



BASIC PROCESS SKILLS AND ATTITUDE TOWARDS: INPUTS TO AN ENHANCED STUDENTS COGNITIVE PERFORMANCE.

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ABSTRACT

This study focused on the correlation of mastery in basic process skills and attitude toward Science students' performance. From the 200 respondents 74% or most of the students are normally in the age bracket for secondary students which is 11 to 12. One hundred one (101) respondents or 50.5 % of the total respondents are male while 99 respondents or 49.5 % of the total respondents are female. Although many students are in the ss2 class there are also many students in lower level especially in ss1 who must be aided to improve their skills and performance. The students have homogeneity of "high positive attitude" in all the items in the survey of attitude toward Science except in classroom environment. Many students have "outstanding" performance in Science but there are also many with "Fairly Satisfactory" and "Did not meet expectations" that need immediate attention. In correlation between attitude toward Science and students' performance, only understanding dimension established significant relationship in terms of teaching strategy; all the cognitive process dimensions are not related in terms of academic value; analyzing and creating dimensions are significantly related in terms of Science activity; and understanding, applying and analyzing dimensions are significantly related in terms of classroom environment. iv In correlation between mastery in basic process skills and performance in Science, observing and predicting skills show significant relation with remembering dimension; observing, inferring and predicting skills have significant relationship with understanding dimension; only classifying skill has no significant relationship to applying dimension; communicating and predicting skills are significantly

related to analyzing dimension; only inferring is significantly related to evaluating; and all basic process skills are significantly related to creating. In the light of the aforementioned findings, the following conclusions are drawn: The null hypothesis stating that the mean level of students' mastery of the basic process skills is not significantly related to performance in Science is partially supported. As per indicated in the findings, the null hypothesis stating that there is no significant relationship between students' attitude and performance in Science is partially.

Keywords: science process skills, performance, Attitude, Cognitive.

INTRODUCTION

Science Process skills and attitude toward Science are important elements that may influence students' performance. According to Johnston (2020), science 3 process skills are significant in improving students' cognitive development and facilitating students' active participation during the teaching and learning process Attitude toward science is positively correlated with science achievement (Papanastasiou and Zembylas, 2019). Developing mastery in basic process skills and positive attitude toward Science is aiming for quality students' performance. The students' performance (academic achievement) according to Mushtaq and Khan (2012) plays an important role in producing great leader and manpower for the country thus responsible for the country's economic and social development. The researcher believes that basic process skills mastery and attitude toward Science may affect the performance of secondary school students. This study was conducted to prove the correlation of the aforementioned variables.

STATEMENT OF THE PROBLEM

The basic science process skills are what people do when they do science. Children using the same skills are active learners. They use their senses to observe objects and events and they look for patterns in those observations. They classify to form new concepts by searching for similarities and differences. Orally and in writing, they communicate what they know and what are they able to do. To quantify descriptions of objects of objects and events,

they measure. They infer explanations and willingly change their inferences as new in formations become available. And they predict possible outcomes before they are actually observed (Rezba, et al., 2021). Science process skills form the core of inquiry-based learning. To learn to do science is to master the science process skills and to apply them in scientific investigation (Ngoh, 2018). As cited by Prudente (2019), the deteriorating performance of students in the National Achievement Test (NAT) in Science and Mathematics is already a proof that there is still a problem.

SIGNIFICANCE OF THE STUDY

Science process skills, attitude toward Science and performance of students that plays significant role as source of information during conduct of the study. Related Literature Science Curriculum Guide (2012), states that the K to 12 Curriculum is constructed around the three basic dimensions of the nature of science. The first of these is the science content of our scientific knowledge. The other two important dimensions are, science process skills (SPS) and scientific attitudes and values. All these could be applied in our own locality as well as globally. Skills refer to specific activities or tasks that a student can proficiently do e.g. skills in coloring, language skills. Skills can be clustered together to form specific competencies. De Guzman (2021) iterated that it is important to recognize a student's ability in order that the program of study can be so designed as to optimize his/her innate abilities. Science Process Skills. According to Karamustafaoglu (2019), understanding of Science process usually refer to skills or abilities that must be owned by the scientists on the process of scientific discovery. These skills are divided into two groups: basic and integrated process skills. The basic process skills include observing, asking questions, classifying, measuring and predicting Science process skills are the things that scientists do when they study and investigate. Observing, classifying, communicating, measuring, inferring and predicting are among the thinking skills used by scientists, teachers and students when doing science. Much of the pleasure of both learning and teaching science is experiencing science. Mastering these process skills will help use develop the kind of science program that mirrors real science Bello (2020). Science, according to Handlesman et al., as an academic discipline relates learning the key concepts, as well as the

