PHYSICS INSTRUCTION AND TEACHING PERFORMANCE IN TERTIARY EDUCATION: CAGAYAN STATE UNIVERSITY'S SETTING

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Article History: Received: 25.03.2023 **Revised:** 18.05.2023 **Accepted:** 26.06.2023

Abstract

This study on the Physics Instruction and teaching performance in Cagayan State University aimed to know if there is relationship between them.

Specifically, this study was proposed to answer how professionally qualified are the Physics teachers with reference to highest educational attainment, years in service, years in teaching Physics, in-service trainings related to Physics, performance rating, how far the learning objectives were emphasized, the extent to which the teaching strategies were used and the consistency of the evaluation with the learning objectives and problems met by the teachers on the nature of students, instructional facilities and administrative support.

The study also looked into the problems encountered by the teachers in terms of the nature of students, instructional facilities and supervisory support.

Physics teachers in all the campuses served as respondents in the study. Descriptive statistics like frequency counts, percentages, mean and weighted mean were employed to analyze pertinent data regarding the educational qualification of the respondents in relation to teaching experience, in-service trainings, faculty rank and performance rating. Finally, Pearson-R was used to determine the relationship of the Physics instruction and the teachers' teaching performance.

Results of the study revealed that the Physics teachers in the Cagayan State University are qualified to teach Physics courses in the University. Most of them are masters' degree holders in Physics/Physics Education. Some finished MAT-Physics and MTE-Physics. From the group, three (3) are earning units in the Doctoral program already. The respondents occupy academic ranks that are consistent with the educational qualification they are holding during the conduct of the study.

Significant relationship was revealed from the findings on the 1) frequency of use of the teaching strategies, and 2) problems met on the nature of students, instructional facilities and supervisory support.

Finally, findings unfold that there exists no significant relationship between Physics instruction and teachers' teaching performance.

Keywords: Professional Advancement; educational landscape; short term; long term; policies; faculty.

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DOI: 10.31838/ecb/2023.12.s3.776

1. Introduction

Today's educational landscape especially in tertiary education has dramatically changed due to changing demands in the employment market locally as well as globally.

In fact, too many changes have been introduced in the Educational System. Innovations one after the other have been tried but despite these efforts, the system is still wanting in improvement to really meet educational demands. At present, there is a call for education 4.0 which exemplifies a technique of learning that is connected with the fourth industrial revolution[1]. It requires dynamism in the educational system in order to respond effectively to the call for quality graduates, ready to face the global workplace with confidence. As such, education goals have evolved to emphasize student acquisition of the knowledge and attributes necessary to successfully contribute to the workforce and global economy of the twenty-first Century. The new education standards emphasize higher end skills including reasoning, creativity, and open problem solving[2].

Institutions of learning are the most potent venue where dynamic and intersectoral process of unearthing and nurturing the learners' potentials and capacities for acquiring essential knowledge, skills and attitudes take place. At the helm of this growth and development are the "teachers" whose mission is to help the learners become productive members of the society. Into their hands lie the great responsibility of producing thinking, working and compassionate humans who are cognizant of their basic rights and responsibilities.

Like the might of a pen, teachers can make and unmake students who are under their care. Their commitment towards teaching and the learners can spell the success or failure of the educational thrusts of the decade. No amount of revisions in the system can produce quality education which has been aspired for, if no change in the teachers take place.

This makes the role of teachers more expansive but schools are large and complex institutions that like business enterprises, require good managers. Hence, practical and doable strategies for reforming and restructuring higher education are proposed by the Commission on Higher Education (CHED). These are directed to the three players in the education sector – the students, the teachers, the schools and the government – and aimed at creating fair, flexible and efficient transactions among them. When these objectives are achieved, the country's higher education system will adapt to any kind of socio-economic environment. In one study, it was found out that there was a significant difference in the performance of secondary school physics students taught by teachers with high qualifications compared to those taught by teachers with low qualifications[3]. Moreover, some of the identified factors that reduced students' physics achievement were ineffective teaching method, low motivation towards learning physics, lack of facilities and laboratory equipment to facilitate physics learning and teachers' content knowledge of physics[4]. Notably however, there is incomplete information about the quality and nature of management of colleges and universities.

