

UTILIZING EDPUZZLE AS PRE-LABORATORY DISCUSSION TOOL TO ENHANCE LABORATORY PERFORMANCE OF GRADE 9 STUDENTS OF XAVIER UNIVERSITY

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Abstract

This study aimed to determine whether the pre-laboratory discussion video enhances and determines possible indicators of the enhancement of laboratory performance among the actual 27 participants in one Grade 9 class of Xavier University Junior High School. Moreover, the study aims to know how were the experiences of students and teachers with the integration of the EdPuzzle discussion video, and learning how the results of the study help the community to further improve the laboratory procedures enhancement of Grade 9 students in a hybrid mode of learning. This study employed the mixed method design which is the combination of qualitative and quantitative approach to collect and analyze data. As for the sampling procedure, this study uses a purposive sampling, where the respondents of this study were selected on a specific grade level and section. Based on the results, there was an increase in test score results from pretest in which there are those who failed and to the post-test in which all passed. Moreover, there was a “significant difference “ between the pretest and posttest data through the T-test results and the FGD responses through thematic analysis. Through the utilization of the EdPuzzle discussion, students' interests increased in conducting more experiments in order to understand in depth the world around us. In addition to this, students' test scores have a congruence to the performance rubric results. Prior to performing the experiment, students can be prepared by watching the EdPuzzle pre-laboratory discussion video and learning technical terms, equipment, and laboratory procedures. Hence, pretest and post-test scores improvement, good performance rubric results, rejection of the null hypothesis, and no groups required for experiment repetition, indicates conceptual and procedural knowledge retention of the students. It is recommended that the EdPuzzle pre-laboratory discussion be used in laboratory experiments in Xavier University Junior High School.

Keywords: *EdPuzzle, Pre-Laboratory, discussion video, Pre-test and Post-test, Laboratory performance*

Introduction

Particularly in light of the COVID-19 pandemic's recent emergence, online courses represent a breakthrough development in educational technology. Up to 70% of 10-year olds in low and middle-income nations are unable to read or comprehend a simple paragraph as a result of learning deficits caused by school closures, up from 53% before the pandemic (Thompson, 2022). According to a study by Kuhfeld, Soland, Lewis, & Morton (2022), reading test scores were 0.09-0.18 standard deviations (SDs) lower than peers in the same grade in the fall of 2019, while average math test scores in grades 3 through 8 were 0.20-0.27 SDs lower. What's more alarming is that, especially during the 2020–21 school year, the test-score gaps between pupils in low-poverty and high-poverty elementary schools widened by around 20% in math (equivalent to 0.20 SDs) and 15% in reading (0.13 SDs).

Additionally, achievement generally declined more between fall 2020 and 2021 than it did between fall 2019 and 2020 both generally and differently by school poverty, suggesting that disruptions to learning have continued to negatively affect students well past the initial hits following the spring 2020 school closures. Virtual classrooms, activities, and laboratory sessions were substituted for traditional classroom instruction in all courses (Seery, Barreda, & Hein, 2021). In many online courses and programs, low retention rates are becoming an increasing source of worry as participation in online courses increases quickly.

In order to provide a quality and safe learning environment during the transition from online learning to hybrid learning, students must be able to participate in laboratory

activities first-hand and be well-equipped with the necessary skills and knowledge. A procedure carried out with the aid of an online interactive application composed of demonstration videos and formative assessments that promotes knowledge acquisition and student retention in advance of laboratory enhancement activities.

Significance of the Study

This study intends to determine any potential impacts of integrating EdPuzzle to the students' performance on laboratory procedures of Xavier University Junior High school students utilizing the curriculum of Flexible Learning Plus. With reference to pre-laboratory activities, student laboratory performance was assessed as part of an intervention using a formative assessment using a web-based tool. In light of this, student proficiency with laboratory activities is necessary for good knowledge retention, lesson recall, and laboratory safety. Methods and intermediate products must be carefully worked out in order to impart knowledge to the students moving forward. This online enhancement tool was crucial in closing that gap, enabling the students to further their education and perform during the enhancement activities in a safe and effective manner.

