Vol.4, No.1, 2023, pp. 1-5
DOI: https://doi.org/10.29210/810214200

Contents lists available at Journal IICET

Southeast Asian Journal of technology and Science
ISSN: 2723-1151(Print) ISSN 2723-116X (Electronic)

Journal homepage: https://jurnal.iicet.org/index.php/sajts

Dance steps as mnemonic device to increase retention rate of grade 7 students in chemistry

Florentino I. de Guzman[1*)]
[1]DepEd-Lutucan Integrated National High School, Sariaya, Quezon, 4322 Philippines

Article Info

Article history:

Received Dec 18th, 2022
Revised Jan 21th, 2023
Accepted Feb 25th, 2023

Keyword:

Chemistry
Dance mnemonics
Mnemonic devices
Retention rate

ABSTRACT

The main purpose of this study is to determine the effect of using a new type of mnemonic device, utilizing dance steps in teaching Chemistry 7 in the retention rate of students on the properties of metals and non-metals. Different dance mnemonics corresponding to each property of the two types of elements were developed by the researcher. It was then utilized in teaching. The respondents of the study were the 91 grade 7 students of the two classes of the researcher in Science 7 during the first quarter of the S.Y. 2019-2020. Z-test was the statistical treatment used to compare the results of sample-experimental group to that of the population it was taken from. After utilizing the set of dance mnemonics developed corresponding to different properties of metals and non-metals, the samples performed better on the post-test compared to the population which means that using dance steps as mnemonic device increased the retention rate of grade 7 students. This study was limited only in the effect of using dance steps as a mnemonic device to increase the retention rate of grade 7 students in the properties of metals and non-metals.

Corresponding Author:

Guzman, F. I.,
DepEd-Lutucan Integrated National High School, Sariaya, Quezon, 4322 Philippines
Email: florentino.deguzman@deped.gov.ph

Introduction

As technology advances, students became less interested to focus on their studies but allot more time with their gadgets and computers surfing through the internet. With this, the students' performance became poor because the time they are using to review their notes are diverted to their online activities like social media and computer games.

They became less interested and less engaged in the class discussion and at home very seldom to even open their lecture notebooks. These cause the students to have low academic performance with diminishing retention rate in learning.

In the very first year of teaching in the public school as newly hired teacher in junior high school, the teacher-researcher observed the low retention rate among students as reflected in the results of their assessments. This is of great concern as retention is necessary for learning, especially in the spiral progression which is the trend of the curriculum today.

This notion geared the researcher in utilizing a certain technique in teaching whereby students' retention rate will increase. He decided to use dance steps as a mnemonic device in teaching particular lesson in Chemistry 7 about the properties of different types of elements. This is because dancing, aside from computer

games are the hobbies the youth of today are mostly interested with. Similarly, because using mnemonics has been revealed to increase the rate of retention.

Maria Montessori's idea of playful learning and utilization of multiple senses to better learn concepts or lessons inspired the researcher in developing dance steps as an intervention teaching technique. Edgar Dale's cone of experience even strengthen the belief of utilizing bodily movements like dance as an active and participatory learning tool to provide higher rate of retention up to about 75 %.

This research study aimed to analysis the effect of using dance steps as a mnemonic device in teaching the properties of metals and non-metals to the retention rate of grade 7 students.

Method

Research Design
This study mainly focused on the effect of using dance mnemonics in teaching properties of metals and non-metals to the retention rate of grade 7 students. It employed quantitative approach of research in gathering the pertinent data.

Descriptive method was used to collect information about the present existing condition of the study. Data were obtained from the pre-test and post-test results of the sample and the population relative to the utilization of dance steps in teaching.

Population and Sample
The respondents of the study were the 91 grade 7 students from the two sections of Quezon (45) and Del-Pilar (46) in Bukal Sur National High School, Candelaria, Quezon in the school year 2019-2020.

Respondents were chosen purposively since the study was primarily focused on identifying the effect of using dance steps in teaching in the retention rate of the grade 7 students. Similarly, because they were also the only classes handled by the researcher in Science 7.

Research Instrument
The researcher utilized the two teachers' made test, pre-test and post-test (first periodic exam). The tests questions were validated by the three Science 7 teachers and were attested as well by the Science coordinator before the tests administrations. Meanwhile, the dance mnemonics used as an intervention technique to increase the rate of retention of the students was self-formulated by the researcher.