Schools need encouragement in achieving excellence through enforcement of minimum standards, and assistance for management training. Universities and colleges must be guided regarding the quality of instruction which they are to aspire. According to the CHED, state colleges and universities should upgrade higher education disciplines along the areas of science and technology, engineering, teacher education and other priority areas in accordance with national development needs.

The need to produce more competent scientists and technology-based skills and the continued fast-tracking of the improvement of science and technology foundations of young Filipinos appear to be key ingredients in the institution building and human capital enhancement efforts.

Schemes of development should be implemented to identify key institutions in the priority areas such as science and technology, engineering, teacher education, maritime and agriculture.

The CHED further stressed that SUCs should achieve and institutionalize a culture and quality of excellence in higher education institutions and programs through the implementation of higher requirements and standards of quality in all aspects of the higher education system such as the inputs, processes and outputs.

Resources on areas in higher education that will enable the country to attain global competitiveness and world class manpower should be given utmost consideration.

The emerging trend towards global competitiveness and high-quality service; the shift to the development of high value-added undertaking and the greater applications and relevance of the avenues and highways of information will ensure the pressure to produce quality results. Products from higher education institutions will continue to be a critical concern of the commission on higher education both in the short and medium terms. The basic issues addressed in this area will revolve around the quality of academic requirements, students' entry qualifications, monitoring and evaluation processes, quality profiles of institutions, and supervision and regulation of schools.

Teachers' qualification for undergraduate programs should be a master's degree while a doctorate degree for graduate programs or its equivalent such as distinction in related fields of research or creative work. In addition, monitoring mechanisms are very important such as periodic assessment of the

teachers and evaluating their professional development as among the bases of their promotion. The Cagayan State University being one of the State Universities and Colleges in the Philippines is mandated to carry out the same educational thrusts. However, its success lies to a great extent on the shoulders of the learning conveyors – the teachers. And while some of them may be able to adapt immediately to the change, others might find it difficult. It is in this regard that the researcher is pushed to conduct a research along this concern in order to obtain information that are useful for institutional policy review.

Statement of the Problem

This research aimed to evaluate the relationship of the teachers' performance with the Physics instruction in the Cagayan State University.

Specifically, it aims to answer the following questions:

1. What is the attitude of the teachers towards Physics teaching?
2. What learning objectives do the Physics teachers emphasize in their teaching and testing?
3. How frequent do the Physics teachers use the following strategies?

a. Online/onsite lecture/demonstrations
b. students answering questions/problems from text
c. students using hands-on, manipulative or laboratory materials
d. students working in pairs or in groups
e. teacher demonstrations
f. concept mapping
g. library work
h. interpretative discussions
i. use of films, video tapes or filmstrips
j. computer assisted analysts
k. question-answer analysis
l. predicting, observing, explaining
m. improvisation

4. How related is the evaluation used by the teachers with the learning objectives?
5. To what degree do Physics teachers encounter problems as regards:

a. facilities
b. nature of students
c. administrative and supervisory support

6. Is there a relationship between Physics instruction and teachers' teaching performance?

2. Significance of the Study

This study would serve as feedback for the administrators in the University on the existing performance of the Physics teachers in relation to the Physics instruction in the Cagayan State University, in order for them to identify the present needs of the university along academics. It will also serve as basis for administrative decisions, thrusts, and plans for faculty development.

This study will help bring about awareness for the teachers on their existing teaching performance in relation to the Physics instruction in the Cagayan State University. This study would help them reflect and understand themselves better and make necessary adjustments for improvement in the field of science.

This study would benefit the students because the teachers will be pushed to teach better resulting to a real quality education.

This study would help the parents understand the learning quality extended to their children giving them inspiration in sending their children to study at the Cagayan State University.