Students can benefit from various learning opportunities in laboratory lessons. It provides a link between conceptual and practical domains as well as a link between micro and macroscales. Furthermore, qualitative and quantitative experiments enable the development of technical and manipulative skills. Students have the opportunity to work alone or in groups, where the need of attending staff may be reduced. Most significantly, students get the chance to work on their studies while being mentored by scientists experts in the specific fields of science or perhaps PhD researchers as well.

Students may witness and begin to acquire our methods of thinking in undertaking research using this strategy. This way of thinking can be observed in students' involvement with the research literature and experimental data, as well as their efforts to master the subject's requirements and conventions for written and oral discourse (O'Brien & Cameron, 2008). It is crucial to ensure students learn meaningfully during their laboratory lessons. The student must integrate conceptual and procedural knowledge, accomplish certain activities in a defined amount of time, and write a laboratory report that may be evaluated. This can make laboratory classes challenging. From these, it is clear that preparation is beneficial, particularly when it comes to having some familiarity with the concepts and techniques that will be applied.

Utilizing interventions can aid these types of challenges during the hybrid learning. In a study conducted by the University of Minnesota (2022), utilizing interactive demonstration videos provided a new learning opportunity for the students. The majority of students concluded that watching the videos before the laboratory helped them feel more confident about learning the new experiment procedures and helped them feel less anxious about handling the apparatus and equipment. The videos provided more information than reading a book or looking at a still image of a device. In relation to this, studies identified that students could determine who had viewed the demonstration videos with confidence, and that those who had were better at setting up an instrument for the first time.

Gap in Knowledge

Despite the continuous utilization and research study of employing online enhancement applications, such as EdPuzzle, there is now an obvious lack of additional

research on how integrating online enhancement applications to discussions, particularly in pre-laboratory classes, enhances student retention in local settings. In addition to this, related literature about utilizing online enhancement tools does not focus on the Science laboratory aspect but rather on different fields of studies such as English, Math, and Social Sciences.

Hence, the researchers will offer fresh perspectives on the subject of improving student retention through localized applications of online enhancement in order to close the knowledge gap. The goal of this action research is to use an online enhancement tool for pre-laboratory discussions and to gather data to assess if student retention has significantly improved. Therefore, this study would offer pertinent data that may serve as a precursor to subsequent research on the effectiveness of integrating online enhancement tools on pre-laboratory lessons in a local context.

Statement of the Problem

Due to the pandemic, laboratory sessions were shifted to recorded videos, which did not guarantee a high rate of student Performance and retention. Furthermore, because of the change from fully online classes to hybrid learning, students have limited experience managing the vast amount of glassware and apparatus in their laboratory facilities. Despite written instructions, people consistently commit the same errors because they are afraid of damaging expensive equipment or ruining their experiment. Since many of the students are inexperienced in both laboratory technique and theory, preparation for each laboratory activity needs to be emphasized.

At present, educational institutions are obliged to switch to a remote or distance learning mode as a result of the unanticipated COVID-19 pandemic. Classes were

eventually made available online, and this change in the delivery method caused several difficulties, particularly when it came to teaching laboratory courses. However, studies carried out during the COVID-19 pandemic have shown that students feel the need to experience a laboratory setting, knowing that its main function is to provide a hands-on learning experience which the on-line set-up is devoid of. In fact, research has shown that students in a virtual environment have difficulty finishing skill-based activities and comprehending how to operate laboratory equipment (Mojica & Upmacis, 2022).

These kinds of difficulties can be overcome during hybrid learning by using interventions. In a research by the University of Minnesota (2022), the students had a new learning opportunity due to the use of interactive demonstration videos. The majority of students came to the conclusion that seeing the videos before going to the laboratory enabled them to feel more confident about acquiring new experiment methodologies and less apprehensive about utilizing the apparatus and equipment.

