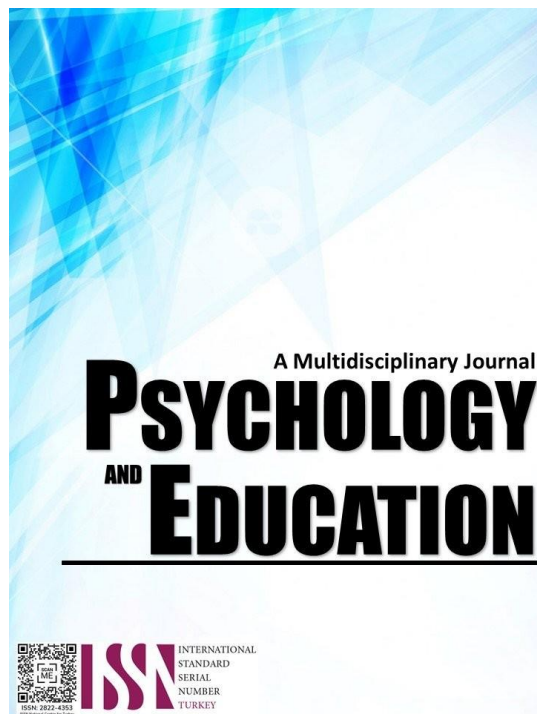


CONTEXTUALIZED VIDEO LESSONS IN TEACHING CHEMISTRY FOR GRADE 9 LEARNERS



PSYCHOLOGY AND EDUCATION: A MULTIDISCIPLINARY JOURNAL

2023

Volume: 12

Pages: 719-729

Document ID: 2023PEMJ1098

DOI: 10.5281/zenodo.8274872

Manuscript Accepted: 2023-22-8

Contextualized Video Lessons in Teaching Chemistry for Grade 9 Learners

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Abstract

This study aimed to develop and evaluate the Contextualized Video Lessons in Teaching Chemistry for Grade 9 Learners at Tanay West National High School, Tanay, Rizal. The study used descriptive-evaluative and quasi-experimental research design utilizing two instruments, such as questionnaire-checklist and teacher-made pre-test and post-test. The respondents were composed of twenty (20) Science teachers and ten (10) ICT experts, while the developed contextualized video lessons were utilized among thirty (30) grade 9 learners in an online class. Mean was used to determine the evaluation of the developed contextualized video lessons in terms of content, instructional, and technical quality, and error found, while dependent t-test was used to determine the significant difference on the performance of grade 9 learners before and after the exposure to the developed video lessons. Based on the summary of findings, the following conclusions were drawn: the developed contextualized video lessons have followed and aligned with the suggested competencies and were engaging and commendable as evaluated by the respondents. The developed material obtained an excellent rating as evaluated by the Science teachers and ICT experts, which can be used as a supporting instructional material to enrich learning and can be assessed for its effectiveness using different variables.

Keywords: *development and evaluation, chemistry, contextualized, video lessons, instructional materials*

Introduction

Education is a privilege that everyone must have, as it is one of the fundamental human rights that lies at the heart of United Nations Educational, Scientific and Cultural Organization (UNESCO) mission, and that is being preserved in the Universal Declaration of Human Rights (UDHR) and many other international human rights associations. Wherein, UNESCO defines education as “an empowering right on which marginalized children and adults can lift themselves out of poverty and participate fully in society” (UNESCO, Right to Education).

To provide a quality education is the common goal of each institution, which is greatly affected by the challenges brought by this pandemic; issues that are needed to be carefully and properly built with the educational system in the “new normal” here in the Philippines (Angara, 2020). Everyone experienced the changes in their community, including the educational system that is happening now, where both teachers and students need to transform their mindset and adopt the new settings on the teaching-learning process (Lagua, 2020).