The results of this study will serve as a baseline data whenever researches similar to this will be conducted.

As one of the faculty members of the College of Natural Sciences & Mathematics in the Cagayan /state University, results of the study would provide reliable information particularly to the Office of Instruction as to who are to be sent for trainings and seminars, for professional growth and improvement and eventually for promotion.

2.1 Scope and Delimitation of the study

The study sought to assess Physics instruction and teachers' performance in Cagayan State University, Philippines

2.2 Time and Locale f the Study

The study was conducted at Cagayan State University, Philippines which has eight (8) campuses namely: Andrews, Aparri, Carig, Gonzaga, Lallo, Lasam, Piat and Sanchez Mira. It was conducted in CY 2020.

3. Materials

In addition to memorandum orders is the questionnaire which was the principal tool used in the study. The questionnaire has seven parts: Part I focused on the profile of the respondents with reference to age, sex, civil status, number of in-service trainings attended, highest educational attainment, number of years of experience in teaching Physics and the respondents' performance rating as rated by the students; Part II determined the teaching attitudes of the respondents; Part III looked into the emphasis on learning objectives; Part IV – their extent of use of the learning objectives, Part V – the respondents' frequency of use of the teaching strategies. Part VI – was used to determine the evaluations used by the teachers, and Part VII – was used to determine the problems encountered by the teachers regarding the nature of students, instructional facilities and supervisory support.

The questionnaire was tried out at the Cagayan National High School in which its reliability coefficient was found to be 0.86 as revealed by the KR-21 analysis.

4. Research Design

The descriptive correlational method was used in the study. The main instrument used in gathering the data was a set of questionnaire which is composed of seven parts: Part I focused on the profile of the respondents with reference to age, sex, civil status, number of in-service trainings attended, highest educational attainment, number of years of experience in teaching Physics and the respondents' performance rating as rated by the students; Part II determined the teaching attitudes of the respondents; Part III looked into the emphasis on learning objectives; Part IV – their extent of use of the learning objectives, Part V – the respondents' frequency of use of the teaching strategies. Part VI – was used to determine the evaluations used by the teachers, and Part VII – was used to determine the problems encountered by the teachers regarding the nature of students, instructional facilities and supervisory support.

The study was conducted to survey the relationship between the Physics instruction and the teachers' performance in all the campuses namely, CSU-Carig, CSU-Andrews, CSU-Piat, CSU-Lallo, CSU-Gonzaga, CSU-Sanchez Mira, CSU-Lasam, and CSU-Aparri. The study involved all the Physics teachers in the campuses stated. Physics instruction served as the independent variable while the performance rating of the Physics teachers served as the dependent variable.

This study made use of the descriptive survey method as it elicited information on the adherence of State Universities and Colleges to faculty development policies and the funding allotted for the program

4.1 Respondents and Sampling Procedure

The respondents involved in the study were the Physics teachers in the different campuses of the Cagayan State University, namely: CSU-Carig, CSU-Andrews, CSU-Piat, CSU-Lallo, CSU-Gonzaga, CSU-Sanchez Mira, CSU-Lasam, and CSU-Aparri.

Purposive sampling was utilized in the study.

4.2 Instrumentation

The questionnaire was the principal tool used in the study. The questionnaire has seven parts: Part I focused on the profile of the respondents with reference to age, sex, civil status, number of in-service trainings attended, highest educational attainment, number of years of experience in teaching Physics and the respondents' performance rating as rated by the students; Part II determined the teaching attitudes of the respondents; Part III looked into the emphasis on learning objectives; Part IV – their extent of use of the learning objectives, Part V – the respondents' frequency of use of the teaching strategies. Part VI – was used to determine the evaluations used by the teachers, and Part VII – was used to determine the problems encountered by the teachers regarding the nature of students, instructional facilities and supervisory support.

The questionnaire was tried out at the Cagayan National High School in which its reliability coefficient was found to be 0.86 as revealed by the KR-21 analysis.