Data Gathering Procedure
At the beginning of the school year, pre-test was first administered before starting any lesson. The teacher-researcher structured and developed different dance steps with complementary chants corresponding to the properties of different types of elements - named as dance mnemonics by the researcher.

During the one-week discussion on the properties of metals and non-metals, a total of eight mnemonic devices, five for metals and three for non-metals was utilized in teaching. First periodic examination was considered as the post-test of the said study focusing mainly on the test questions under the learning competency about the properties of different types of elements. Data gathered from the item analyses of the tests were analyzed and interpreted after.

Statistical Treatment
This study used the one-tailed z-test at 0.05 level of significance to reveal if the sample performs better in the post-test results relative to the population where they were taken. It utilized the said statistical treatment because this study entails the comparison between the mean of the sample to that of the population.

The formula of the z-test used was:

$$Z= \frac{\bar{X} - \mu}{\sigma/\sqrt{n}}$$

where:
$\bar{X}$= sample mean
μ= population mean
σ= population standard deviation
n=sample size
with α=1.65

Ethical Standards

In the onset of the conduct of this study, the learners were informed that they will be undergoing a research intervention, they were encouraged to participate voluntarily. Meanwhile, parents' consents were already obtained during the enrollment process with regards to the utilization of their students' data, photographs and the likes for academic purposes only – making sure that confidentiality of personal information will be secured.

Results and Discussions

Table 1<Comparison of the Sample and Population Mean in the Pre-test>

Variables Compared	Required values	z-test value		Decision	Impression at 0.05 level of significance
		calculated	tabular		
Academic Performance of the Sample and of the Population	$\bar{X}$= 11.78 μ= 11.85 σ= 0.87 n= 91	0.77	1.96	Accept H_o	Not Significant

It is shown in the Table 1 that there is no significant difference between the sample mean and the population mean on the pre-test results. This is because the calculated z-value is less than the tabular z-value. That's why the null hypothesis was accepted.

Therefore, it can be statistically assumed that the samples obtained are a good representation and estimate of the population. That, the sample and the population share the same characteristics in terms of their initial academic performance before the utilization of dance mnemonics.

Table 2 <Dance Mnemonics on Properties of Metals and Non-metals>

Term/Property	Dance Step	Chant	Meaning
Metals	2 claps	Metals are…	Properties of Metals
Luster	dab	…lustrous	Shiny
Malleability	Flexion using hands	…malleable	Can be hammered into thin sheets
Ductility	Right foot step forward and both arms extending side ward	…ductile	Can be drawn into fine wires
Conductor	shake	…conductor	Allows electricity and heat to pass through
Magnetic	Right arm on side position,free hand facing left	…magnetic	Being attracted by magnet
Non-metals	3 claps	Non-metals are…	Properties of Non-metals
Insulator	clean standing position	…insulator	Resists the flow of heat and electricity
Dull	Right foot step forward and both arms extending side ward in open position	…dull	Does not reflect light
Brittleness	Step right foot forward, extending both hands outward showing a half circular motion	…brittle	Breaks easily

Table 2 summarizes the dance mnemonics developed by the researcher to increase the retention rate of grade 7 students in the properties of metals and non-metals. As seen, the dance mnemonics for each of the property involves a dance step and a chant. In congruence to the idea of multiple sensory experiences of Maria Montessori and the cone of experiences of Edgar Dale, that two acts, the dance step and chant allows students to build greater connection making the concepts more likely to be retained.

On table 3, it can be seen that the calculated z-value is greater than that of the tabular z-value. Thus, the decision is to reject the null hypothesis. This means that the samples show higher retention rate denoted by better performance in the post-test results compared to the population after having been taught using different dance mnemonics.

Table 3 <Comparison of the Sample and Population mean in the Post-test>

Variables Compared	**Required values**	**z-test value**		**Decision**	**Impression at 0.05 level of significance**
		calculated	**tabular**		
Academic Performance of the Sample and of the Population	$\bar{X}$= 4.99 μ= 3.56 σ= 1.98 n= 91	6.89	1.65	Reject H_o	Significant

Thorne (2003) emphasized that in order to foster long term memory of new information, one needs to realize that our memory is a network of connections. If we want information to stay in this network, it is best to create many connections to access it. Using mnemonic devices like dance steps can provide connection on bodily movements and a particular concept associated to each step – a link which can provide a network to aide retention.

