The Scientific Attitudes of Students Major In Science in the New Teacher Education Curriculum

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Abstract - *The study determined the scientific attitudes of the students major in science using descriptive method of research. Data were gathered from 153 science major students using scientific attitude scale as the main data gathering instrument. Science major students are mostly females with majority of second year students. Biology has the most number of enrolment. Majority of the respondents have low income. The level of scientific attitudes of science major students is high in terms of open-mindedness, aversion to superstitions, curiosity and objectivity while moderate in terms of suspended judgment and rationality. The academic performances of the science major students were mostly satisfactory. There is no significant difference between the scientific attitudes of science major students when grouped according to gender, fields of specialization and family income. There is a significant difference between the scientific attitudes of science major students when grouped according to year level. Similarly, academic performance is significantly related to scientific attitudes.*

Keywords: *scientific attitudes, attitudes*

INTRODUCTION

Science, in the curriculum, provides certain scientific values which are not provided by any other subject. The school subjects are taught because they provide liberal education; they are part of the equipment and preparation for life which we expect the school to give to its students so that they may play their part in the community as intellectual citizens. Science is extremely important to one's education just like any subjects offered in school. It provides information and understanding the principles within the facets of living and non-living matters. Supplementary to this, learning science provides the practice of scientific method which develops the scientific attitude, which lead us to think critically and value facts with evidence.

Scientific attitude plays a major role in science education and in the lives of students pursuing science education. This growing awareness of the need and importance of science has become mostly manifested in the Philippines. The basic education curriculum in the country had undergone several changes primarily to address the issues on quality and relevance.

In 2002, the Governance of Basic Education Act of 2001 (RA 9155) was enacted by congress. The enabling law particularly its program known as the Basic Education Restructured Curriculum replaced NESC and NSEC. In both levels, the curricula focused on basic tools subjects of Science, Mathematics, English, Filipino, and Makabayan, which are significant positive steps toward the practical recognition of the importance of science for the Philippines. Science becomes a compulsory subject in the school curriculum, and is trying to inculcate scientific attitude besides preparing the students for leading a quality life.

The government's lack of support for science and technology is well documented, although there have been significant improvements lately. The Balik-Scientist Program, long dormant, has been renewed, hoping thereby to attract overseas-based scientists back to the Philippines. The proposed 2008 budget for the Department of Science and Technology has been significantly increased [1].

In the collegiate level, the Teacher Education Curriculum had also undergone several changes and enrichment that were developed from central office (DECS) and results of experimentation. In 2004, the Commission on Higher Education (CHED) through Memorandum Order No. 30 prescribed the adoption

of the revised policies and standards for undergraduate teacher education curriculum to all higher education institutions, public and private. The BSEEd curriculum aims to develop teachers who can teach different learning areas like Biological Science, Chemistry, Physics, and Physical Science. With the increased number of units and laboratory-based learning activities, it can be viewed therefore, that the New Teacher Education Curriculum fosters the development of the scientific attitudes among students. In view of these growing realizations of the vital importance of science, the result of the countries participation in the Second International Science Study (SISS) and the 2003 Third International Mathematics and Science Study (TIMSS) indicate the weakness of the Philippines in Science. Other countries like Singapore and Thailand have made significant improvements in students' performance from SISS to TIMSS, from among 17 and 43 countries respectively. However, the Philippines consistently remained at the tail end. An analysis was done to determine the problems behind this consistent show of weakness and how the country can improve its capability in Science Education. One of the factors that contribute to the Filipino students' low performance in Science and Mathematics was on science culture [2].

It seemed clear that the key to improve the performance of students in Science is scientific attitude. Without the right scientific attitude, the students will not be given opportunity to develop the favorable traits of human character which will positively contribute to the cultural life of a scientific society.

Formacion [3], cited in his study that prejudice exhibited by most college students towards their physical science subjects have been fostered early in the elementary and high school education. According to him, this can be attributed to poor content background of the teacher, ineffective method of teaching and wrong attitudes of the teacher themselves. One reason teachers do not do better in these areas is that they are unclear concerning the objectives—in terms of behavior— of learning related to scientific attitudes and methods [4]. Hence, the recent years, saw the rise of up-grading seminars, in-service trainings and other programs designed to improve the content background, teaching method as well as to develop correct scientific attitudes.

