiner, C. (2010). The ROSE project: An overview and key findings. Retrieved from https://roseproject.no/network/countries/norway/eng/nor-SjobergSchreiner-overview-2010.pdf

Tremp, P. (2013). Research-based Teaching and Learning: A LERU Project. University of Zurich, Munich. University of Alberta. Scientific Attitudes in Action.

Tytler, R., & Osborne, J. (2012). Student attitudes and aspirations towards science. In B. J. Fraser, K. Tobin, & C. J. McRobbie (Eds.), Second International Handbook of Science Education. pp. 597–625.