

# **Science Teachers' Communication Behavior, Lesson Preparation, and Examination System**

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## **ABSTRACT**

Science teachers are facilitators of students' learning. This study investigated the teaching behavior of science teachers in their science classroom as assessed by the college students taking Science subjects in Bukidnon State University, Philippines. Specifically, it sought to determine the science teachers' teaching behavior in the following aspects: 1) Communication Behavior; 2) Lesson Preparation; and 3) Examination System; and identify an action plan that could be suggested means to strengthen the professional development of biological and physical science teachers. The study employed both quantitative and qualitative methods of research. A questionnaire developed by the researcher and the adviser to survey the science teachers' teaching behavior and focus group discussion were used to affirm students' responses and assess other science teachers' teaching behaviors that were not mentioned in the questionnaire. Results showed that college students strongly agree that their science teachers practiced communication behavior at all times. Likewise, the students agreed that their science teachers' teaching behavior in lesson preparation and examination system were practiced most of the time.

**Keywords** - Science Education, science teachers, communication behavior, lesson preparation, examination system, quantitative-qualitative design, Bukidnon, Philippines

## INTRODUCTION

Teachers are highly capable of helping learners express their inner potential. They are highly skilled in understanding what is going on inside themselves and others. Science teachers are also capable of using effective teaching through their creativity to invent engaging learning activities for their students in a little span of time. Teachers' teaching behavior in the classroom could be an external performance of the teaching idea, application of knowledge and teaching skills. Moreover, along the process of education, what is done by teachers plays an important factor. Teachers should transfer the subject matter to the students effectively.

A study on teaching effectiveness was completed by Walberg (1990) using the statistical tool, meta-analysis. His study compiled a list of weighted factors which included engaged academic learning time, positive reinforcement utilization and cues including the feedback, co-operative learning activities, classroom atmosphere, morale, higher order questioning, and use of advance organizers.

For better understanding on how these factors fit together, another study was conducted by Flanders (1970). It showed that the teachers who have positive attitudes toward the world actually employ an important set of facilitating nonverbal cues to encourage student participation and involvement. However, negative attitudes displayed nonverbal behavior designed to discourage and inhibit student involvement (Smith, 1981). Researchers could predict what type of nonverbal behavior a teacher uses if they know the teacher's attitude. Galloway et al. (1977) developed a non-verbal version of Flanders' system of instructional analysis that serves as useful framework for analyzing teacher's nonverbal behavior

Classroom teachers' teaching behavior indicates a strong positive influence and proximity on students' enjoyment in their science classes (den Brok et al., 2005). According to Wentzel (1999), students' attitude associates with their academic achievement. Teachers' classroom behavior influences students' academic performance. Teachers' instructional practices and interpersonal relationships with students in the classroom are highlighted as powerful factors in influencing student motivation and performance.

Teaching behavior in the classroom is one of the issues that teachers face today. Since teachers' behavior is an important factor in learning, it is imperative that both students and teachers work in an atmosphere that maximizes teaching techniques, skills and practices which are conducive to student learning and outcome. Teachers and students become shareholders in the educational processes.

Relations between teachers and students occur rapidly in the classroom. Classroom interaction is a process in which teachers and students have a reciprocal effect upon each other through what they say and do in the classroom. The interpersonal interface between teachers and as a group comprises a large part of what happens in the classroom learning environment. A study of Good and Brophy (1974) indicated that secondary school teachers may have interactions with different students in a day. Teachers are not usually aware on what happened during their interactions with their students. For instance, conversing with the teachers, it is ratified that teachers typically are not conscious on how many questions they have asked their students and what kind of response they delivered.

## FRAMEWORK

To be effective in teaching, cautious and contemplative thought about what a certain teacher is undertaking and the outcome of his or her action on students' social, academic learning is required. The effect can be lasting, both positive and negative on students' perceptions of learning. The behavior of the student is a product of the role and teaching approach/strategy of the teacher. In the same way, the systems theory of communication suggests that the teaching style in turn is a product of, and responds to the classroom interactions that the teachers have with their students (Fisher, Fraser, & Cresswell, 1995).

Bandura (1997) postulated that behaviors are acquired by watching others (the model, teacher, parent, mentor, and friend) who execute the behavior. The performer executes the actions and the learner observes and tries to imitate. Teachers are role models whose manners are easily imitated by the observers, the students. Whatever the science teachers' likes or dislikes give value and how they sense about their learning or studies could have a major effect on their students. However, many teachers seldom realized on how they teach, how they act and behave, and how they relate with students can be more vital than what they impart with them. Teachers' attitudes towards their students directly affect students' attitudes. The way the teachers communicate to their students are in

turn, influenced by their culture and belief system. Teachers' approaches towards their students must be positive enough to carry along the students.