It was seen that the inclusion of the scientific attitude among the major objectives of the science education can be justified for two reasons: that these attributes which typify the successful scientist and that learning about the nature of learner adopts the same standard toward the world as a scientist; and these attributes are of value to the learner quite independently of his supposed connection with science [5].

Further, objectives proposed for science education always include the development of interests, values, attitudes, aptitudes, and appreciation. The identification of values to be integrated arises from the nature of the discipline and its content. The learning of science concepts and acquiring scientific skills should lead to the development of the scientific attitude-intellectual honesty, respect for the emergence of new knowledge and system in phenomenal patterns, and preciseness and discipline in work performance.

It has also been realized that without developing scientific attitude, any amount of knowledge in science contributes little to national development and to the process of social change. The science program of the College of Education was crafted to fulfill the mission and vision of the Pangasinan State University, as a center of excellence that provides leadership role in high quality education through curriculum enrichment, innovation and values reorientation. Just how well the Science Department of PSU Bayambang achieves what it seeks to achieve, may be viewed in various dimensions, one of which is the development of scientific attitude through science lessons which has been emphasized by science educators. Unfortunately, this important aspect, scientific attitude, of science teaching has not been properly studied by the research workers, hence this study.

There's a need therefore to conduct a study on the scientific attitudes of the science major students in PSU Bayambang to find out if the school system develops open-mindedness and objectivity of intellectual beliefs; encourages curiosity and aversion to superstitions; and awakens students' rational thinking, and at the same time avoids them from having a quick judgment

METHOD
Research Design
The researcher used the descriptive type of research method with the scientific attitude scale as

the main data gathering instrument. This method described the attributes of the Science Majors in PSU Bayambang Campus in terms of their sex, year level, field of specialization and family income. It also described the level of scientific attitude and academic performance of the science majors in all science courses.

This study included the analysis of the difference of scientific attitudes of science majors when group according to sex, year level, field of specialization and family income. The significant relationship between academic performance and scientific attitude was also dealt with.

The Subjects

The total population of the Science Major students of Pangasinan State University, Bayambang Campus was taken as the respondents.

Table 1 shows the distribution of the respondents according to their year level in their respective majors.

Table 1. Distribution of Respondents

Field of Specialization	Year level	Population
Biological Science	II	19
	III	20
	IV	9
Chemistry	II	11
	III	8
	IV	5
Physical Science	II	20
	III	12
	IV	9
Physics	II	12
	III	9
	IV	19
	Total:	**153**

Instrument

The researcher used the Scientific Attitude Scale as data gathering instrument. The instrument was composed of two parts. Part I of the questionnaire dealt with the personal data of the respondents, which included gender, year level, field of specialization and family income. Part II dealt with the Scientific Attitude Scale which consisted of six dimensions: rationality, open mindedness, curiosity, aversion to superstitions, objectivity of intellectual beliefs and suspended judgment. The dimensions of Scientific Attitude Scale were based from previous conducted studies [6], [7], [8], [9].

The SAS was further validated through a dry run to 10 science major students who recently graduated. These Science major students were not included as respondents in the study. The results of the dry run were used in its final form before it was administered to the actual respondents.

The Scientific Attitude Scale was constructed following the Likert method considering its advantages over the other methods. The respondents were asked to indicate their position with regards to each statement by agreement or disagreement to it. More specifically, he encircle "SA" if he strongly agree, "A" if he agree, "N" if he stands as neutral, "D" if he disagree and "SD" if he strongly disagree.

The scoring will be done by providing a 5 point scoring system ranging from 1 to 5.Thus, for each item stating a positive scientific attitude, a "SA" response will be given a score of 5; an "A" response, a score of 4; a "N" response, a score of 3, a "D" response, a score of 2 and a "SD" response, a score of 1. For items of negative polarity, the scoring system was reversed.

The table below shows the distribution of items in the six dimensions of scientific attitudes terms of its positive and negative polarity.

Table 2. Distribution of Items in Terms of Positive and Negative Polarity

Dimension	Positive polarity (item numbers)	Negative polarity (item number)
Rationality	5,13,31	1,32,34,44,45,60
Curiosity	15,23,35,42,46,54	22,37,39,55,18
Open-mindedness	12,16,47,50,57	17,27,29,30,43
Aversion to superstitions	10,24,41,48,52	8,11,19,21,28
Objectivity of intellectual beliefs	25,33,38,40,53	9,20,26,36,58
Suspended judgment	3,14,49,56,59	2,4,6,7,51

Five experts were requested to evaluate the content validity of the instrument. The result of the evaluation of the SAS yielded an average of 4.42 this implied that the instrument is highly valid.