The Department of Education (DepEd) implements different online learning resources such as DepEd Commons website and Learning Resources and Management Development System (LRMDS) to address this quarantine issues (Angara, 2020). This

new settings in teaching, especially online classes, must ensure that students are engaged, wherein, they are directed and well-motivated (Lagua, 2020). The need for development and progress in education, especially in science and technology where the curricula must be equipped with the latest trends and information. Relative to this, DepEd Order No. 35, s. 2016, which is known as “The Learning Action Cell as a K to 12 Basic Education Program School-Based Continuing Professional Development Strategy for the Improvement of Teaching and Learning”, Section 15.4 states that:

“Teachers must enrich lessons with simple integration strategies utilizing Information and Communications Technology (ICT) that are developmentally appropriate. Instruction and assessment processes can be made more collaborative with ICT, which teachers can implement with the tools and equipment available in their schools.” It emphasizes that basic education institutions must develop and produce instructional materials that can enrich the learning of learners. Especially now in the new normal where they can be in a modular distance learning (MDL) or online distance learning (ODL), considering the differences on their mode of learning but still anchored on the budget of work (BOW) and most essential learning competencies (MELCs) provided by the Department of Education.

As stated on the Regional Memorandum No. 306, s. 2020 which is also known as “Guidelines on the

Implementation of MELC PIVOT 4A Budget of Work (BOW) in All Learning Areas for Key Stages 1 to 4”, the Regional Office of Region IV-A CALABARZON presents the time allocation in teaching the MELCs and enabling competencies in the different learning areas from Kindergarten to Senior High School. Particularly on the Second Quarter of Science 9, which includes the following lessons in Chemistry: Electronic Structure of Matter and Quantum Model of the Atom, Chemical Bonding and the Formation of Ions, The Carbon Atom and Organic Compounds, and The Mole Concept and Percentage Composition, which is composed of seven (7) most essential learning competencies.

This Memorandum serves as the foundation of the competencies need to be taught in the region with its allocated time. This can help the researcher identify the competencies to be used in this study, specifically in Grade 9 Chemistry, and provide the lessons which need to be discussed within the given quarter. These MELCs are extracted from the previous Curriculum Guide to help the learners on this pandemic, which also serves as the guide among teachers to address the needs of each learner amidst this new normal.

These guidelines were used to develop the contextualized video lessons and conduct this study, since there is a scarcity in the instructional materials both in the modular and online distance learning, where the schools need to reproduce modules to address the lack of printed materials. Based on the observation and personal experiences of the researcher, science is one of the subjects that obtained a low-test results from the previous school years, together with Mathematics and English. The English, Science, and Mathematics (En-Sci-Ma) subjects are considered to be the most challenging subjects among learners, since that these subjects involve comprehension and analysis, as well as computation and conceptualization that require deeper understanding and critical thinking.

The observation on test results is aligned with the same results of other science teachers in different grade levels, which is consulted by the Science Department Chair. The test results which provide the learners outcome assessment (LOA) for each quarter shows that among the field of sciences that is being taught for a school year, chemistry subject obtained the lowest test result, which is also the same with the results gathered by the science teachers in different grade levels. Grade 9 learners find chemistry subject exciting and challenging at the same time, and as described by most of them, lessons that include

computation, such as the mole concept and percentage composition are the most interesting to learn, yet difficult to understand.

The contextualized video lessons, which serve like an online lecture are intended for learners who have difficulties in science subjects, specifically in chemistry which is designed to be learner-friendly that can be used online or offline. The examples and explanations are purposively contextualized for the ease of learners, and in belief that this method of presenting the subject matter among learners can provide positive outcomes and can help them on their learning.

Research Questions

This study aims to formulate, validate, and determine the evaluation of Contextualized Video Lessons in Teaching Chemistry for Grade 9 Learners. And to be specific, it sought to answer the following questions:

1. How are the contextualized video lessons in chemistry for grade 9 learners developed?
2. How do the respondents evaluate the developed contextualized video lessons in chemistry for grade 9 learners, in terms of:
 - 2.1 Science Teachers;
 - 2.1.1 Content Quality;
 - 2.1.2 Instructional Quality; and
 - 2.1.3 Error Found?
 - 2.2 ICT Experts;
 - 2.2.1 Technical Quality?
3. How do the grade 9 learners perform before and after the exposure to the developed contextualized video lessons in chemistry for grade 9 learner with respect to the following lessons:
 - 3.1 Electronic Structure of Matter;
 - 3.2 Chemical Bonding;
 - 3.3 Carbon Compounds; and
 - 3.4 The Mole Concept?
4. Is there a significant difference on the performance of grade 9 learners before and after the exposure to the developed contextualized video lessons in chemistry for grade 9 learners, with respect to the abovementioned lessons?