processes of science. The increasing value of science process skills poses a serious challenge of finding ways to amend teaching as a means of elevating these educational outcomes. Recent revitalization of interest in developing thinking skills has encouraged added importance on process skills instruction. Development of basic process skills is important as well as development of proper scientific attitude and values. Shaping students' attitudes, behaviors, and motivations is necessary today for without these broader skills and strengths, students will be unprepared for the challenges they, and their world, will face (Miller, 2019. Process skills and attitude toward Science are important elements that may influence students' performance. According to Johnston (2020), science 3 process skills are significant in improving students' cognitive development and facilitating students' active participation during the teaching and learning process Attitude toward science is positively correlated with science achievement (Nelly, 2018). Developing mastery in basic process skills and positive attitude toward Science is aiming for quality students' performance. The students' performance (academic achievement)

RESEARCH PARADIGM

The paradigm of the study focused on determining the significant relationship of Basic Process Skills mastery and attitude toward Science with performance of Grade VII students. The research paradigm shows the independent variables which include Science Basic Process skills, namely: observing, communicating, classifying, measuring, inferring, and predicting; and students' attitude toward Science which include teaching strategy; aacademic value; Sscience activity; and classroom Environment. . To measure the students' basic science process skill mastery, a 10-item teacher- made test for each skill with a total of sixty (60) items was constructed. 7 An attitude toward Science survey was also used as a tool to measure how a student thinks and behaves toward science. For the dependent variable the performance of Grade VII students in the Fourth grading period is measured in accordance to the following cognitive process dimensions: remembering, understanding, applying, analysis, evaluating and creating. A 60-item multiple choice test was constructed by the researcher.

Basic Process Skills in Science

- (Observing
- (Communicating
- (Classifying
- (Measuring
- (Inferring
- (Predicting

Attitude Toward Science

(Teaching Strategy
(Academic Value
(Science Activity
(Classroom Environment
Students' Performance
(Cognitive Process Dimensions)
(Remembering
(Understanding
(Applying
(Analyzing
(Evaluating
(Creating

RESEARCH DESIGN

This study utilized descriptive correlation design. Descriptive correlation research can be either quantitative or qualitative. It can involve collections of quantitative information that can be tabulated along a continuum in numerical form such as scores on a test (Knupfer and McLellan, 2001). It involves gathering data that describe events and then organizes, tabulates, depicts and describes the data collection (Glass and Hopkins, 1984). It often uses visual aids such as graphs and charts to aid the reader in understanding the data distribution. Relatively, the study involved gathering of data of respondents and interpreting these data through tables and graphs. The researcher looked into the students' level of mastery of basic process skills and attitude and their mean performance in Science. Respondents of the Study The objective of the study was to measure

Editions

the level of the mastery in basic process skills, attitude toward Science and the performance of the students. 32 The respondents of the study were selected by purposive sampling. Purposive sampling is also known as judgmental, selective, or subjective sampling where a sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study (Crossman, 2017). The two hundred (200) students were selected from the population SS2 students of katsina college katsina one selected school in katsina metropolitan.

