

The Influence of Instructor Effectiveness on Learning Outcomes in Natural Science

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ABSTRACT

Effective science instructors can easily form a bridge between the learner and the subject matter to facilitate learning that link the learner into a science oriented society. Instructors are a chief input into the higher production process. A poorly prepared teacher can hamper the effectiveness of any carefully selected and well-organized instruction through indifferent and negative attitudes. This study aimed to assess the instructors' effectiveness of instruction in terms of: commitment, knowledge of the subject, teaching for independent learning, and management of learning. Results showed that instructors' effectiveness in terms of commitment, knowledge of the subject, teaching for independent learning and management of learning are important determinants of students' performance. Overall findings suggest that further studies pertaining to qualities of effective instructors as perceived by university students be conducted to enhance teaching and learning in higher education.

KEYWORDS: Instructors' effectiveness; performance; natural science; instruction; commitment.

1. INTRODUCTION

Teaching and learning science is quiet difficult and challenging. Though it is one of the essential knowledge where everyone must know but only few deserves to make it. Science is one of the most learning areas in all levels of educational endeavor which require upgraded and effective teaching expertise especially on the side of the instructors. In this account educational success and satisfaction of every learner depends upon the quality of instruction and application given by the instructors. Being engaged with this situation, science instructors must have their own conviction and optimistic in facing while striving.

Effective science instructors can easily form a bridge between the learner and the subject matter to facilitate learning that link the learner into a science oriented society. This strategy can mold the learners' attention and active participation with the belief that he or she is actually involved not only in the subject matter but as an active living individual. Reference [15] emphasized that instructors are a chief input into the higher education production process, yet we know very little about their role in promoting student success.

A poorly prepared teacher can hamper the effectiveness of any carefully selected and well-organized instruction, through indifferent and negative attitudes. On the other hand a professionally prepared teacher can use and adequately structured curriculum to build an instructional program of the significance merit.

Reference [9] revealed that competency in using varied studies is the main role of a teacher to facilitate student learning. This role of the teacher calls for the proper application to teaching methods to make the learning experiences meaningful. In performing this role, the teacher has to bear in mind that there is no single perfect approach to teaching which help student learn everything in every way.

Effective instruction for the students is necessary to make learning effective and students' performance also improve. The teacher must discover also point of reference that would consequently bring about the desired outcomes in science so that he can improve greatly the students to make necessary measure to correct the defects. The result of the study conducted by reference [2] showed that an effective university instructor is one

who respects students as people, recognizes their identity, listens to their concerns and challenges, and is someone students can depend on for support when needed. As cited by reference [15]two recent studies have concluded that instructors play a larger role in student success. Bettinger, Fox, Loeb and Taylor [5] examine instructor effectiveness using data from DeVry University, a large for-profit institution in which the average student takes two-thirds of her courses online. They find a variance of instructor effectiveness that is substantially larger than prior studies in higher education.

Reference [30] emphasized that teacher must develop their own style and teaching techniques based on their own physical and mental characteristics. Good teaching skills, [36] argue personal traits are equally important in learning process. Teachers, he further adds, to create an environment that is conducive to learning, should assign time to build rapport in the classroom.. Being effective cannot be characterized merely by one's professional knowledge and teaching skills obtained through formal training of a certain duration [1].

According to reference [23], effective teaching is related to the relationship between teachers and students. To Broddie [8], a teacher can be regarded as effective to the extent that she or he helps students achieve educational goals. To define effective teachers, researchers have also used adjectives such as enthusiastic, charismatic, and expressive [23, 38], ideal, analytical, dutiful, competent and reflective [13].As cited by Stronge [35], as a teacher's overall influence is far reaching, it is difficult to define what outcomes lead to effectiveness and how these outcomes be measured.

Reference [16] cited that there is a substantial body of research showing that teacher quality is an important determinant of student achievement in elementary and secondary schools, inspiring some states and districts to enact policies aimed useful at identifying and rewarding high –quality teachers. Yet relatively little is known about the impact of instructor effectiveness on student performance in higher education, where such insights could be particularly useful.It is in this context that the researcher is in search of empirical data to serve as basis in determining instructors' effectiveness as it relates to students' performance.

1.1 Objectives of the study

This study aimed at assessing the instructors' effectiveness in relation to students' performance in Natural Science. Specifically, 1.) Determine the performance of the students in Natural Science; 2.)determine the instructors' effectiveness of instruction in terms of: 2.1) Commitment, 2.2) Knowledge of the Subject, 2.3.) Teaching for Independent Learning, and 3.4.) Management of Learning; 3.) as certain the significant relationship between students' performance and instructors' effectiveness in instruction.