Literature Review

Contextualized Video Lessons

Contextualized teaching and learning builds upon a similar concept of putting academic activities into perspective to achieve the best teaching and learning

outcomes. Contextualized learning is a practice that endeavors to link theoretical constructs that are taught during learning, to practical, real-world context. It recognizes that by embedding instructions in contexts that adult learners are familiar with, learners more readily understand and assimilate those instructions (Andriotis, 2017).

Several studies show the importance and use of video lessons in teaching, even though the results are somehow different from one another, they provide a common outcome and that is the effectiveness of video lessons. One study on The Effect of English Classroom Tasks in Contextualized and Localized on Students' Performance found that students learning depend significantly on the selection of the task in English classroom. If noncontextualized tasks are used for the teaching in localized student performance, they tend to achieve less learning as compound to those who are taught through contextualized task (Nuraida, 2019).

Content Quality

Content Quality is one of the criteria to determine the level of acceptability of contextualized video lessons in teaching chemistry for grade 9 learners, which refers to the ideas and concepts included in the material. Learning content is broadly defined as the topics, themes, beliefs, behaviors, concepts, and facts, often grouped within each subject, or learning area under knowledge, skills, values, and attitudes, which are expected to be learned and form the basis of teaching and learning (Kumar et al, 2021). In a study conducted on Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content, the utility of video lessons can be maximized by matching modality to content. By using both the audio/verbal channel and the visual/pictorial channel to convey added information, and by fitting the information to the most appropriate channel, instructors can enhance the germane cognitive load of a learning experience (Brume, 2017).

Instructional Quality

Instructional quality is an elusive concept, but efforts to define and measure it typically focus on instructional inputs, instructional outputs, or the relationship between the two. Inputs for instructional quality include behaviors, materials, and characteristics of instructors or the instructional process, usually assessed through observations, curricular artifacts, student artifacts, tests of teaching skills, or student surveys (Brown and Kurzweil, 2018).

A study conducted on Instructional Quality: Catalyst or Pitfall in Educational Systems' Aim for High Achievement and Equity, shows that the instructional practices that teachers set up have a beneficial impact on a diverse set of outcomes, ranging from individual benefits of schooling to broader societal goals like a competitive economy and societal equity. The goal of their study is to contribute to the current knowledge on instructional quality and provide direction to educational practitioners and policymakers in creating and providing effective learning environments (Bellens et al, 2019).

Error Found

This includes the conceptual, factual, grammatical, or typographical, and computational errors found in the learning material. Analyzing incorrect worked examples is especially beneficial for helping learners develop a conceptual understanding of subject matter processes. Studying their own errors can also help learners see when they have chosen incorrect strategies, improving their procedural knowledge (Digital Promise, 2020). A study conducted on Error-Discovery Learning Boosts Student Engagement and Performance, while Reducing Student Attrition in a Bioinformatics Course shows that undiagnosed conceptual error is a key factor in STEM education. Design a platform for making it easy for instructors to discover, share, reuse, remix, and write their own target problems, error models, and resolutions (Lee et al, 2018).

Technical Quality

As discussed, and explained in one article, technology bridges the gap between quarantine and teaching. Smartphones have become essential more than just being a luxury. Digital tech during this time is a need for all. They also stated the benefits of technology to learners and teachers, which are the following: equips learners for their future careers, personalizes learning and teaching approaches, drives down costs overall, and brings more learning opportunities and boosts teamwork and communication (Child Hope Philippines, 2021). In a study conducted on The Effective Use of Video in Higher Education, the researcher found that the current impact of technology on society and higher education, changes in society including the 'wired' generation and the impact on traditional roles, including course design, teaching methods and the role of the lecturer. This has resulted in many diverse types of videos which have different aspects, functions and uses within the educational context (Woolfitt, 2015).