Procedure

The researcher will sought permission from the Dean of PSU, Bayambang Campus to allow her to administer the Scientific Attitude Scale to the Science

Major students of the College of Teacher Education. After the approval, the researcher presented this to the Program Dean of the College of Teacher Education and then to the chair of the Science and Math Department. The researcher sought permission to administer the SAS to the Science Major students in the department.

Data Analysis

To describe the attribute of education students major in Science in terms of their gender, year level, field of specialization and family income, frequency counts and percentages was used.

The computed average weighted mean for each dimension of the Scientific Attitude was interpreted using the following ranges arbitrarily assigned by the researcher: 4.5 - 5: Strongly Agree (SA)/ Very High (VH); 3.5 – 4.49: Agree (A)/High (H); 2.5 – 3.49: Neutral (N)/Moderate (M); 1.5 – 2.49: Disagree(D)/Low (L); 1.0 – 1.49: Strongly Disagree (D)/Very Low (VL).

To find out the level of the academic performance of education students major in Science the General Point Average in all the science subjects taken by the students was considered.

The academic performance of the science major students were based on their general point average in all their science subjects taken up to the first semester of 2009-2010.On the basis of the students' grades, the following descriptions used are as follows: 1.0 – 1.25: Outstanding (O); 1.26 – 1.75: Very Satisfactory (VS); 1.76 – 2.25: Satisfactory (S); 2.26 – 3.00:Fairly Satisfactory (FS); Below 3.00: Unsatisfactory (U).

T – test was computed to test whether there is significant difference between the scientific attitudes of the education students major in science when group according to gender, year level, field of specialization and family income,.

Pearson r was used to determine if there is significant relationship between scientific attitude and academic performance,.

RESULTS AND DISCUSSION

Attributes Of The Education Students Major In Science

This part of the study describes the attributes of the education students major in science of the Pangasinan State University, Bayambang Campus in terms of gender, year level, field of specialization and

family income. These are described using frequency and percentages and are reflected in Table 1.

It can be gleaned from Table 1, that out of the 153 respondents, 54 or 35.3 percent were males and 99 or 64.7 percent were females. This implies that the education students are female dominated. This is due to the teacher education as a course which is more of a female course than male.

Table 1. Attributes of the Science Major Students

Attribute	F	%
Gender		
Male	54	35.3
Female	99	64.7
Year Level		
Second Year	62	40.5
Third Year	49	32
Fourth Year	42	27.5
Field of Specialization		
Biology	48	31.4
Chemistry	24	15.7
Physical Science	41	26.8
Physics	40	26.1
Family Income		
Low	99	64.7
Average	44	28.8
High	10	6.5

It can also be seen from the same table that in terms of year level , 62 or 40.5 percent of the science major students were second year, 49 or 32 percent were third year and only 42 or 27.5 were fourth year. It is noticeable that the higher the year level of the science majors the lesser the frequency and percentage of students. This may be attributed to the selective retention policy of the school.

In terms of field of specialization, almost one third of the respondents were Biology majors as revealed by 48 or 31.4 percent. Forty one or 26.8 percent were Physical Science majors with just one difference as compared to the Physics majors with 40 or 26.1 percent. Only 24 or 15.7 percent were Chemistry majors. This means that among the fields of specialization Biology had the greatest number of students while Chemistry had the least.

As regards to the family income a majority of the respondents belonged to a low income group with. This was revealed by 99 or 64.7 percent. Less than

one third that is 44 or 28.8 percent had an average income. Only 10 or 6.5 percent belonged to a family with high income.

Table 2. Level of Scientific Attitudes of Science Major Students

	AWM	Extent of Agreement	Interpretations
Open-mindedness	3.88	Agree	High
Aversion to superstitions	3.75	Agree	High
Curiosity	3.57	Agree	High
Objectivity of intellectual beliefs	3.47	Agree	High
Suspended judgment	3.22	Neutral	Moderate
Rationality	3.11	Neutral	Moderate
Overall AWM	3.5	Agree	High

The level of scientific attitudes is analyzed in terms of the six components - rationality, curiosity, open-mindedness, aversion to superstitions, objectivity, and suspended judgment. This is categorized into five depending on the extent of the student's agreement. The level of scientific attitude was considered very high if each of the dimensions of scientific attitude was given a rating of "Strongly Agree", high if the rating was "Agree", moderate if the rating was "Neutral", low if the rating was "Disagree" and very low if the rating was ""Strongly Disagree". Table 2, presents the level of scientific attitudes of the science major students in terms of the six components.