RESEARCH QUESTIONS

The purpose of this study is to determine the impact of EdPuzzle to the students' laboratory performance. It specifically aims to answer the following questions;

1. How did the intervention enhance the students' retention of the pre-laboratory procedures?
2. What is the laboratory procedure of the students based on the following predetermined criteria:
 - a. On Performing the Experiment
 - b. Handling the Apparatus
 - c. Follows Safety Laboratory Measures and Guidelines
 - d. Knowledge of the Experiment
3. What were the experiences of the students in the utilization of EdPuzzle as a pre-laboratory discussion tool?
4. How can the results of this study be used to further improve the laboratory procedures retention of grade 9 students in a hybrid mode of learning?

The objective of this study is to assess whether the integration of online applications in teaching is effective in retaining information to the students. Considering that the online mode of learning is still effective these days, classroom discussions have been taking place in different online platforms; such as Google Meet and Zoom. From the recent announcement from the Commission on Higher Education about the implementation of flexible learning amidst the Covid - 19 era, students are now allowed to go on campus to attend classes, take exams, and perform laboratory activities in the campus in accordance to the students' assigned class schedule. Though, online discussions are still in place for the selected subjects. Quizzes and science experiments are also taken online, through the help of laboratory simulations. Nonetheless, the application of Online to Face-to-face set up is completely different in terms of the actual demonstration of the actual experiments in the campus. Hence, leading the students to be confused and hesitant to initiate activities in the laboratory. Thus, providing pre laboratory discussions in such online applications before immersing students in the actual laboratory is being tested in this study. Determining the efficacy of online applications on student retention

Methodology

This study employed the mixed method design which is the combination of qualitative and quantitative approach to collect and analyze data. Descriptive research is scientific research that describes an event, phenomenon, or fact in a systematic manner in relation to a specific area or population. Qualitative research entails the collection, analysis, and interpretation of extensive narrative and visual data in order to gain understanding into a specific phenomenon and quantitative research is a systematic

investigation of phenomena by gathering quantifiable data and performing statistical analysis. The goal of this study was to investigate, describe, and comprehend the impact of incorporating an EdPuzzle application on student retention, how the intervention improved students' retention of pre-laboratory procedures, and what possible indicators indicate laboratory procedure retention.

During the 2022-2023 school year, this study will be done at Xavier University Junior High School (XUJHS). XUJHS is run by Jesuits, lay faculty and staff, parents, and other members of the Xavier University Community working together. It uses a method of teaching that combines Ignatian spirituality and the principles of the Jesuit Ratio. This method teaches and shapes students into leaders who are self-disciplined, analytical, and well-ordered in their thinking. They are also open to other ideas and entrepreneurial when it comes to the needs of the community and society. They are driven by a desire for excellence and a desire to help others (Xavier University - Ateneo de Cagayan JHS, 2021).

Since the pandemic started, Xavier University Junior High School has switched to flexible learning. With flexible learning, students do not have direct access to school laboratories, so Junior High School Science teachers came up with a way for students to do an experiment in hybrid to help them understand the concepts and do better in science, especially in terms of retention. Students need to remember what they learned in the laboratory in order to do the experiment in the right way. Proper care, and they should always know enough about their experiment. Hence, if the students are aware beforehand what tool the researchers will be using, they will be able to use that knowledge when

doing the experiment. Furthermore, the tool that will be used is not only important for the experiment, but it can also be used for hybrid learning in different subjects.