When the students show the expected response, the attached value defines very substantial; the realness of the learning processes in to some extent aspect of education. Akinkuolie and Orifa (n.d.) pointed out that for science teaching and learning to be interesting and stimulating, there should be motivations on both science teacher and the learner so as to ensure the development of affirmative responses, subsequently maximizing academic achievement. Classroom management plays important in the learning and teaching process. Apart from discipline problems, teaching process includes variables of planning learning activities, passing between activities, organizing the physical order of the classroom, preparing the learning materials, and using time-keeping as general order.

Some BSU-college students showed negative feedback expressing their dislikes in the science subject, like "I do not like science subjects," "I am not good in science," "I do not like my science teacher." On the other hand, science teachers also claimed that the students taking natural sciences subjects have very low academic performance; it is evident on the records from the Dean's Office of different colleges. Many studies have been conducted focusing on teacher's classroom behavior, but this study will be focusing specifically on college science teacher's classroom behavior. This study will help teachers employ the appropriate strategies needed to motivate students' participation and enjoy science subjects as such eventually influence their academic performance.

This study centered on BSU-college students at different year levels of science classes. It aimed to investigate the college students' assessment of the teaching behavior of their science teachers in the classroom.

## **OBJECTIVE OF THE STUDY**

This research ascertained the teaching behaviors of science teachers in their science classroom as assessed by the college students taking Science subjects.

## **METHODOLOGY**

### *The Research design*

This study employed both quantitative and qualitative methods of research. The quantitative portion is descriptive which involved a survey on the science teachers' teaching behavior using a questionnaire developed by the researcher and

the adviser. The qualitative part was done through focus group discussion (FGD) to affirm students' responses and assess other science teachers' teaching behaviors that are not mentioned in the inquiry form.

In analyzing the College students' assessment of the teaching behavior of their science teachers, the mean and standard deviation were used. In testing the difference in the teaching behavior of the Science teachers being grouped into Biological Sciences Teachers and Physical Sciences Teachers, the t-test for independent samples at 0.05 confidence level was applied.

### *Research instrument*

The study utilized a research instrument developed by the researcher in collaboration with her adviser to assess teaching behavior of the science teachers. The developed Questionnaire contains 40 items to assess the Classroom Behavior of Science Teachers, the final form of the questionnaire. The respondents responded using a five-Likert scale. The items were arranged into three areas of the science teachers' teaching manners: Communication Behavior in Science Classroom (16 statements); Lesson Preparation (10 statements); and Examination System (10 statements). The questionnaire was tried out to 50-college students. The Cronbach's alpha reliability of the instrument is 0.8373. The responses to the statements range from strongly agree (5) to undecided (1).

### *Research setting*

The study was conducted at Bukidnon State University, first semester for the school year 2010- 2011. Bukidnon State University is located in the capital town of Malaybalay City, Bukidnon. The study was conducted at the College of Arts and Sciences-Natural Sciences Department. The College of Arts and Sciences consists of four academic departments (Language and Letters, Natural Science, Social Science, and Mathematics) and an interdisciplinary studies program. It offers five baccalaureate degree programs namely: the Bachelor of Arts (AB) majors in Economics, Sociology, English, and Social Science; and Bachelor of Science in Mathematics.

### *The Respondents*

Using the proper protocol, the researcher asked permission to administer the instrument to the respondents through a letter of request from the President of the University and the Dean of Graduate School. Appropriate communications were also given to the Arts and Sciences Dean, Natural Science Department Chairperson and respective science teachers preceding the actual conduct of the

research instrument.

The researcher personally administered the research instruments to the respondents to ensure 100% retrieval. The respondents were oriented as to the intent of the whole study. Clarification to the respondents on answering the instrument was explained thoroughly by the researcher. They were given 10 minutes to answer the questionnaire. The respondents were given enough time to reflect about their personal evaluation. They were reminded that there is no right or wrong answers for the latter questionnaires. Assurance was given to the respondents as to the confidentiality of their responses as well as their identities.

The respondents of this study were college students taking discipline in the Natural Sciences Department in the College of Arts and Sciences of Bukidnon State University for the school year 2010- 2011. There were 5,002 students who are enrolled: 2,179 for physical sciences and 2,823 for biological sciences.

Most of the college students studying in Bukidnon State University were from the different places in Bukidnon. Majority of them are graduates from the diverse government high schools spread in major cities and municipalities of the province. A good number of these students were children of government employees or farmers which mean that a greater part of the population comes from the middle and/or lower class of the society.