Statistical Treatment of Data

The researcher utilized in her study the following statistical techniques to analyze the data gathered: T-test and the Pearson Moment of Correlation.

For Part I which included pertinent data regarding the educational qualification of the Physics teachers in relation to teaching experience, in-service trainings, faculty rank and performance rating were analyzed with the use of descriptive statistics like, frequency count, percentage and mean.

For Parts II, III, IV, V, VI and VII which included the teaching attitudes of the Physics teachers, emphasis on the learning objectives, extent of the use of the learning objectives, frequency of use of the teaching strategies, teachers' evaluations and problems met by the Physics teachers were analyzed through the use of the Five Point Likert Scale which further analyzed with the use of the weighted mean using the following scale:

4.3 - 5.0 - HP - VME - A - A - A
3.5 - 4.2 - P - OE - So - O - O
2.6 - 3.4 - U - SoE - U - So - So
1.9 - 2.5 - HN - See - Se - Se - Se
1.0 - 1.8 - N - NE - N - N - N

Finally, the Pearson Moment Product of Correlation was used to determine the relationship between the Physics instruction and the teachers' teaching performance.

5. Results and Discussion

This chapter presents the analysis and interpretation of the gathered data.

Attitudes of Physics Teachers towards Physics Teaching

Table 1.. Teachers' attitude towards Physics teaching

Items	Rating	
	x̄	**adj des**
1. Physics is a difficult subject for the students to learn	3.4	U
2. What makes Physics teaching boring is the preparation of laboratory exercise	3.6	P
3. Checking Physics experiments/lessons is time consuming	3.0	U
4. Laboratory-based Physics classes are more effective than non-laboratory classes	4.3	HP
5. Checking problem solving answers of students is frustrating	3.6	P
6. Writing negative comments on the laboratory notebooks of students is discouraging	3.2	U
7. College Physics students should design and conduct their own experiments	3.0	U
8. A great majority of students enjoy the lessons in this subject	3.6	P
9. My mind is kept active in teaching this subject	4.6	HP
10. Knowing Physics is not needed in our society	4.6	HP
11. The materials used in Physics teaching are not at all interesting	4.0	P
12. Laboratory work is difficult to teach	3.6	P
13. Physics teaching does not benefit me in and out of school	1.8	HN
14. Physics helps the students intellectually and culturally	4.3	HP
15. I believe that a subject of this type is not needed by all college students	1.3	HN
16. Physics helps the students interpret situations in life	4.5	HP
17. Physics is one of the most useful subjects I have ever taught	4.5	HP
18. Physics develops good reasoning	4.5	HP
Overall Weighted Mean	3.6	P

Legend:

1 – 1.79	-	highly negative (HN)
1.8 – 2.59	-	negative(N)
2.6 – 3.59	-	uncertain(U)
3.6 – 4.19	-	positive(P)
4.2 – 5	-	highly positive(HP)

Table 1 reveals the attitude of teachers towards Physics teaching. The overall weighted mean shows that the teachers have a positive attitude towards Physics teaching with a weighted mean of 3.6. This result implies that the qualification of the teachers which is one of the requirements before they are hired is a useful tool in the performance of their work. According to Karaalioğlu Çakır & Kadioğlu Akbulut, 2022, only teachers with positive attitude towards their profession can better cope with these difficulties and strive to improve their own teaching approach[5].These data were obtained by adding the weighted mean of the responses of the Physics teachers. Scoring was done in a reverse manner. The positive statements were counted as it is indicated in the questionnaire, while the negative statements were scored positively.