In this study, the researcher used purposive sampling (also known as judgment, selective or subjective sampling) to obtain the sample. Purposive sampling is the process of selecting samples by taking subjects that are chosen for their specific purpose rather than their level or area. With purpose sampling, the researcher can select those who are representative of the population. A pilot - testing took place prior to the implementation of the study. The participants of the pilot - testing were the Grade 9Fr. Lucas students. This research study utilized two tests as the research instrument. First, a pre-test prior in using the online enhancement tool. This consists of an assessment that measures the students knowledge of the lesson. Lastly, an online post-test which was done onsite during the laboratory enhancement activity schedule. Furthermore, the researchers used an observation rubric with specific indicators that measured kinesthetic retention and also open-ended interview questions that assessed the effectiveness of the enhancement tool such as EdPuzzle in the students performance on the laboratory procedures and concepts.

Two experts reviewed the content, construct, and face validity. Prior to collecting the essential study-related data, the validation procedure was carried out. Their recommendations were included in the tool's complete form after this is completed. Twenty-seven (27) invited student-participants who are currently enrolled in Grade 9- Fr. Lucas, excluding those who are handled by the cooperating teacher, participated in the pilot testing to examine the reliability during the third quarter of the second semester of the academic year 2022-2023. To determine the reliability coefficients, Cronbach's alpha

was utilized. The validation and reliability resulted in 0.6 which is acceptable. Cronbach's alpha is a measure used to assess the internal consistency or reliability of a group of scale or test items. Cronbach's alpha is one approach to gauge the strength of such consistency. In other words, the reliability of any measurement relates to the degree to which it is a consistent measure of a notion (University of Virginia, 2015).

Ethical Considerations

The researchers followed ethical guidelines when performing the research before data gathering. Furthermore, the researchers provided informed assent forms for the research participants as well as informed consent forms explaining the methods and purposes of the study to the parents of the participants.

Results and Discussion

The first objective of this study was to determine how the Edpuzzle enhances students' retention of pre-laboratory procedures.

Table 1 shows the students' pre-test scores without the intervention of EdPuzzle Pre-Laboratory Discussion Video.

Table 1.2 displays the post-test scores of students who used the EdPuzzle Pre Laboratory Discussion Video.

Table 1.3 shows a comparison of students' pre- and post-test scores.

Table 1.4 shows the paired T-tests results

Table 1. Students' Pre-Test Scores Without the Utilization of EdPuzzle Pre-Laboratory Discussion Video

Score Range	Frequency	Percentage	Remarks
8-15	15	55.56%	Passed
0-7	12	44.44%	Failed
Total	27	100	

The Table 1 above presents the tally of the pre-test scores with corresponding percentage and remarks of students' score. There were 27 respondents who took the pretest. Based on the table above, it is found that 15 of the students scored 8 and above while 12 of the participants scored 7 and below. This indicates that 15 of the participants passed the pre test while 12 participants failed. This implies that the 12 participants had less prior knowledge about the concept of the experiment while 15 participants had prior knowledge of the concept of the experiment.

Studies have shown that prior knowledge contributes to future success. Specifically, students who have prior knowledge of chemistry are more likely to perform better in their examinations (Childs & Sheehan, 2009; Seery, 2009).

Table 1.2 Students' Post-Test Scores Utilizing the EdPuzzle Pre-Laboratory Discussion Video

Score Range	Frequency	Percentage	Remarks
8-15	27	100%	Passed
0-7	0	0%	
Total	27	100	

The Table 1.2 above presents the tally of the post test scores with corresponding percentage and remarks. There were 27 participants who also took the post test. The table above shows that 27 of the participants scored 8 and above while there were no students who scored 7 and below. This indicates that 27 participants passed the post test and there were no students failed. This implies that the students retained the information from the pre-laboratory procedures discussion video.

Edpuzzle has shown to be a highly effective tool for student engagement in the Biochemistry laboratory and can be utilized in other undergraduate laboratories as a replacement for existing pre-laboratory preparation methods (Shameka & Zachary, 2021).