Methodology

Research Method and Design

This study utilized descriptive-evaluative research design since the researcher developed contextualized video lessons in teaching chemistry for grade 9 learners and evaluated. According to Shuttleworth (2018), descriptive research design is a valid method for researching specific subjects and as a precursor to more quantitative studies. Thus, the aim of descriptive research is to give valuable pointers as to what variables are worth testing quantitatively. Meanwhile, according to Fox (2016), evaluative research is a type of research you can use to evaluate a product or concept and collect data that helps improve your solution. It also includes various activities, such as testing for accessibility, testing the content, assessing desirability, and more.

Since science teachers and ICT experts evaluated the developed contextualized video lessons in teaching chemistry for grade 9 learners, the researcher used the data gathered to know the evaluation of the contextualized video lessons. These data provided the results for the improvement and suggestions to be incorporated in the developed video lessons, following the criteria need to meet as stated in the Department of Education Learning Resources Management and Development System (DepEd-LRMDS).

In addition, this study also employs quasi-experimental research design among grade 9 learners of Tanay West National High School, utilizing single group pre-test and post-test. According to Thomas (2020), like a true experiment, a quasi-experimental design aims to establish a cause-and-effect relationship between an independent and dependent variable. However, unlike a true experiment, a quasi-experiment does not rely on random assignment. Instead, subjects are assigned to groups based on non-random criteria, which is a useful tool in situations where true experiments cannot be used for ethical or practical reasons. The study was utilized among grade 9 learners who are in online class, wherein, teacher-made pre-test was administered before the treatment and the teacher-made post-test after the treatment. The results gathered from the pre-test and post-test were used to determine the significant difference on the performance of grade 9 learners, before and after the exposure to the developed contextualized video lessons.

Subject of the Study

The subject of the study was the developed contextualized video lessons in teaching chemistry for grade 9 learners. Due to the scarcity of learning materials and cost of its expenses, the contextualized video lessons were used as a method in presenting the subject matter, which was done through online or offline, following the K to 12 Enhanced Basic Education Curriculum specifically the Most Essential Learning Competencies. The video lessons were intended to become contextualized so that the learners can relate on the examples given, as well as be familiar with the discussion, providing a natural way of delivering the lessons inside a classroom just like a face-to-face classes.

The respondents of the conducted study were the Grade 9 Learners of Tanay West National High School in online class, who are the same group of learners that had their online distance learning (ODL) class last school year, when they were in Grade 8 level. The respondents were composed of eleven (11) males and nineteen (19) females for a total of thirty (30) grade 9 learners. They were selected as the respondents for the purpose of implementing the research study since that they were the group of learners who were in online class last year, and they were exposed to online distance learning setup where they need to use online platforms such as Google forms, Google meet, and other online applications to submit and answer questions and activities. The evaluation of the developed contextualized video lessons in science 9 was described in terms of content quality, instructional quality, technical quality, and error found to be evaluated by at least twenty (20) Science teachers who have five (5) years of teaching experience, and ten (10) ICT experts who also have five (5) years of working experience on their field.

Procedure of the Study

The researcher followed the standard procedure in conducting this study, which started with the approved research title and colloquium. After the colloquium, revisions and suggestions from the panel were incorporated. The researcher presented the revised manuscript to the panel members and gave them enough time to check the content and attach their respective signatures. Once the manuscript was signed by all the panel members, the researcher asked for permission to conduct the study from the Office of the Graduate School.

The researcher crafted and developed the contextualized video lessons following the most essential learning competencies to be covered in the

lessons for almost four (4) months. Consultation with the science department chair and other science teachers was also conducted to provide sufficient evidence that can be used for the conduct of the study, which was obtained from the test results of the previous school years. The researcher then requested the appointment of a thesis adviser and asked for permission to conduct the study from the Schools Division Office of Rizal.

Afterwards, item analysis was utilized among the current grade 10 learners to determine the test items to be used in the study, since they have prior knowledge on the subject matter, which consist of 80 item multiple-choice test. The result of item analysis served as the baseline data in the test items which were administered among the respondents, consisting of 40 items in a multiple-choice test. After the release of results of item analysis and test construction, communication letters among school principals and science chairperson were distributed and signed. In the administration of the questionnaire checklist, copies were sent to the expert respondents through online or limited face-to-face following the strict health protocols, where they were given a week to accomplish the evaluation. The researcher retrieved all evaluation forms from the science teachers and ICT experts and organized the raw data by subjecting it to the scoring scheme, then submitted it to the statistical center for appropriate treatment and interpretation.