1.2 Framework of the study

Theoretical Framework. The theoretical framework of the study is anchored on the theory propounded by different authorities. The theory of Stodolsky [34], emphasized that goals and objectives in Mathematics necessitates improved methods of teaching and an upgrading in terms of activities and the new goals and the content in Mathematics instruction in the secondary schools required a corresponding improvements in methods of teaching.

Reference [29] stressed that the educational psychology attempts to assist the teacher in managing the learning situation by showing what happens when learning takes place and puts the emphasis on learning rather than teaching. What happens to the learner is important of what kind of guidance or the teacher provides assistance. This does not mean that the teacher is not essential; it means that his role is that of guiding and directing the learners.

Yohalem & Pittman [37] cited that a critical ingredient of high performing, high poverty school is a school culture in which teachers, administrators and systems are committed to the success of each and every student. An environment of "No excuse instruction" where educators accept neither poverty nor race, nor a young person's attitude towards learning as reasons for not engaging them, is critical to our success transforming high schools to meet the needs of vulnerable youth.

Reference [30] stated that a teacher should utilized space in classroom and whatever instructional materials find pleasure in the study of Mathematics and whatever method should they used to catch the interest of the learner. Teachers' effectiveness in instruction is due to his/her deep background or knowledge of the subject, highest educational attainment and careful analysis of his job to improve the students' performance. Educational qualification of the teacher is also a great factor to improve instruction.

Mathematics is generally perceived as a difficult subject and students with attitudinal and motivational problem tend to become less involved in this area. Salandanan et.al [32] stressed that a mathematics teacher recognizes two problems in the teaching of mathematics. The first is to provide student mathematical experiences suitable to the state of their existing concepts. The second is to develop students to analyze new materials themselves so that they can synthesize their own concepts in ways most meaning for them independently of the teacher.

Reference [26] asserted that teaching is essentially a communication process. In the past, teaching depended entirely on verbal communication. Although this kind of communication process continuous to play an important role in the teaching process, current educational practices recognizes the value of growing number of instructional materials as aids to effective communication and in turn to effective teaching and learning.

Lanier and Little [24] claimed that traditional lessons are less likely to promote conceptual understanding or facilitate conceptual change and thus are less likely to promote the development of technical skills. Therefore,

teachers’ competencies and knowledge in both biology as a discipline and its teaching for enhancing student’s learning.

Reference [39] asserted that teacher-centered or traditional lessons are non-productive and in some cases detrimental to student learning.

There are a number of challenges to measuring effectiveness in the context of higher education. For many reasons, the challenge of evaluating college instructors is more akin to the problem of rating physicians[33]. There is also evidence that gender and racial math between students and instructors influences students’ interest and performance [7; 21; 19;]. Finally, Hoffmann and Oreopoulos [20] find that students’ subjective evaluation of professors is a much better predictor than objective professor characteristics such as rank. This echoes the finding of Jacob and Lefgren [22] that elementary principals can identify effective teachers, but that observed teacher characteristics tend to explain little of teacher effectiveness.

Teachers play a pivotal role in the learning process [27].Regardless of the subject matter, teachers play a pivotal role in constructing and shaping educational practices at all levels. It is the teachers who help educational practices function efficiently and enhance learning process, thereby affecting students’ academic achievement from the very first hand [10; 31; 25]. Teachers are powerful figures and can have long-lasting influence on students. They play an important role in what, how, and how much students learn [3; 35].

Conceptual Framework. The schema in figure 1 presents the conceptual framework of the study