One of the six components of the scientific attitude is open – mindedness. An individual possess such an attitude if he respects and listens to the ideas of others, accepts criticisms and changes his mind in the face of reliable evidence contrary to what he believes in.

The data in table 4 obviously reveals that open – mindedness garnered the highest average weighted mean of 3.88, with a descriptive rating as "High". This means that the students are very much willing to learn new things and ideas and are able to revise opinions and conclusions.

Another component in determining the level of scientific attitudes of science major students is aversion to superstitious belief. This refers to the rejection of superstitious and false belief and the acceptance of scientific facts and explanation.

As gleaned from the table, the science major students' extent of agreement was "Agree" and interpreted as "High" scientific attitude. This is supported by an average weighted mean of 3.75.

This means that the respondents are not superstitious. This is not surprising because they are all majors in science and are expected to accept scientific facts and explanations. Moreover, they have the attitude to reject superstitious and false belief.

The above finding is contrary to the findings of Rao et al. [10], wherein they found out that the respondents they used were superstitious. The reason for this is that, they used high school students as subjects, whereas the present study made use of the college students who are majors in science.

Curiosity as a component of scientific attitude is characterized by a desire for understanding situations that are not explained by the existing body of knowledge. It also seeks to find out the "why" and "how" of observed phenomena.

The table shows the level of scientific attitudes of science major students in terms of curiosity. It can be gleaned from the table that curiosity was rated high with a weighted mean of 3.57. It should be recalled that an average ranging from 2.5 – 3.39 corresponds to moderate. This means that the respondents are inquisitive showing a good trait of being a science major student.

A scientist must continually remind themselves to strive for objectivity. Objectivity in science refers to an attitude exhibited by a student who demonstrates the greatest possible concern for observing and recording facts without any influence of personal pride, bias or ambition. He does not also allow any change in interpreting results on the basis of present social, economic or political influences.

The respondent's level of scientific attitude in terms of objectivity was rated as "High" with an average weighted mean of 3.47, also, an extent of agreement as "Agree".

The respondents can suspend judgment if they avoid quick judgment, unwillingness to draw inferences before evidence is collected and unwillingness to accept facts that are not supported by the convincing proof. Such scientific attitude is labeled as suspended judgment.

As gleaned from Table 4, the respondent extent of agreement on suspended judgment is "Neutral" with a descriptive rating as "Moderate".

Rationality refers to an attitude to seek for natural cause of events and identification of cause and effect of relationship. It's also a way of challenging authority and accepting criticalness.

It is seen in the table that the scientific attitudes of the science major students in terms of rationality obtained an average weighted mean of 3.11, which means that the students' extent of agreement is "Neutral". The level of scientific attitudes therefore along rationality is moderate.

The overall weighted mean on the level of scientific attitude was 3.5 which imply that the scientific attitudes of science major students as a whole is high. According to Rao [10], an individual with good scientific attitude can understand the phenomena of nature and human behavior, and accordingly he will behave to prove himself an ideal individual in his own family as well as in the society which he lives.

Table 3. Level of Scientific Attitudes of Science Major Students by Attributes

Attributes	AWM	Descriptive Rating
Gender:		
Male	3.468	Moderate
Female	3.533	High
Year Level:		
2nd year	3.404	Moderate
3rd year	3.500	High
4th year	3.677	High
Specialization:		
Biology	3.465	Moderate
Chemistry	3.492	Moderate
Physical Science	3.523	High
Physics	3.561	High
Family Income		
Less	3.517	High
Average	3.483	Moderate
High	3.557	High

Table 3 reflects the data on the scientific attitude of science major students is described in terms of the four attributes namely: gender, year level, field of specialization and family income.

Males had an average weighted mean of 3.458 which is equivalent to moderate, while the females had a rating of 3.53 which is equivalent to high. This implies that females had better scientific attitudes than males.

The second year students had moderate scientific attitudes as revealed by the average weighted mean of 3.404.Both the third year and fourth year science major students had a high scientific attitudes as evidenced by the computed average weighted mean of 3.500 and 3.677 respectively. Further analysis shows that as the year level of science major increases the average weighted mean computed also increases. This may be due to more exposure to science and experiences gained.