The administration of the developed materials was done thru online class using Google Meet as its platform among grade 9 learners within a quarter every Friday during their online distance learning (ODL) class, whereas, they have a pre-test before the treatment, and a post-test after the treatment, which was administered during their face-to-face class. The results from the pre-test and post-test were presented to the Statistical Center of University of Rizal System – Morong, to determine the significant difference before and after exposure to the developed contextualized video lessons in science 9.

After the release of the results of the evaluation of science teachers and ICT experts as well as the pre-test and post-test of grade 9 learners, the researcher accomplished Chapter 4 with the guidance of the consultant statistician in the interpretation of the tables, while the Chapter 5 with the assistance of the thesis adviser for the summary of findings, conclusions, and recommendations. The study was scheduled to final oral defense to discuss the findings and provide evidence that supports the results of the research study. After the final oral defense, revisions

were made following the comments and suggestions of the panel experts for the completion of the manuscript and subjected for final binding.

Ethical Considerations

As pertaining to ethical considerations in research, the researcher strictly followed the Republic Act No. 10173 or the Data Privacy Act of 2012, which is a law that requires any entity involved in data processing to implement and review procedures for the collection of personal data for appropriate data retention policies. Regarding this, the researcher secured a permit to conduct the study and to administer the questionnaire with ethical approval from all participating individuals and signed by their respective school principals.

To ensure research integrity, the researcher adhered to the ethical principles and professional standards by adopting the principles of truthfulness and confidentiality. This means that the researcher is bound to the concepts of truth and ensures the absence of deception. In addition, the researcher is obliged to keep the personal information with confidentiality of the persons involved in the conduct of the study.

Results and Discussion

Development of Contextualized Video Lessons in Chemistry for Grade 9 Learners

The development of contextualized video lessons in chemistry all started from the observation and personal experience of the researcher among grade 9 learners, who have least mastered skills in their chemistry subject during the second quarter of the previous school year. The lessons are included in the least mastered skills and most essential learning competencies of DepEd CALABARZON Regional Office with their corresponding budget of work.

The idea on how the learners can be assisted on their chemistry subject with the aid of technology is the primary concern of the researcher, hence, factors such as contextualization, duration, and learning modalities were considered in the development of this material. The video lessons are intended to be contextualized for the learners can relate on the examples given, especially in introducing new lessons that can catch their attention and expected that it can boost their motivation to participate in the discussion.

The developed video lessons were made using a PowerPoint presentation, supported by graphic

designs, such as images and illustrations, as well of background music to set the mood of the learners, and each was recorded using Open Broadcaster Software (OBS) Studio. The video lessons are in MP4 file format which are uploaded in a Google drive, where the learners can download the lessons, to make it available either online or offline.

Evaluation of the Science Teachers on the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners in Terms of Content Quality, Instructional Quality, Error Found and Technical Quality

Table 1 presents the evaluation of the science teachers on the developed contextualized video lessons in chemistry for grade 9 learners in terms of content quality.

Table 1. *Evaluation of the Science Teachers on the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners in Terms of Content Quality*

<i>Content Quality</i>	<i>Mean</i>	<i>VI</i>
1. Content is consistent with topics/skills found in the DepEd Learning Competencies for the subject and grade/year level it was intended.	4.70	Excellent
2. Concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives.	4.70	Excellent
3. Content is accurate.	4.65	Excellent
4. Content is up to date.	4.70	Excellent
5. Content is logically developed and organized.	4.60	Excellent
6. Content is free from cultural, gender, racial, or ethnic bias.	4.60	Excellent
7. Content stimulates and promotes critical thinking.	4.65	Excellent
8. Content is relevant to real-life situations.	4.75	Excellent
9. Language (including vocabulary) is appropriate to the target user level.	4.55	Excellent
10. Content promotes positive values that support formative growth.	4.60	Excellent
Overall	4.65	Excellent

This shows the ten indicators for content quality with a computed mean of 4.55 to 4.75 interpreted as Excellent. The result confirms that the competencies in the developed contextualized video lessons are very sufficiently covered as reflected in the criteria for content quality, which results to an overall mean of

4.65 with a verbal interpretation of Excellent, as evaluated by the science teachers.