RESEACH PROCEDURE

The study involved two phases: constructing the test and survey questions by developing the test and survey forms subject for validation and assembly of the final form. Phase I consists of constructing the survey form and test based on the table of specifications and test domains. Phase II covers field test subjecting the result to appropriate statistical treatment. 35 Students' mastery in science process skills was measured through teacher-adapted test with 60-item, multiple choice type of assessment. Inventory on students' attitude toward Science consisting of 20 items was administered for the purpose of the study. Teachermade test of 60 items was administered to students to assess their performance in the fourth grading period. The tests and inventory were administered to Grade VII students of Sta. Catalina National High School after validation of selected science teachers. Statistical Treatment of Data All collected data were collated for analyses. Appropriate statistical measures were used and employed to quantify the data and to answer the problem set for the study. Descriptive statistics such as frequency count and percent distribution, mean and standard deviation were used to describe the respondents' profile. Frequency count determines the number of respondents who were subjected to the assessment of science process skills. Arithmetic Mean was used to assess students' mastery of basic process skills and performance in science. Mean Percentage Score was used to determine the average score in the Science Process Skill Test and in the Achievement Test. 36 Standard Deviation was used to get the average of how distant the individual scores or perception are from the mean of the tests. Weighted Mean was computed to determine the level of students' attitude toward science. Inferential Statistics of Pearson Product-Moment-Correlation

1. Students may be encourage to raised their levelof performance inscience , from the level of satisfactory to very satisfactory or higher through scieence intervention programs.

2. School support in the areas bof building more rooms science related activities like laboratories, and e-classrooms indeed.

RECOMMMENDATIONS

process skills is not 2. significantly related to performance in science is partially supported .As per indicated in the findings, the nullhypothesis stating that there is no

significant relationship between students attitude aand performmance in

1. The null hypothesis stating that themean levelof student of the basic

In the light of the aforementioned findings, the following conclusions are drawn :

science is partially confirmed

only understanding dimension established significant relationship in terms of teaching strategy ;all the cognitive process dimentions are not related in terms of academic value ;analyzing and creating dimensions are significantly related interms of science activity ;and understanding applying and analyzing dimensions are significantly related interms of classroom environment.

1. The students have homogeinity of high positive attitude in all items in he survey of attitude towards science exceept in classroom environment

2. Many students have outstanding performance in science but there are also manywith fairly satisfactory and did not meet expectations that need

3. In correlation beetween attitude toward science and students performance

- **SUMMARY**

Coefficient was employed to determine the relationship of Scientific Attitude and mastery in basic process skills to performance in Science and their

significance

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immeediate attention.

CONCLUSION

3. Science enhancing and students centered strategies may be applied by science teachers or instructors to improve the performance of students by eemphasizing basic proceess skills and by giving them group activities that need collaborative effort.

REFERENCE

- JOHNSON, A. (2020). The effect of science process skills method on students' academic achievement in science course. *Universal Journal of Educational Research*, 2(1), 37–41. https://doi.org/10.13189/ujer.2014.020104
- Papanastatious and zembylas, I. (2019). Uncovering gender differences in science achievement and attitude towards science for Jordanian primary pupils. *Damascus University Journal*, 21(1), 19-40.
- Mustaq and khan E. (2012). science process skills teaching approach on students' understanding of circle theorems in plane geometry. *African Journal of Educational Studies in Mathematics and Sciences*, *12*(0), 61-74–74.
- Rezba etal ,2021_. *Essentials of educational psychology* (2nded.). New Delhi: Vikas Publishing House, PVT limited.
- (Ngoh,2018.) inquiry-based instruction on students' participation and attitudes in a third grade scienceclassroom. Retrieved from http://etd.fcla.edu/CF/CFE0000530/Arthur_Debbie_J_200505_MEd.pdf
- De Guzman(2021). The effectiveness of guided inquiry-based learning material on students' science literacy skills. *IOP Conf. Series: Journal of Physics: Conf. Series 947.* doi :10.1088/1742-6596/947/1/012049
- Bello (2020). Science processes skills acquisition & relationship thereof with academic level & students' attitude towards the laboratory. *Journal of Studies in Education*, 7(3), 194. https://doi.org/10.5296/jse.v7i3.11562
- Handlesman et.al, Effects of the inquiry-based learning method on students' achievement, science process skills and attitudes towards science: A meta-analysis science. *Journal of Turkish Science Education*, 13(4), 248–261. <u>https://doi.org/10.12973/tused.10183a</u>
- Miller ,(2019) inquiry-based teaching approach on students' understanding of circle theorems in plane geometry. *African Journal of Educational Studies in Mathematics and Sciences*, *12*(0), 61-74–74.