Table 2. Emphasis on the Learning Objectives in their Teaching and Testing

Learning Objectives	Rating	
	x̄	**adj des**
learning basic Science concepts	4.5	VME
observing	4.2	OE
developing inquiry skills	4.3	VME
predicting	3.6	OE
experimenting	4.2	OE
reading information from graphs and tables	4.0	OE
evaluating	4.4	VME
determining cause and effect relationship	4.4	VME
hypothesizing	4.0	OE
). classifying	4.0	OE
. identifying patterns	3.9	OE
12. transformations	4.0	OE
13. applying fundamental Science concepts	4.5	VME

14. developing skills in laboratory techniques	3.9	OE
Weighted Mean	4.1	OE

Legend:

4.3 – 5.0 - very much emphasized (VME)
3.5 – 4.2 - often emphasized (OE)
2.6 – 3.4 - sometimes emphasized (SE)
1.9 – 2.5 - seldom emphasized (SE)
1.0 – 1.8 - never emphasized (NE)

Emphasis on Learning Objectives.

Table 2 unfolds that the respondents have a high emphasis on the learning objectives in their teaching and testing as regards the following behaviors: 1.) learning basic Science concepts, 4.40; 2.) observing, 4.1; 3.) developing inquiry skills, 4.0; 4.) predicting, 3.6; 5.) experimenting, 4.30; 6.) reading information from graphs and tables, 4.20; 7.) evaluating, 4.4; 8.) determining cause and effect relationship, 4.4; 9.) hypothesizing, 3.9; 10.) classifying, 3.8; 11.) identifying patterns, 4.0; 12.) transformations, 4.0; 13.) applying fundamental Science concepts and principles, 4.8; 14.) developing skills in laboratory techniques, 3.7. Generally, the weighted mean on the emphasis of the respondents on the learning objectives in their teaching and testing is 4.05. This implies that the teachers are responsive to the call of the University in pursuit of its mission.

Table 3. The respondents' extent of use of the learning objectives

Learning Objectives	**x̄**	**adj des**
learning basic Science concepts	4.3	A
observing	4.0	S
developing inquiry skills	3.6	S
predicting	3.6	S
experimenting	4.2	S
reading information from graphs and tables	4.2	S
evaluating	4.3	A
determining cause and effect relationship	4.2	S
hypothesizing	4.0	S
). classifying	3.8	S
l. identifying patterns	3.7	S
12. transformations	3.8	S
13. applying fundamental Science concepts	4.4	A
14. developing skills in laboratory techniques	4.0	S
Weighted Mean	4.0	A

Legend:

4.3 – 5.0 - Always (A)
3.5 – 4.2 - Sometimes (S)
2.6 – 3.4 - Uncertain (U)
1.9 – 2.5 - Seldom (Se)
1.0 – 1.8 - Never (N)

Extent of the Use of Learning Objectives.

Learning objectives and assessment are the core elements of any instructional activity. Writing clear and meaningful learning objectives is a necessary skill that teachers need to have in the academic environment. Any instructional activity begins with introducing the lesson topic and learning objectives to the students. To have meaningful student learning, assessment and learning objectives should be linked. The proper linkage of learning objectives and assessment plays a vital role in the success of student learning [6].

Table 3 reveals that the learning objectives in Physics teaching were always used by the Physics teachers in the Cagayan State University with a weighted mean of 4.0. This is in contrast with their emphasis on the learning objectives in their teaching and testing. These findings also justify their very satisfactory performance as rated by their students and supervisors. The table further shows that the scores given to each of the learning objectives are the following: a.) learning basic Science concepts, 4.3; b.) observing, 4.0; c.) developing inquiry skills, 3.8; d.) predicting, 3.6; e.) experimenting, 4.0; f.)

reading information from graphs and tables, 4.1; g.) evaluating, 4.4; h.) determining cause and effect relationship, 4.4; i.) hypothesizing, 3.9; j.) classifying, 3.7; k.) identifying patterns, 4.0; l.) transformations, 3.9; m.) applying fundamental Science concepts and principles, 4.4; and n.) developing skills in laboratory techniques, 3.7.