Table 1. Sample Respondents from students taking Natural Sciences subjects

Cluster	Natural Sciences Subjects	Number of Classes	Number of Samples (classes)	Number of Students
<b>A</b>	<b><i>Physical Sciences:</i></b>			
	General & Inorganic Chemistry	9	1	50
	Introduction to College Physics/ Physics for Health Sciences	21	1 1	50 50
	Earth Science	13	1	50
	Astronomy	4	1	50
<b>Total</b>		<b>47</b>	<b>5</b>	<b>250</b>
<b>B</b>	<b><i>Biological Sciences:</i></b>			
			1	50
	Introduction To Biological Sciences	55	1 1 1	50 50 50
	Environmental Science	12	1	50
			1	50
	<b>Total</b>		<b>67</b>	<b>7</b>

## RESULTS AND DISCUSSION

The study of Welton et al. (2000) supported the results of the present study that carefully organized lessons engage students in what they perceived to be “real science,” thereby reducing reliance on structured behavioral management techniques. Oliva and Pawlas (2007) pointed out that group participation is essential in effective discussion. Teacher should vary stimuli and learning activities as suggested by Allen (1967). Teachers should focus (keep points in mind), use interactional styles, shift sensory channels and use skills of movement, questions and pausing. Providing variation of learning activities moves teachers in the direction of providing individualized instruction that taps the learning styles of students.

Table 2. Comparison of the ratings on the teaching behavior of Physical Sciences Teachers and Biological Sciences Teachers as assessed by their students

Indicator	Physical Sciences Teachers	Biological Sciences Teachers	t-value	P-value	Significance
	Mean Values				
Communication Behavior	4.26	4.26	-0.231	0.818	Not Significance
Lesson Preparation	4.06	4.03	0.836	0.404	Not Significance
Examination System	4.16	4.17	-0.158	0.874	Not Significance
Overall	4.16	4.15	0.546	0.732	Not Significance

Based on the comparison of the ratings on the teaching behavior of Physical Science Teachers and Biological Science Teachers as assessed by their students, the findings mean that there is no difference in the teaching behavior between the Biological Sciences Teachers and the Physical Sciences Teachers. Both groups of students (those taking Biological Sciences and those taking Physical Sciences) have similar observations on the teaching behaviors of their Science Teachers. This means the Biological Sciences Teachers and the Physical Sciences teachers did not differ in their practice of teaching behavior in their sciences classes. The high ratings are given by both groups of students on the teaching behavior of their respective science teachers would show that the students have high regards of the teaching behavior of their science teachers.

There are still areas in the teaching behavior of the science teachers that need to be improved and competencies to be enriched. The researcher proposes an action

plan with this regard. This study investigated only the Science teachers' teaching behavior in their classroom particularly in their communication behavior, lesson preparation and examination system as assessed by the college students taking Science subjects.

## CONCLUSIONS

In the present research, the study of Zoller et al. (1997) and Craft (2012) have semblance in terms of the variables as the subject respondents and the statistical tools used in the treatment of data. It can be inferred that students have *strongly agreed* to the communication behavior of their science teachers. However, the students *agreed* on their science teachers in lesson preparation and examination system as *agree*.

Moreover, since the college students have given high rating on the assessment of their Science Teachers' teaching behavior, the college students have high regards of their Science Teachers' teaching manners.

## TRANSLATIONAL RESEARCH

The results of this study will motivate the College Science students to participate and enjoy, and appreciate the importance of science lessons. It will also allow them to have an access on different science teachers' teaching behavior in communication behavior which will provide them ideas on different interpersonal science teachers' teaching behavior and consider the multi-task individual; lessons preparation which will expose them to different science lessons techniques and presentations; and examination system, which will endow them to different science examination systems.

For the faculty members of Natural Sciences Department, the results will provide information considering science teachers' teaching behavior as a criterion in hiring Science teachers. It will also develop the standard of teaching performance of the department's faculty members.

For the College Science teachers, the results will suggest a deeper insight on the kind of dealings in terms of communication behavior, lesson preparation, and examination system that they will have to their science students. It will also give them reflections in dealing with different behaviors of science students in such a way that they will be able to carry out those behaviors as front liners of education. Thus, knowledge transfer will be maximized.

For the Science Education Program, the results will suggest variables that can be studied further to improve the teaching performance of the science teachers in communication behavior, lesson preparation, and examination system as well as the academic performance of science students.

For the Administrators, the results will help them monitor the policies and programs that could affect the interest of students in learning science.

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