Table 1.3 Comparison of Students' Scores Pre-Test and Post-Test

Description	Pre-Test	Post-Test	% Increase/Decrease
Passed	55.56%	100%	44.44
Failed	44.44%	0%	-44.44

The Table 1.3 above shows the comparison of the students' scores during the pre test and post test. The table also presents the percentage of students who passed and failed in the pre-test and post-test and the percentage increase/ decrease of the number of students who passed or failed the test.

Based on table 1.3, the result shows that 55.56% of the participants passed the pre-test while 100% passed the post test. This indicates that there is an increase of 44.44% of the participants who passed the test. The table also shows that there are 44.44% of the participants who failed the pre-test while 0% failed in the post test. This indicates that there is a decrease of 44.44% of the participants who failed the post test. This implies that there is an improvement of students' scores when the EdPuzzle was utilized. It also implies that the students retained the content from the EdPuzzle Pre-laboratory procedures discussion video.

The study revealed that employing educational technology such as Edpuzzle Learning Videos proved effective in learning Biology for Middle Secondary School. Moreover, academic scores increased on the post-test as a result of the student's active participation and engagement in their studies (Kinga Tshering ,Kesang Wangchuk , Nima Dorji, Kelzang Dema, 2022).

Table 17.4 Results According to the Paired T-Test

	n	Mean	SD	t-cal/ stat	df	p
Pre-Test	27	7.37	1.64	-10.9	26	<0.001
Post- Test	27	11.67	1.88			

Table 1.4 contains the findings of the paired t-test that was performed in order to analyze the significant difference in score between the pretest and the post test. Since the p-value that was calculated as a result of the data found to be less than 0.05, this demonstrates that the difference in score that was achieved between the pretest and the post test was one that was statistically significant. The $n = 27$ based on the number of students and the mean of the pretest is 7.37 and the mean of the post test is 11.67 which has -10.9 of its statistics.

Based on the data, the “null hypothesis,” which states that there is no significant difference between the scores on the pretest and the post test, cannot be supported. This indicates that there is evidence to suggest that the pre-test scores and the post-test scores are significantly different from one another and that the intervention, which is the EdPuzzle pre-laboratory discussion video being utilized, had resulted on the subject.

Table 2. Rubric Analysis Results

Group #	On Performing the Experiment	Handling the Apparatus	Follows Safety Laboratory Measures and Guidelines	Knowledge of the Experiment	Total Score
1	4 (Sophisticated)	4 (Sophisticated)	3 (Acceptable)	4 (Sophisticated)	15
2	3 (Acceptable)	4 (Sophisticated)	3 (Acceptable)	3 (Acceptable)	13
3	3 (Acceptable)	3 (Acceptable)	2 (Developing Competence)	4 (Sophisticated)	12
4	2 (Developing Competence)	4 (Sophisticated)	3 (Acceptable)	3 (Acceptable)	12
5	3 (Acceptable)	3 (Acceptable)	4 (Sophisticated)	4 (Sophisticated)	14
6	3 (Acceptable)	3 (Acceptable)	3 (Acceptable)	4 (Sophisticated)	13

Table 2. Rubric analysis shows the raw scores of the groups based on the observation rubric. The score of 4 is the highest rate and the score of 1 is the least score, these scores are associated with its descriptors (4-Sophisticated, 3-Acceptable, 2-Developing Competence, and 1-Inadequate), since there are 4 criteria for scoring, the

total score of this rubric is 16, that is equivalent to 100%. The total score of each group is varied based on the percentage the score falls to, as 15 is the highest score from Group 1, equating to 95.7%. Followed by Group 5 for having a total score of 14, which is 87.5%. Groups 2 and 6 have a score of 13, which is equivalent to 81.25%. While Groups 3 and 4 on the other hand have a total score of 12, that equates to 75%.