Table 4. Teaching strategies used by the Physics teachers

Teaching Strategies		
	- x	**adj des**
predicting, observing, explaining	3.9	OU
lecture/demonstrations	4.2	OU
concept mapping	3.4	OU
library work	3.0	SU
interpretative discussion	4.0	OU
students work in pairs or in groups	3.7	OU
question-answer analysis	3.8	OU
films, video tapes or filmstrips	2.1	SU
computer assisted instruction	3.7	OU
). teacher demonstrations	3.8	OU
1. students answering questions/problems from text	3.6	OU
2. students using hands-on, manipulative or laboratory materials	3.6	OU
13. improvisation of instructional materials	3.6	OU
Weighted Mean	3.4	OU

Legend:

4.3 – 5.0 -	always used (AU)
3.5 – 4.2 -	often used (OU)
2.6 – 3.4 -	sometimes used (SU)
1.9 – 2.5 -	seldom used (SeU)
1.0 – 1.8 -	never used (NE)

Teaching Strategies Used by the Physics Teachers.

Table 4 reveals the teaching strategies used by the teachers in teaching Physics. It can be gleaned that teachers often used the lecture/demonstration and interpretative discussions as their strategies in teaching Physics with a mean of 4.2 and 4.0 respectively. According to Sbhatu 2021 and Kunkle & Allen, 2016 common teaching methods in secondary school physics classes is traditional teaching method which would not enhance students' physics learning and their achievement in the subject[7]. It was found out also that the teachers often used the "computer assisted instruction" as a strategy with a mean of 3.7.

Table 5. Consistency of the extent of use of the respondents on the learning objectives and their percent allocation in their evaluation

Learning Objectives	**Extent of Use**	**% Allocation**
1. learning basic Science concepts	4.0	0
2. observing	3.7	0
3. developing inquiry skills	3.7	1.9
4. predicting	3.6	0
5. experimenting	4.0	2.4
6. reading information from graphs and tables	4.0	0
7. evaluating	4.1	78.29
8. determining the cause and effect relationship	4.2	0
9. hypothesizing	3.9	0
10. classifying	3.8	8.14
11. identifying patterns	3.8	1.0
12. transformations	3.8	0.29
3. applying fundamental Science concepts and principles	4.4	8.4
4. developing inquiry skills in laboratory techniques	3.8	0.19

Relationship of the Extent of Use of the Respondents on the Learning Objectives with their Percent Allocation in their Evaluation.

Alignment between assessments, objectives, and instructional strategy, sometimes called the Golden Triangle, is necessary for efficient and effective instruction. The objectives inform the students what the expectations are, the instruction facilitates learning that meets the expectations, and the assessments provide feedback as to whether those expectations are met. If the assessments, objectives, and instruction don't align, not only will instruction be ineffective, but students will also likely become frustrated and disengaged. Intentional alignment helps increase student satisfaction as well as student learning[8].

The table shows the relationship of the teachers' extent of use of the learning objectives with their percent allocation in their evaluation.

Findings reveal that the respondents always use the learning objective "applying fundamental Science concepts and principles" with a mean of 4.4 while their percent allocation in their evaluation is only 8.4%. The learning objective "evaluating" was found to have the greatest percent allocation which is 78.29% while their extent of use is only 4.1. The other learning objectives were minimally allocated in their evaluation while the others were never allocated in their evaluation.

Table 6. Problems met by Physics teachers

Types of Problem	**Rating**	
	- x	**adj des**
Nature of Students		
inattentive	2.5	Se
answering/reciting without being asked by the teacher or while classmate if reciting	2.0	Se
cutting classes	1.2	N
chatting with classmate while teacher is discussing	2.1	Se
truancy	1.7	N
lack of enthusiasm	2.1	Se
teasing	2.0	Se
cheating	2.0	Se
noisy or disorderly entrance to class	2.0	Se
). tapping/knocking on desk and other furniture during class discussion	1.5	N
1. exclaiming unnecessary remarks	1.4	N
12. intentional tardiness	1.6	N
13. intentional absences	1.5	N
14. non-cooperation in group activities	1.5	N
Instructional Facilities		
1. lack of books and other reference materials	2.6	So
2. lack of lecture/laboratory rooms	2.9	So
3. lack of laboratory apparatus	3.0	So
4. lack of chairs	2.0	So
Supervisory Support		
1. rare classroom visitation	2.6	So
2. slow promotion	2.7	So
poor encouragement to attend trainings/seminars	2.8	So
Overall Weighted Mean	2.2	Se

