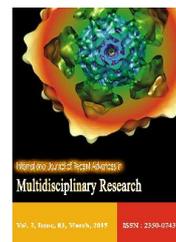


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Research Article

THE EFFECT OF TEACHING AND LEARNING STYLES ON STUDENTS' ACADEMIC ACHIEVEMENT IN GENERAL CHEMISTRY 1 AT THE UNIVERSITY OF EASTERN PHILIPPINES

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ABSTRACT

This study was conducted to determine the effect of teaching and learning styles on students' academic achievement in General Chemistry 1. There were 13 teachers and 123 students who were administered the Teaching Style Instrument and the Learning Style Inventory (LSI), respectively. Final grades of students were taken as evidence of their academic achievement. Findings revealed that teaching styles were transitional in teaching methods, student grouping, room design, teaching environment, teaching characteristics and educational philosophy. Based on LSI, students have strong preferences for cool temperature and an early morning time-of-day. Most students were cautious on other learning style preferences because they chose "it depends" as their reply. As to the effect of teaching and learning styles on student's academic achievement, emotional preference was highly significant in all of the eight areas of teaching styles studied. This study concluded that teaching and learning styles affect students' academic achievement.

INTRODUCTION

Teaching General Chemistry 1 at the University of Eastern Philippines (UEP) in Catarman, Northern Samar is one of the concerns of the College of Science (CS), being a service college. It was observed that most students would either drop out at the middle of the term or fail in chemistry. Latest record of UEP – CS in General Chemistry shows that there were 41% and 39% of the students who failed and dropped in the year 2010 & 2011, respectively. There are reasons why students failed. One is the learning process. Bernardo (1998) says that learning process takes into account the interplay of teacher factors, curriculum, textbooks and classroom environment. Also, there are some faculty members handling Chemistry who tend to make the subject so difficult that students do not feel a sense of success and therefore would either drop or not attend classes. Most teachers know that students have their individual differences but they do not know how they differ, what those differences mean, and how they should be taught (Brandt, 1990). Since, UEP is the only state university in the Eastern Visayas that offers several science – related courses, it is more important to direct this research in this location.

Therefore, helping students enhance their interests and develop an appreciation of General Chemistry will need the identification of their individual learning styles and determination of instructional delivery modes as they relate to academic achievement.

MATERIALS AND METHODS

This study used the descriptive method of research. The teachers' profile that includes age, educational attainment, teaching experience and subject/s taught were taken. Students' profile like age, gender and aptitude test results were also recorded. To determine the teaching styles, Dunn, *et al.*, (1970 Teaching Style Instrument (TSI) was administered. TSI is composed of eight areas: instructional planning, teaching methods, student grouping, room design, teaching environment, evaluation techniques, teaching characteristics and educational philosophy. The Learning Style Inventory (LSI) was administered to students (Dunn *et al.*, 1977). LSI include environmental, emotional, sociological and physiological. Students' profile on age and gender is incorporated in the LSI. This study was conducted at the College of Science University of Eastern Philippines (UEP). UEP is located in Catarman, Northern Samar, Philippines. It is the only state university that offers science-related courses. UEP is composed of eight colleges. One is the College of Science which offers Bachelor of Science Major in Chemistry,

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Biology, Mathematics, Physics and Environmental Science. It is also a service college that offers courses like chemistry, mathematics, biology and physics. This study is concentrated on General Chemistry 1 whose coverage is on Inorganic Chemistry. This is a prerequisite subject for all students taking science-related courses like nursing, veterinary medicine, agriculture, fisheries and science education. To find the relationships between learning styles and teaching styles, Pearson r correlation coefficient was used. Multivariate analysis of variance (MANOVA) was used to determine the effect of teaching styles and learning styles on academic achievement at 0.05 level of significance.

RESULTS AND DISCUSSION

The teaching styles of UEP chemistry teachers were chartered using the Dunn and Dunn Teaching Style Profile Model. The model has five types of teaching styles: individualized, somewhat individualized, transitional, somewhat transitional and traditional.

Table 1. Teaching styles of uep general chemistry 1 teachers

Teaching Styles	Number	Percentage (%)
Traditional	0	0
Somewhat Traditional	4	31
Transitional	9	69
Somewhat Individualized	0	0
Individualized	0	0
Total	13	100

Majority of the teachers (or 69%) were classified as transitional. Transitional teachers are those who are at the midpoint of somewhat traditional and individualized. This result implied that most of UEP General Chemistry 1 teachers are undergoing a transition or a mid shift from the traditional method. Students were given certain degree of freedom, a chance to develop their creativity and resourcefulness. If most of the emphasis of a traditional teacher was the “what” of learning, the transitional teacher emphasized the “why” of learning, thus encouraging experiments and exploratory work. Sometime chemistry games like bingo cards, crossword puzzles were used.

Table 2. Summary of learning preferences of the uep students in general chemistry 1

Stimuli	Learn-ing Prefe-rences	Mean	Standard Devia-tion	Interpre-tation
Environ-ment	Temperature	38.94	10.03	Prefers Cool
Physiological	Time-of-Day	63.21	6.81	Prefers to Learn in the Early Morning

*All the rest of learning style preferences were rated as “it depends”.

Among the 22 elements of learning styles tested, only two elements of learning styles preferences that UEP students

thought very important. They were temperature and time-of-day (Table 2). They preferred cold and early morning time of day. This implied that most students think well when they feel cool. Brain researchers confirm that cold temperature makes the brain more relaxed (Tenedero, Henry, 1998). This result confirms Dunn, *et al.* (1977) findings that not all of the 22 elements that were taken up in this study affect students. The remaining 20 elements of learning styles were in the marginal scores, as rated “it depends”. This means that these preferences were not critical to their learning styles but will vary depending on the situation or the students’ interest. Significant relationships between teaching and learning styles were found: teaching methods with auditory learning mode; instructional planning with variety of teaching methods, studying either alone or with peers; student grouping and room design with late morning and educational philosophy with motivation. Emotional preference was the only element that was found highly significant that affect student achievement. This implied that motivation encourages students to do their best.

Conclusion

The UEP students’ strong learning styles preferences for cool temperature and an early morning time-of-day may be used as basis for designing the classrooms and class programming in order to maximize learning.

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