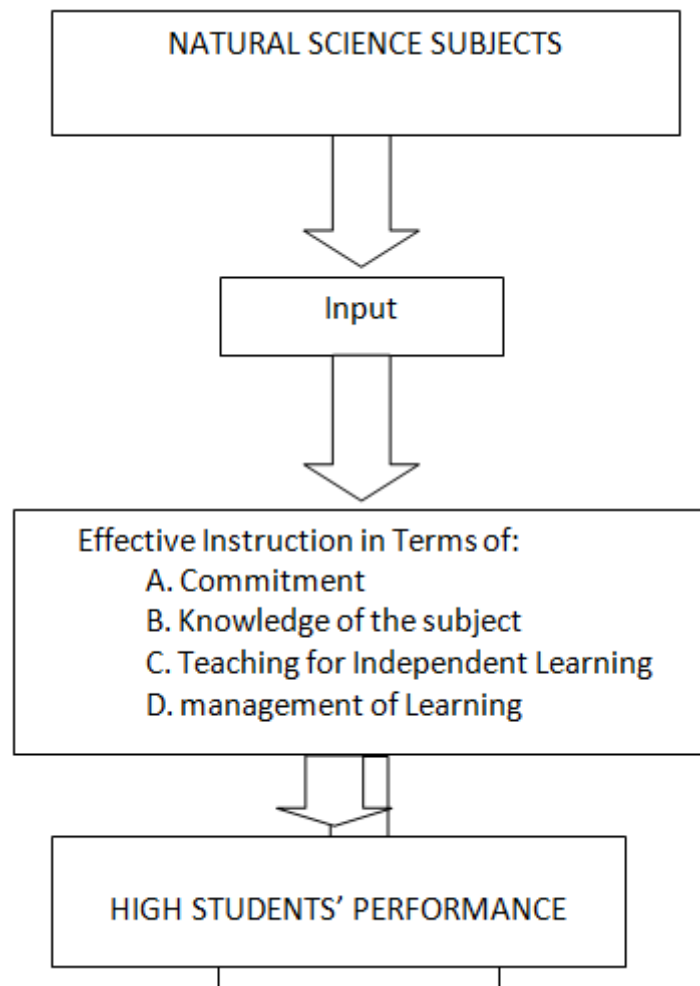


Figure 1. Conceptual Framework of the Study

2. METHODOLOGY

The descriptive method was used in this study; this was conducted at Biliran Province State University(BiPSU)-Biliran Campus as its setting with 86 student population, school year 2017-2018 . The data on effectiveness of instructors were obtained by using the questionnaire in Strategic Performance Management System(SPMS) for

faculty members rated by the students, as certified by Quality Management System (QMS). Distribution and retrieval of the questionnaires was done personally by the researcher. The grades of the students taking Natural Science subjects were taken by the researcher in the grading sheets from the office of the Registrar. Data were analyzed using the statistical package for Social Sciences (SPSS).

3. RESULTS AND DISCUSSION

3.1. Table 1 shows the distribution of respondents

The respondents were eighty-six(86) students officially enrolled in school year 2017-2018. 42 or 48.8% were male and 44 or 51.2% were female.

Table 1. Distribution of Respondents by Sex

Sex	Frequency	Percent	Valid Percent	Cumulative Percent
Male	42	48.8	48.8	48.8
Female	44	51.2	51.2	100
Total	86	100.0		

As reflected in the table, female students were slightly higher in number than the male. This shows that the student’s choice of course or specialization is not primarily based on sex or gender orientation.

Table 2. Distribution of Respondents by Course

Course	Frequency	Percent	Valid Percent	Cumulative Percent
BSA	56	65.1	65.1	65.1
BEEEd	25	29.1	29.1	94.2
BSFT	5	5.8	5.8	100.0
Total	86	100.0	100.0	

As presented in the table, a greater number of the students or 65.1% took Bachelor of Science in Agriculture. Next is the Bachelor of Elementary Education with 29.1% and the least is the Bachelor of Forestry with only 5.8%. BSA obtained the highest number of student-enrollees considering that the flagship program of the university is in agriculture.

Table 3. Distribution of Final Grades

Grades	Frequency	Percent	Valid Percent	Cumulative Percent
Failed	11	12.8	12.8	12.8
Conditional	9	10.5	10.5	23.3
Poor	11	12.8	12.8	36.0
Fair	20	23.3	23.3	59.3
Good	18	20.9	20.9	80.2
Very Good	12	14.0	14.0	94.2

Outstanding	5	5.8	5.8	100.0
Total	86	100.0	100.0	

As provided in the table, most of the students obtained grades within the bracket ‘Fair’ and ‘Good’ at 23.3% and 20.9%, respectively. Only few had attained ‘Outstanding’ grades at 5.8%. The findings imply that the academic performance of students is on the average level as attributed to the number of those in the ‘Poor’ and ‘Outstanding’ groups.

Table 4. Instructors’ Commitment

Interpretation	Frequency	Percent	Valid Percent	Cumulative Percent
Poor	2	2.3	2.3	2.3
Unsatisfactory	25	29.1	29.1	31.4
Satisfactory	41	47.7	47.7	79.1
Very Satisfactory	14	16.3	16.3	95.3
Outstanding	4	4.7	4.7	100.0
Total	86	100.0	100.0	

Evidently, majority of the respondents at 47.7% found the Instructors’ commitment satisfactory. Nearly 30% were unsatisfied while only a little of the respondents at 2.3% regarded Instructors’ commitment as poor. The other 4.7% believed that their Instructors’ commitment is outstanding. From the given results, it could be inferred that the Instructors’ commitment is on the average level and there is still a huge room for increasing their commitment, which implies that the greater their commitment to teaching the higher is the impact to students’ learning and performance.

Table 5. Knowledge of the Subject

Interpretation	Frequency	Percent	Valid Percent	Cumulative Percent
Poor	3	3.5	3.5	3.5
Unsatisfactory	16	18.6	18.6	22.1
Satisfactory	40	46.5	46.5	68.6
Very Satisfactory	23	26.7	26.7	95.3
Outstanding	4	4.7	4.7	100.0
Total	86	100.0	100.0	

The data reveals that nearly one-half or 46.5% of the respondents believed that the Instructors’ knowledge of the subject is satisfactory. Nearly one-fourth or 26.7% agreed that the Instructors have very satisfactory knowledge of the subject. Only small portions rated the Instructors poor and outstanding. Results imply that the instructors have yet to work on equipping themselves to increase their capability in teaching the subject. That is, the more knowledgeable and competent the instructors in teaching the subject, the better the learning outcomes of the students will be as well as the school performance.