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Table 2.1 Results on the Average Scores of Students in the Test and Performance

Rubric

Group Number	Coded Names	Total Average of the Pre and Post Test Scores Per Student	Total Average of the Pre and Post Test Scores Per Group	Total Score of Rubric per Group
1	0023	10	9.875	15
	0014	7.5		
	0020	11		
	0021	11		
2	002	11.5	9.6	13
	0011	8.5		
	0015	10.5		
	0017	9		
	0026	8.5		
3	0018	9.5	9.375	12
	001	10		
	0027	9		
	009	9		
4	005	11.5	10.375	12
	0019	10		
	0025	10.5		
	007	9.5		
5	007	8.5		
	004	10		
	006	8.5	9.1	14
	0013	9		
	0022	9.5		
6	008	11.5	8.7	13
	0024	10		
	003	8		
	0012	7		
	0010	7		

Table 2.1 Results of the Average Scores of Students in the Test and Performance Rubric discusses the relation of the individual average scores of the pre-test and post-test of the students and to their corresponding groups. The names of the students are labeled as codes to protect their data. As seen in the first group, the average scores of each student varies to each other, yet their overall scores in the performance rubric falls to have the highest rating, having a score of 15. Followed by the second group, the scores of the students still vary from one another and have a total score of 13 in the performance rubric. In the third and fourth group, both have the performance rubric score of 12 and the average test scores of the students still vary from their group mates. In the fifth group, their group has a performance score rubric of 14 and as observed in their individual test scores, all still differ from one another. And to the last group, the sixth group has an overall performance score of 13 and the scores of each of the members in this group still varies from one another.

From this information, it shows that regardless of the variation of scores of the students in the pre-test and post-test, the groups were still able to have good scores in the performance assessment. As this research study does not only measure the cognitive knowledge of the students comprehension of the laboratory procedure, but this also measure the student's retention skills in performing the laboratory experiment, with the guided steps of the procedures that was discussed in the pre-laboratory discussion through the integration of the online application EdPuzzle. According to Katherine Sauro (2022) kinesthetic performance in the classroom positively affects students' academic achievement. Further, she suggests that students being provided with movement spend notably more time on task than those who are stationary.

Researchers were able to make a number of conclusions regarding how employing the EdPuzzle pre-laboratory discussion video improves student retention according to the findings of the *thematic analysis* that was done following focus group discussions. As a result, the focus group discussion participant's replies demonstrated considerable improvements in their experiment preparation and laboratory performance.

Theme 1: Informative and Prepares students

According to the students' experiences, utilizing the EdPuzzle pre-laboratory discussion enabled them to equip themselves with essential knowledge about the experiment. It gave them the opportunity to learn technical concepts prior to the laboratory session, and made them feel motivated on the things to expect. This implies that EdPuzzle helps students to be prepared prior to the Laboratory Experiments.

According to the University of California (2022), utilizing a discussion of the pre-lab assignment as the basis for the pre-lab introduction and as a tool for presenting the lab, it is possible to make sure that the students have a solid understanding of the subject matter before the actual lab work commences.

Theme 2: Boosts confidence and Provides guidance

Students appear more prepared for their laboratory experiments as a result of the integration of EdPuzzle's pre-laboratory discussion video, according to their responses. The EdPuzzle is really helpful in letting them know what to do and what not to do. It provided them with precise information and instructions for carrying out the experiments. Since the Laboratory procedure was incorporated into EdPuzzle, students also don't have as much confusion.

From the study of Dalgarno et al., (nd), students who utilized the virtual laboratory were generally positive about the value of the virtual laboratory in contributing to their confidence and reducing their anxiety about practical work. Majority of the students expressed that the virtual laboratory contributed their knowledge to locate tools of apparatus, and to work out which laboratory apparatus to use, which they assumed would have improved their confidence.

Theme 3 : Motivating and Increases optimism

Students were more motivated and interested in conducting more experiments as a result of the incorporation of the EdPuzzle pre-laboratory discussion video. The students were motivated because it gave them the opportunity to take charge of their own education and develop metacognitive abilities. One important characteristic that the

learners greatly valued was the availability and simplicity of information, made possible by the use of digital tools such as EdPuzzle. This implies that the use of EdPuzzle Pre-Laboratory discussion video promotes students' motivation.