This implies that the contents of video lessons are well-constructed in a manner that can address the needs of learners, which can provide better performance among them, and achieve the most essential learning competencies using different elements in presenting the subject matter.

This is supported by results observed in a study of (Brame, 2017) on Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content, in which the present study involved the components of effective education videos that provide impact on learners' understanding and the teaching-learning process as a whole. Since watching a video can be a passive experience, it is important to keep in mind the three key components of effective education videos such as cognitive load, elements that impact engagement, and elements that promote active learning.

Table 2. *Evaluation of the Science Teachers on the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners in Terms of Instructional Quality*

<i>Instructional Quality</i>	<i>Mean</i>	<i>VI</i>
1. Purpose of the material is well defined.	4.70	Excellent
2. Material achieves its defined purpose.	4.70	Excellent
3. Learning objectives are clearly stated and measurable.	4.70	Excellent
4. Level of difficulty is appropriate for the intended target user.	4.55	Excellent
5. Graphics / colors / sounds are used for appropriate instructional reasons.	4.50	Excellent
6. Material is enjoyable, stimulating, challenging, and engaging.	4.55	Excellent
7. Material effectively stimulates creativity of target user.	4.55	Excellent
8. Feedback on target user's responses is effectively employed.	4.60	Excellent
9. Target user can control the rate and sequence of presentation and review.	4.60	Excellent
10. Instruction is integrated with target user's previous experience.	4.60	Excellent
Overall	4.60	Excellent

This table shows the ten indicators for instructional quality with a computed mean of 4.55 to 4.70 interpreted as Excellent. This results are an overall mean of 4.60 with a verbal interpretation of Excellent, which proves that the competencies in the developed contextualized video lessons are very sufficiently covered as reflected in the criteria for instructional quality, as evaluated by the science teachers.

This implies that the instructions made in the contextualized video lessons can help the learners on their study, which is aided with graphic designs, images, illustrations, and background music to enhance the teaching-learning process.

This confirms the study of (Ou et al, 2019) on Designing and Developing Video Lessons for Online Learning: A Seven-Principle Model, where the developed contextualized video lessons were guided by principles that established and enriched the learning experiences of the learners. To ensure learner satisfaction and enhance the online learning experience, it is vital that the instructional design and video production are guided by established principles to create and produce effective videos.

Table 3. *Evaluation of the Science Teachers on the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners in Terms of Error Found and Other Findings*

<i>Error Found and Other Findings</i>	<i>Mean</i>	<i>VI</i>
1. Conceptual errors.	4.60	Not Present
2. Factual errors.	4.55	Not Present
3. Grammatical errors.	4.50	Not Present
4. Computational errors.	4.60	Not Present
5. Obsolete information.	4.60	Not Present
6. Typographical and other minor errors (e.g., inappropriate, or unclear illustrations, missing labels, wrong captions etc.).	4.45	Not Present
Overall	4.55	Not Present

This table shows the six indicators for error found and other findings with a computed mean of 4.45 to 4.60 interpreted as Not Present. The result confirms that the competencies in the developed contextualized video lessons are very sufficiently covered as reflected in criteria for error found and other findings, which results to an overall mean of 4.55 with a verbal

interpretation of Not Present, as evaluated by the science teachers.

This implies that the developed contextualized video lessons are well-planned and have a minimal error, which includes information that is factual and up to date with its correct grammar and computation. This can provide better discussion that can help the learners to understand the lessons and explain ideas that are easy to understand.

This supports the study of (Aboumatar et al, 2021) on Perspective on Reducing Errors in Research, since the evaluation of the science teachers on error found shows that error is not present in the developed contextualized video lessons, which is the main goal of a quality education. A study must promote a culture that encourages admission of errors, discussion of underlying causes, and learning from them. This would require a collective ongoing effort from research mentors to acknowledge that errors do occur in well conducted research, encourage reporting of those errors, and support those who report them.