As learners move through high school and beyond, larger amounts of new information are transferred to them and the types of content presented are often more complex. Mnemonic strategies have been proven to help individuals recall information by making it easier to remember, more meaningful, and more concrete. Mnemonic strategies are an effective study tool which can be utilized with all students and applied to an array of content areas. They can be very useful when working with young adult learners in improving their vocabulary knowledge (Bakken & Simpson, 2011).

The study of Whitescarver (2018) supported the results mentioned above. She concluded that the use of mnemonic devices increased the acquisition and retention of vocabulary. In the survey she had after the instruction, satisfactory rating in ease and enjoyment of using mnemonics was even recorded.

Also, it is parallel to results of the study made by Ashouri and Moghadam (2015). They found out those memory strategies like mnemonics are of great application and importance in the process of short term and long term retention of learners and are potentially efficient technique for vocabulary instruction, acquisition, and long term retention.

In this study a different mnemonic device was introduced. Apart from the known nine types, a new one was developed i.e. utilizing dance steps. Positive results of using dance mnemonics can be supported by Edgar Dale's cone of experience since dancing can be considered as an activity under participatory and active learning tool which basically enables retention up to 75% of what was taught.

Similarly, Maria Montessori's concept of learning even more strengthen the results of this study wherein students are able to utilized multiple senses in executing different dance steps. Those are hearing, seeing, speaking and of course body movements. The more senses involved, the greater the rate of remembering. Likewise, dancing and chanting are enjoyable activities thereby making dance mnemonics more meaningful to learners.

Conclusions

Based on the findings, the following conclusions were drawn: (1) There is no significant difference in the mean profile of the sample and the population in the pre-test. (2) A set of dance mnemonics was developed corresponding to different properties of metals and non-metals. (3) The samples performed better on the post-test compared to the population which means that using dance steps as mnemonic device increased the retention rate of grade 7 students.

The following are hereby recommended: (1) Dance mnemonics can be utilized in teaching concept in science which entails great remembering skills. (2) Similar and parallel studies may be conducted in different locales as the subjects of the research to test its external validity. (3) Qualitative approach can be used to study the affective dimensions of the conducted research.

Acknowledgments

The researcher would like to acknowledge the student-respondents and school teaching and non-teaching personnel from DepEd-Bukal Sur National High School, Candelaria, Quezon, 4323 Philippines.

References

Ashouri, P. & Moghadam, M. Y. (2015). The effect of instructing mnemonic devices on immediate versus delayed vocabulary retention. International Journal of Language Learning and Applied Linguistics World (IJLLALW) Volume 8 (1), January 2015; 87---102. Retrieved 25 September 2019, from https://pdfs.semanticscholar.org/e48c/da 920f443bb0dfb037bc2661885f849af412.pdf.

Bakken, J. P. & Simpson, C. G. (2011). Mnemonic strategies: success for the young-adult learner. The Journal of Human Resource and Adult Learning Vol. 7, Num. 2, December 2011. Retrieved 25 September 2019, from https://pdfs.semanticsch olar.org/198c/9e62067bc47dc47048b0884dc9c57042a8df.pdf.

Dehn, M.J. (2008) Working memory and academic learning: assessment and intervention. Hoboken, NJ. John Wiley & Sons, Inc.

Thorne, Glenda. (2003). What strategies can be used to increase memory? Retrieved 26 September 2019, from: http://www.cdl.org/articles/what-strategies-can-be-used-toi ncrease- memory/

Tolen, A. &Quinlin, L. (2017). The efficacy of student retention: a review of research & literature. Retrieved 25 September 2019, from https://www.sjsd.k12.mo.us/cms/lib/M O010 01773/Centricity/Domain/59/retention.pdf

University of Central Florida, (n.d.). 9 types of mnemonics for better memory. Retrieved 25 September 2019, from https://www.seattleu.edu/media/learning-assistance-programs/files / 9-Types-of -Mnemonics-for- Better-Memorya4 b4.pdf

Whitescarver, Erin L., (2018). "Effect of mnemonics on the vocabulary acquisition and retention of high school students with learning disabilities". Theses and Dissertations. 2567. Retrieved 25 September 2019, from https://pdfs.semanticsc holar.org/58a4/13918c0d1ebff5f932ad4e9971ddf5f9a90b.pdf