Pre-lab modules that provide information and questions on the difficult conceptual concepts pertinent to the lab experiment can easily be added to current expository laboratories to enhance students' comprehension of background theory and its relationship to practice (Haagsman et al., 2020).

Results from the Focus Group Discussion Responses of the Students were grouped in accordance with the following major themes that came to light during data analysis, namely: Informative and Prepares students, Boosts confidence and Provides guidance, and Motivating and Increases optimism.

The results of this study be used to further improve the laboratory procedures retention of grade 9 students in a hybrid mode of learning.

Through the pre-laboratory discussion video, the students' performance improved on doing the experiment since they were able to correct assumptions about the experiment, concretize conceptual and procedural knowledge, and address what might happen negatively during the experiment. In connection to this, student motivation also increased. Since the integration of EdPuzzle pre-laboratory discussion enables the students to be prepared prior to conducting the experiment, it also piques their interest on the things to expect after the experiment. Moreover, it enables them to appreciate things in their surroundings and piques their interest in conducting more experiments in the future to further understand in-depth why those things are the way they are in the environment. The pre-laboratory discussion video therefore, improved students' preparedness and motivation in conducting the experiment which increased their confidence on how they manipulate different apparatus and do the experiment in general with lesser guidance from their teacher.

The adoption of this study enhances the laboratory performance of the students and to continue utilizing EdPuzzle to other laboratory experiments with the utmost guidance of the laboratory technician since they are more inclined to the laboratory

procedures and measurements, but of course in collaboration with the subject teacher. Furthermore, together with the integration of EdPuzzle, there should be at least a two week gap between the intervention and post-test. In addition, it might not only be limited to Chemistry experiments but to other areas in Science.

Conclusion

The results of the data analysis indicate that there is a significant change in terms of the integration of the Pre-Laboratory Procedure Video to the students' performance and knowledge in their soap-making experiment. The scores of the students in comparison to their pre-test improves based on the results of their post-test. Thus, this just tells that the integration of the online application EdPuzzle helped the student's understanding of the laboratory manual, rather than just reading the manual alone. In relation to the student's kinesthetic performance in doing the experiment, based on the scores of each group, all of them fall to being sophisticated in their experiments. This includes how the student handles the apparatus, follows the laboratory safety protocol and guidelines, and the overall knowledge of performing the experiment. Hence, through the EdPuzzle video, the students became confident and knowledgeable about the procedures on performing their soap-making experiment. They get to be familiar with the accurate measurements of the liquid substances being used and what are the experimental milestones that they should be expecting to reach the success of their experiment. Moreover, the integration of the online application EdPuzzle allows the Grade-9 students to be more engaged and helps them retain information, to be able to perform their experiments following the right procedures and less supervision of their teacher. Furthermore, the innovation of teaching methods in handling the 21st Century

students is critical for the development of a successful learning process. With the use of the online application EdPuzzle, the success of the student's experiment resulted in a positive outcome as their soap successfully saponified.

RECOMMENDATIONS

There are certain gaps that this research was unable to address but which would benefit from further investigation. In light of this, the recommendations below are made.

1. To consolidate additional studies and different research that employs the same method of integration on the application and usefulness of instructional technology such as EdPuzzle Learning Videos. And to confirm its effectiveness of integration.
2. The lab technician and the teacher worked together to create the pre-laboratory discussion video.
3. The Xavier University Junior High School Science Department faculty may consider the utilization of EdPuzzle as a Pre-Laboratory tool in enhancing conceptual knowledge retention.
4. The Xavier University Junior High School Science Department faculty may consider the utilization of EdPuzzle as a Pre-Laboratory tool in enhancing procedural knowledge retention.

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