This strengthens the study of Gonzaga [8] that scientific attitudes are positively associated with the number of science units earned in college especially in the junior and senior years.

Of the fields of specialization, Physics garnered the highest average weighted mean of 3.561, followed by Physical Science with a weighted mean of 3.523. Both have a descriptive rating of **high**. On the other hand, Biology and Chemistry also had the same descriptive rating of **moderate** with an average rating of 3.465 for the former and 3.492 for the latter. This implies that Physics and Physical Science majors had a better scientific attitude than Biology and Chemistry major students.

The Science major students belonging to low income group had an average weighted mean of 3.517; the middle income group, 3.483; and the high income group, 3.557. This means that the students belonging to high and low income group had high scientific attitudes while the students belonging to middle income group had only moderate scientific attitudes. Seemingly the family income does not affect the level of scientific attitudes.

Table 4. Level of Academic Performance of Science Major Students

Mean Rating	Descriptive Rating	N	%
1.00– 1.25	Outstanding	0	0
1.26 – 1.75	Very Satisfactory	38	24.8
1.76 – 2.25	Satisfactory	87	56.9
2.26 – 3.00	Fairly Satisfactory	28	18.3
Below 3.00	Unsatisfactory	0	0
	Total	153	100

Table 4 shows the data on the level of academic performance of the science major students in PSU, Bayambang Campus College of Teacher Education in all their science subjects. The academic performance in this study refers to the general point average in their

major science subjects taken, up to the first semester of 2009-2010.

As revealed in the table, majority of the respondents i.e. 56.9 percent or 87 out of 153 performed satisfactorily with a mean rating that ranges within 1.76 - 2.25. Almost one fourth i.e. 24.8 percent performed very satisfactory (1.26 – 1.75) while less than one fifth that is 18.3 percent performed fairly satisfactorily (2.26- 3.00). It is sad to note that nobody had an outstanding performance (1.0 – 1.25). Also, no one had unsatisfactory performance. This reveals that the respondents had not excelled Science; nonetheless, majority of them had satisfactory performance which means that they don't belong to extremes but register on the average.

Table 5 shows the summary of the differences in scientific attitude of the education students major in science across attributes. Only the difference between groups in year level obtain a t- value which had

significant levels lower than .05 as revealed by the significance level of 0.015, 0.000 and 0.000 in each compared groups. The null hypothesis of no significant difference in the scientific attitudes of science major students when grouped according to year level are therefore rejected. This means that the difference in scientific attitudes between second year and fourth year science major students is significant at .05 level of significance.

Further analysis reveals that the scientific attitude of third year is better than second year, and fourth year is better than the second year. Also, the fourth year is better than the third year.

Table 5 also reveals that the hypothesis of no significant difference on the scientific attitudes of science major students when grouped according to gender, year level, field of specialization, and family income is accepted.

Table 5. Differences in Scientific Attitude of the Education Students Major in Science across Attribute

Attributes	Mean	Mean Difference	t-value	Significance
Gender				
Male	3.4676			
Female	3.5328	- 0.6524	- 1.637	0.104
Year Level				
2nd year vs.	3.4038	0.09658	-2.472	0.015*
3rd year	3.5003			
2nd year vs.	3.4038	- 0.27362	-6.923	0.000*
4th year	3.6774			
3rd year vs.	3.5003	- 0.17704	-3.643	0.000*
4th year	3.6774			
Specialization				
Biology vs.	3.4646	- 0.2708	-0.439	0.662
Chemistry	3.4917			
Biology vs.	3.4646	- 0.05859	-1.104	0.273
Physical Science	3.5232			
Biology vs.	3.4646	- 0.09667	-1.104	0.066
Physics	3.5613			
Chemistry vs.	3.4917	- 0.03150	-0.541	0.591
Physical Science	3.5232			
Chemistry vs.	3.4917	- 0.06958	-1.247	0.217
Physics	3.5613			
Physical Science vs.	3.5232	- 0.03808		
Physics	3.5613		-0.757	0.451
Family Income				
Low vs.	3.5168	- 0.03350	-0.808	0.420
Average	3.4833			
Low vs.	3.5168	- 0.03983	- 0.488	0.627
High	3.5567			
Average vs.	3.4833	-0.0733	-0.859	0.395
High	3.5567			

*The mean difference is significant at the 0.5 level

This means that in terms of gender there is no significant difference between the scientific attitudes of males and females. In terms of specialization no significant difference exists in scientific attitudes between and among major students in Biology, Chemistry, Physical Science and Physics.