Legend:
4.3 – 5.0 - always met (A)
3.5 – 4.2 - often met (O)
2.6 – 3.4 - sometimes met (So)
1.9 – 2.5 - seldom met (Se)
1.0 – 1.8 - never met (N)

Problems Encountered by the Physics Teachers. Table 6 reveals the problems encountered by the Physics teachers as regards the nature of their students, instructional facilities, and supervisory support.

Findings show that the respondents encountered problems mostly on instructional facilities particularly on the "lack of laboratory apparatus/equipment' with a mean of 3.0 and then "lack of lecture/laboratory rooms" with a mean of 2.9. The teachers encountered problems also on supervisory support particularly on encouragement to attend trainings/seminars and promotion both with a mean of 2.8 and 2.7 respectively.

Table 7. Correlation between Physics instruction and teachers' performance

pinst	teatt	emlo	exlo	futs	teval	pmet	pstud	psup	pave
teatt	1.00								
emlo	0.05	1.00							
exlo	0.04	0.75	1.00						
futs	0.09	0.34	0.32	1.00					
teval	0.09	0.77	0.77	0.73	1.00				
pmet	-0.17	-0.49	-0.55	0.07	-0.28	1.00			
pstud	-0.14	0.22	0.04	0.09	0.19	-0.15	1.00		
psup	-0.28	0.16	0.25	-0.09	0.10	0.02	-0.09	1.00	
pave	-0.23	0.32	0.22	0.08	0.27	-0.09	0.61	0.68	1.00

Critical value (1-tail, 0.05) = + or – 0.37

Critical value (2-tail, 0.05) = + or – 0.43

N = 21

Legend: teatt - teaching attitude

emlo - emphasis on learning objectives

exlo - extent of use of the learning objectives

futs - frequency of use of the teaching strategies

teval - teachers' evaluations

pmet - problems met

pstud - performance rating by students

psup - performance rating by supervisors

pave - average performance rating

Relationship of Physics Instruction and Teachers' Performance. Table 7 presents the correlation between Physics instruction and teachers' performance.

Generally, the table unfolds that there is no significant relationship between Physics instruction and teachers' performance. The relationship between their teaching attitude and performance was found to be -0.23, showing an inverse relationship between the two variables. This implies that Physics teachers with positive attitude towards Physics teaching tends to have a lower performance rating. However, this relationship can be explained by the fact that the evaluation instrument used to evaluate the performance of the teachers does not include items on teaching attitude.

It can be gleaned from the table also that the relationship between the teachers' emphasis on learning objectives and their performance was only 0.32, showing no significant relationship.

As to the Physics teachers' extent of use of the learning objectives and performance, the relationship was found out to be only 0.22, bearing no significant relationship between the two variables also.

The same relationship was found between the teachers' frequency of use of the teaching strategies and performance with a correlation of only 0.08.

The table further reveals that the evaluation used by the Physics teachers was found to have a relationship of 0.27 with their performance, while the problems they encountered appears to have a -0.09 relationship with their performance which implies an inverse relationship between the two variables.

Summary of Findings

This study was conducted to evaluate the relationship of the Physics instruction in the Cagayan State University and the teachers' teaching performance. It was conducted in CY 2020. More specifically, this study sought to ascertain the attitude of the Physics teachers towards Physics teaching, their emphasis on the learning objectives , their extent of use of the learning objectives, their frequency of use of the teaching strategies, their teaching evaluations, the problems met by them regarding the nature of their students, instructional facilities and supervisory support, their teaching performance and their educational qualification.

The descriptive survey was used in the study. One set of questionnaire was used that was pre-tested by the researcher at Saint Louis College and the Cagayan National High School to test its reliability before it was administered to the respondents.

