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DIFFERENTIATED INSTRUCTION TO EFFECTIVE CHEMISTRY TEACHING

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Abstract

This study aimed to investigate the implementation of Differentiated Instruction (DI) among public school teachers in teaching chemistry. Specifically, it intends to determine the extent of practice of DI in using Bloom's Taxonomy. Descriptive, non-experimental type of research design was employed in the study. The respondents of the study were composed of 25 teachers and 250 students which were determined using the stratified random sampling. The researcher utilized adapted instruments that have undergone validation process and yielded acceptable reliability. Mean, standard deviation and independent t-test were used in treatment of the data. Results reveal that secondary school chemistry teachers have a high extent of practice in using differentiated instruction based on Bloom's taxonomy using Understanding as its prompt while moderate extent in the following - Remembering, Applying, Analyzing, Evaluating and Creating. Furthermore, results showed that there is no significant difference on the public secondary school chemistry teachers' extent of implementation of the DI as perceived by the teachers and learners. With these, it is recommended that appropriate and relevant corrective actions must be given to these teachers to improve their pedagogical skills.

***Keywords**: Differentiated Instruction (DI); Chemistry Teaching; Bloom's Taxonomy*

Introduction

As the Philippine education system continues to adapt and evolve, the relevance of differentiated instruction becomes increasingly significant (Department of Education, 2016; Suson, R., et al., 2020; Republic Act 10533). This implies that specifically, in chemistry, teachers need to employ strategies to make the subject more relatable and engaging (Tenaw, n.d.). Teachers need to cater to these diverse learners, ensuring that no student is left behind (Villar, n.d.). While the importance of differentiated instruction in fostering an inclusive learning environment is widely recognized and its effectiveness is well documented, there remains a notable gap in the literature regarding its implementation specifically in high school chemistry teaching within the Philippines. Although, differentiated instruction is a well-established pedagogical strategy, its practical application and frequency of use by teachers within the context of senior high school chemistry teaching in schools in the Philippines have not been comprehensively investigated or documented. This perceived gap on a need for further research and documentation to better understand how teachers are implementing differentiated instruction in this chemistry teaching and how it impacts student learning draws attention to the need for thorough guidelines that address the particular opportunities and challenges involved in modifying instruction for diverse learners within the particular context of high school chemistry teaching. Closing this gap will give educators, curriculum designers, and legislators important information they can use to improve the caliber of chemistry teaching in high school by

implementing strategies for differentiated instruction that work and its frequency of use introduction explains why this research is important or necessary. Specifically, it intended to answer the question: To what extent do the public secondary school chemistry teachers practice differentiated instructions in using Bloom's Taxonomy utilizing the following prompts as perceived by the teachers and students?

1.1 Remembering
1.2 Understanding
1.3 Applying
1.4 Analyzing
1.5 Evaluating
1.6 Creating

Subsection

Methods

This study employed a Descriptive Quantitative Research approach and utilized the quantitative method (survey) as the main source of the data. It determined the extent of practice of differentiated instructions of the public secondary school teachers in using Bloom's Taxonomy utilizing the following prompts: Remembering, Understanding, Applying, Analyzing, Evaluating and Creating.

The respondents of the study were composed of both teachers and students. For the teacher, all the public secondary school teachers in the Schools Division of Isabela City were considered as the population. To identify the sample, a two-stage random sampling was employed. Stratified random sampling was initially employed to identify the number of teachers that represented on which the schools were taken as the strata. After which, a simple random sampling was employed to specifically identify who among the teachers of each school were chosen to be part of the sample. On the other hand, for the students, all the learners handled by the teacher-respondent comprised the population. To comprise the sample, ten-randomly selected students of each teacher were chosen as student-respondents. Since there was a total of 25 teacher-respondents who participated in the study, hence, a total of 250 students became the sample of this research.

Results

The use of Differentiated Instruction to Effective Chemistry Teaching Questionnaire explored the extent of practice of differentiated instructions of the public secondary school teachers teaching Chemistry in terms of using Bloom's Taxonomy. Table 3.1 presents the public secondary school chemistry teachers' extent of practice of differentiated instructions in using Bloom's Taxonomy as perceived by the students and teachers.

Table 3.1 Secondary public school chemistry teachers' extent of practice of Differentiated Instructions in terms of Bloom's Taxonomy

Bloom's Taxonomy	Respondents	Mean	SD	t	p-value	Interpretation
Remembering	Teachers	3.46	0.59	0.965	.36	Not Significant
	Students	3.34	0.62			
Understanding	Teachers	3.67	0.71	1.20	.26	Not Significant
	Students	3.49	0.75			
Applying	Teachers	3.42	0.64	1.1	.30	Not Significant
	Students	3,27	0.70			
Analyzing	Teachers	3.46	0.56	-0.33	.76	Not Significant
	Students	3.50	0.72			
Evaluating	Teachers	3.48	0.48	1.06	.41	Not Significant
	Students	3.37	0.64			
Creating	Teachers	3.47	0.72	0.196	.83	Not Significant
	Students	3.44	0.81			

Note: $N_{teachers} = 25$; $N_{students} = 250$; df = 273

The table shows that the individual p-value for all prompts of Bloom's Taxonomy used (Remembering, Understanding, Applying, Analyzing, Evaluating and Creating), is greater than α=.05. Therefore, there is no significant

difference on the extent of practice of differentiated instructions of public school teachers teaching chemistry in using Bloom's Taxonomy across all its levels as perceived by the teachers and students.

Discussion

Public secondary school chemistry teachers have a high extent of practice in using differentiated instruction utilizing Bloom's taxonomy using Understanding prompt while moderate extent using the following prompts - Remembering, Applying, Analyzing, Evaluating and Creating. Also, public school chemistry teachers significantly practice Differentiated Instruction in using Bloom's Taxonomy only in utilizing Understanding as its prompt, thus, relative to Understanding, the hypothesis is rejected. In contrary, these teachers do not significantly practice Differentiated Instruction in using Bloom's Taxonomy in utilizing Remembering, Applying, Analyzing, Evaluating and Creating, then relative to these DI categories, the hypothesis is accepted. Furthermore, there is no significant difference on the extent of practice in using differentiated instruction utilizing Bloom's taxonomy across all prompts used as perceived by the teachers and students. It was believed that while educators are aware of the importance of using Bloom's Taxonomy in lesson planning, they really had a hard time in integrating into differentiated instruction (Andare et al., 2023). This study did seek to compare the extent of practice of Differentiated Instruction across different subject areas, grade levels, and school contexts could help identify variations in implementation strategies and outcomes. By conducting comparative analyses, researchers can highlight best practices and challenges specific to different educational settings, informing policy and practice decisions.

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