As regards family income, the compared groups of science major students belonging to different income groups are comparable in their scientific attitudes.

Table 6. Relationship between the Academic Performances of the Education Students Major in Science and their Scientific Attitude as a Whole

Variable	r-value	Significant
Academic performance vs. Scientific attitude	0.232	0.004**

*** Correlation is significant at the 0.01 level*

Table 6 reflects the summary of relationship between the academic performances of the education students major in science and their Scientific Attitudes.

It can be gleaned from table 8 that academic performance of the science majors is significantly related to their scientific attitudes. The computed r − value which is 0.232 had significance level of .05 level of significance. The null hypothesis of no significant relationship between the student's academic performance and scientific attitude as whole is therefore rejected. In other words, there is significant relationship between science major students' academic performance and their scientific attitude as whole. The relationship is positive which implies that the better the scientific attitudes the higher the academic performance.

Table 7. Relationship between the Academic Performances of the Education Students Major in Science and their Scientific Attitude by Component

Academic performance vs.	r- value	Significant
Rationality	0.098	.231
Curiosity	0.238	0.003*
Open-mindedness	0.173	0.033*
Aversion to superstitions	0.065	0.428
Objectivity	0.250	0.002*
Suspended judgment	0.160	0.048*

*The relationship is significant at the 0.05 level

In this study, scientific attitudes include rationality, curiosity, open - mindedness, aversion to superstitions, objectivity, and suspended judgment.

Table 7 presents the summary of the relationship between the academic performance of students and their scientific attitudes by components.

It can be gleaned from the table that of the six components, four are significantly related to academic performance. These are curiosity, open mindedness, objectivity and suspended judgment with an r - value of 0.238, 0.173, 0.250 and 0.160 respectively. All these had significance levels which are lower than .05. The null hypothesis of no significant relationship between academic performance and their scientific attitudes on curiosity, open - mindedness, objectivity, and suspended judgment are therefore rejected.

This implies that there is significant relationship between the academic performance and curiosity, open - mindedness, objectivity and suspended judgment. In other words the more the students are curios, open minded, objective and suspend judgment, the higher their academic performance.

Table 7 also reveals that there are only two components of scientific attitudes that are not significantly related to academic performance. These are rationality and aversion to superstition with an r − value of 0.098 and significant at .231 for the former and an r - value of 0.065 and significant at 0.428. The null hypothesis of no significant relationship between the science majors' academic performance and their scientific attitudes on rationality and aversion to superstition is therefore accepted.

This means that there is no significant relationship between student's academic performance and scientific attitudes on rationality and aversion to superstition. In other words rationality and aversion to superstition do not affect academic performance.

CONCLUSION

The science major students were mostly females. There are more second year students than third year but there are more third year students than fourth year. Biology has the most numbered field of specialization, and chemistry has the least. Most of our science major students belonged to low income group. The level of scientific attitudes of science major students is high in terms of open-mindedness, aversion to superstitions, curiosity and objectivity while moderate in terms of suspended judgment and rationality. As regards to the level of scientific attitudes of science major students by attributes: Females are high while males were

moderate; Third year and fourth year were high while second year was moderate; Physics and Physical Science majors' were high as compared to Chemistry and Biology majors which were just moderate; and the low and high income group had high level of scientific attitude while an average income group had moderate scientific attitude.

The academic performances of science major students were mostly satisfactory. There is no significant difference between scientific attitudes of science major students' when grouped according to gender, fields of specialization and family income. There is significant difference between scientific attitudes of science major students' when grouped according to year level. Academic performance is significantly related to scientific attitudes.

RECOMMENDATION

The high level of scientific attitude of science major students in terms of open-mindedness, aversion to superstitions, curiosity and objectivity may be sustained while the moderate scientific attitude in terms of rationality and suspended judgment may be improved. Males should be given more exposure to activities that would enhance the development of scientific attitudes. The biology and chemistry majors be exposed to more activities that would lead to the development of high level of scientific attitudes. The level of scientific attitudes be increased to improve academic performance. Studies on scientific attitudes of students belonging to other areas of specialization be conducted. Studies maybe carried out to identify factors affecting the lesser levels of possession of scientific attitude in cases of attribute studied in this study. Study on content analysis of textbooks used in the classroom to determine the scientific attitude imbedded in them. Studies on the effect of mode and type of instruction in the teaching of scientific attitude.

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