Involved in this study were the Physics teachers who taught Physics during the school year 2019-2020 in any of the campuses of the university, namely: Piat, Carig, Andrews, Lallo, Aparri, Lasam, , Sanchez Mira, and Gonzaga.

Data gathered were compiled, tallied and computed. Relevant data were presented accordingly in tables which were analyzed using the mean, frequency counts, percentage, weighted mean, T-test and Pearson r.

Analysis and interpretation of this study yielded the following results:

Respondents' Profile. The respondents were professionally qualified to teach Physics in the university.

Three of the respondents are earning doctoral units

already, while majority of them pursued masteral degrees related to Physics such as MS in Physics/Physics Education, MTE-Physics, Certificate program in Physics and Master of Arts in teaching Physics.

Only 1 or 5% is still earning units in Physics education but is a BS Physics degree holder.

In terms of positions held, most of the respondents or 57% occupied Assistant Professor positions, 24% are instructors and 19% are Associate Professors.

In terms of teaching experience in Physics, 33% have been teaching for 1-4 years already, 24% for 10-14 years, 14% for 5-9 years, 20% for 20-29 years, 5% for 15-19 years and another 5% for 35-39 years.

Further investigation showed that 57% of the respondents had undergone training hours in Physics teaching ranging from 0 – 50, 19% for 300 and above, 10% for 51 – 100 and 10% for 101 – 150. The remaining 5% had undergone training within 151 – 200 hours.

Generally, the Physics teachers have a positive attitude towards Physics teaching.

The learning objectives emphasized by the Physics teachers with the highest mean of 5.0 was the "application of fundamental Science concepts" followed by "evaluating and determining cause and effect relationship" both with a mean of 4.4 and then "experimenting, reading information from graphs and tables, and learning basic Science concepts," all with a mean of 4.3.

Furthermore, findings reveal that the learning objectives were attained by the Physics teachers with a mean of 4.0. This is in contrast with their emphasis on the learning objectives in their teaching and testing. This also justifies the very satisfactory performance of the Physics teachers.

The general weighted mean of 4.9 indicated that the "question-answer analysis" strategy was used mostly by the teachers, followed by the "lecture/demonstrations and students answering questions/problems from text" with a weighted mean of 4.5. The "computer assisted instruction was the least scored strategy with a mean of 1.5 which means that the respondents never used the "computer assisted instruction" as a strategy in teaching Physics in the university.

The most effective strategy used by the teachers was the "lecture/demonstration" with a percentage of 86% followed by "interpretative discussions" and "question-answer analysis" both with a percentage of 62%.

Findings reveal also that the respondents encountered problems mostly on poor encouragement to attend trainings and slow promotion.

Finally, result of the study revealed no significant relationship between Physics instruction and teachers' performance.

6. Conclusion

Based on the findings of this study, the following conclusions are drawn:

1. The Physics teachers in the entire campuses of the university are professionally qualified to teach Physics. All of them possess the necessary educational preparation in the field of Physics.
2. The respondents exhibited positive favorable attitude towards Physics teaching.
3. The attitude of the Physics teachers is not correlated with their performance.
4. The most effective teaching strategy used by the Physics teachers was the "lecture/demonstration".
5. The Physics instruction in the Cagayan State University is not related with the performance of the Physics teachers.

Recommendations

In accordance with the findings and conclusions, the following recommendations are presented:

1. To fully attain the objectives of Physics instruction in the Cagayan State University, university officials concerned should address the problems on school facilities and support the professional growth of the teachers.
2. While it is true that the Physics teachers are very much qualified to teach Physics, there should be more continuing staff development programs to continually upgrade their teaching competencies.
3. The university through the Physics department should establish linkages with agencies/associations catering to the needs of the Physics teachers, encourage them to have membership in any Physics teachers' associations like the PAPI.
4. Acquisition of useful references and other instructional facilities.
5. Since the study involved the Physics teachers only, the researcher recommends that further study be conducted to include the Physics students in the Cagayan State University.

7. References

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