Table 6. Teaching for Independent Learning

Interpretation	Frequency	Percent	Valid Percent	Cumulative Percent
Poor	1.2	1.2	1.2	1.2
Unsatisfactory	20	23.3	23.3	24.4
Satisfactory	46	53.5	53.5	77.9

Very Satisfactory	14	16.3	16.3	94.2
Outstanding	5	5.8	5.8	100.0
Total	86	100.0	100.0	

As provided in the table, majority of the respondents or 53.5% rated the Instructors 'satisfactory on 'teaching for independent learning'. A little more than one-fourth or 23.3% agreed that the Instructors were very satisfactory in this aspect of teaching. Only a little of the respondents or 1.2% and 5.8% believed that the Instructors were poor and outstanding, respectively. These findings could mean that the ability of the Instructors teaching for independent learning still needs to be enhanced and they too upgrade their teaching modalities to be able to cope with the increasing demand of quality teaching and learning, resulting to an improved school performance.

Table 7. Management of Learning

Interpretation	Frequency	Percent	Valid Percent	Cumulative Percent
Poor	2	2.3	2.3	2.3
Unsatisfactory	21	24.4	24.4	26.7
Satisfactory	43	50.0	50.0	76.7
Very Satisfactory	18	20.9	20.9	97.7
Outstanding	2	2.3	2.3	100.0
Total	86	100.0	100.0	

The table shows that one-half of the respondents or 50% rated the Instructors 'satisfactory' in terms of their 'management of learning'. More than one-fourths or 24.4% and 20.9% thought of the Instructors as 'unsatisfactory' and 'very satisfactory'. Only 2.3% of the respondents rated the Instructors for both 'poor' and 'outstanding'. Hence, the data suggest that the Instructors could still reinforce themselves teaching-wise and may enrich their teaching capability and competence to be better, if not outstanding, in management of learning.

Table 8. Relationship Between Teaching Performance of Faculty Members and Academic Performance of Students

Variables	R	p value	Interpretation	Decision
Teaching Performance of Faculty Members	.699		High Positive Correlation	
Academic Performance of Students		.000	Correlation is significant at 0.01 level	Null hypothesis of no significant relationship cannot be accepted

As regards the relationship of variables, it was found out that a significant relationship existed between the Science Instructors' teaching performance and students' academic performance. With a p-value of .000 at 0.01 level of significance, the null hypothesis was rejected and therefore the Science instructors' teaching had greatly affected or influenced the students' academic performance.

4. CONCLUSION AND RECOMMENDATIONS

Conclusion

This study attempted to explore the instructors' effectiveness in relation to performance in Natural Science. Based on the findings it can be concluded that instructors' effectiveness in terms of commitment, knowledge of the subject, , teaching for independent learning and management of learning are important determinants of students' performance and that students' performance is associated with instructors' effectiveness in instruction.

Recommendations

Based on the findings and conclusion of the study, the following recommendations are hereby offered for consideration: 1.) Different strategies of teaching must be used in order to stimulate and facilitate good learning of the students; 2.) Instructors handling natural science subjects should design and apply more realistic approach in evaluating students; 3.) Instructors should continually attend in-service training, develop team teaching and find a ways or means suited to the improvement of students' performance; 4.) Instructors motivation should be improve to arouse the interest of the students in the subject, commitment to evaluate the performance of students objectively and involvement in students to facilitate and enhance effective learning situation; 5.) Special classes and remedial instruction can be made for the low performers in order to improve students' performance in natural science subjects; 6.) Natural science instructors' should be closely supervised so that proper and effective instructions will be implemented in order to improve students' performance; 7.) Personnel policies for recruiting effective instructors may be a key, yet underdeveloped, tool for improving institutional productivity; 8.) Students must have to find a way to improve further their ability and performance in natural science and other interrelated concept obtained by self-study, self-motivation, self commitment, learning attitudes, study habits, and learners' involvement in the teaching activities; 9. Students evaluation of teaching effectiveness must be kept and increasingly adopted as one indicator in quality control; 10.) Future research in instructors' effectiveness using data from other universities possibly produce more interesting findings; and 11.) Further studies pertaining to qualities of effective instructors as perceived by university students be conducted so that results can be used as guide for recruiting new faculty. It can also be used for developing professional development programs. Data about the qualities that make university teaching effective are important in the efforts to enhance teaching and learning in higher education.

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