Table 4. *Composite Table on the Evaluation of the Science Teachers on the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners*

	<i>Mean</i>	<i>VI</i>
Content Quality	4.65	Excellent
Instructional Quality	4.60	Excellent
Error Found and Other Findings	4.55	Not Present
Grand Mean	4.60	Excellent

This results to a computed mean of 4.65 and 4.60 to content quality and instructional quality, respectively, with a verbal interpretation of excellent, while a computed mean of 4.55 to error found and other findings with a verbal interpretation of Not Present. This provides a grand mean of 4.60 for content quality, instructional quality, error found and other findings with a verbal interpretation of Excellent.

This implies that the developed contextualized video lessons are aligned with the criteria as suggested from the DepEd Learning Resources Management and Development System, and these are crafted in a manner that can boost the motivation and enhance the understanding of learners on their chemistry subject. The developed contextualized video lessons in terms of content and technical quality, as well as error found, and other findings suggest that the materials can

improve the learner's performance and provide them various options and activities to enrich their learning.

This confirms the study of (Sogunro, 2017) on Quality Instruction as a Motivating Factor in Higher Education and the study of (Kosterelioglu, 2016) on Student Views on Learning Environments Enriched by Video Clips, on which, the developed material was evaluated by the science teachers and found that it follows the indicators that need to meet as regard to educational video lessons, resulting to an excellent rating and not present for the error in the material.

Student's motivation to learn is piqued by the quality of the instruction received, that is, when the quality of instruction is high, a student's motivation to learn increases. Video clips as supporting materials during classes had the greatest effects on providing memorability, facilitating learning, arousing interest towards educational class, and ensuring student interest or attention that ensured relevance by providing visual and animation support.

Evaluation of the ICT Experts on the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners in Terms of Technical Quality

This table 5 shows the eleven indicators for technical quality with a computed mean of 4.70 to 5.00 interpreted as Excellent. The result confirms that the competencies in the developed contextualized video lessons are very sufficiently covered as reflected in the criteria for technical quality, which shows the different elements in creating educational video lessons such as audio, graphic designs, illustrations, and sound effects.

This implies that the developed material is congruent to the technical aspects of creating educational video lessons, which contributes to the teaching- learning process. This can provide visual presentations that are easy to interpret and understand with audio that can guide the learners on their lessons.

This is supported by results observed in a study of (Brame, 2017) on Effective Educational Videos, since that the contextualized video lessons provide pictures that enriched learning with the video clip of the teacher who discussed the lesson and guide the learners to answer and follow the procedures stated on the developed material. Animation of a process on screen while narrating it uses both channels to elucidate the process, it can also be helpful to provide an illustration and visual elements that add to the lesson, which can not only promote student understanding but also engagement with the lesson.

Table 5. *Evaluation of the ICT Experts on the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners in Terms of Technical Quality*

<i>Technical Quality</i>	<i>Mean</i>	<i>VI</i>
1. Audio enhances understanding of the concept.	4.70	Excellent
2. Speech and narration (correct pacing, intonation, and pronunciation) is clear and can be easily understood.	4.90	Excellent
3. There is complete synchronization of audio with the visuals, if any.	4.70	Excellent
4. Music and sound effects are appropriate and effective for instructional purposes.	5.00	Excellent
5. Screen displays (text) are uncluttered, easy to read, and aesthetically pleasing.	4.70	Excellent
6. Visual presentations (non-text) are clear and easy to interpret.	4.90	Excellent
7. Visuals sustain interest and do not distract user's attention.	4.90	Excellent
8. Visuals provide accurate representation of the concept discussed.	4.80	Excellent
9. The user support materials (if any) are effective.	4.80	Excellent
10. The design allows the target user to navigate freely through the material.	4.70	Excellent
11. The material can easily and independently be used.	4.90	Excellent
Overall	4.82	Excellent

Level of Performance of Grade 9 Learners Before and After Exposure to the Developed Contextualized Video Lessons in Chemistry with Respect to the Different Lessons

Table 6. *Level of Performance of the Learners Before and After Exposure to the*

Developed Contextualized Video Lessons in Chemistry for Grade 9

<i>Topic</i>	<i>Before</i>			<i>After</i>		
	<i>Mean</i>	<i>Sd.</i>	<i>VI</i>	<i>Mean</i>	<i>Sd.</i>	<i>VI</i>
Electronic Structure of Matter	4.23	1.98	Satisfactory	8.10	1.32	Outstanding
Chemical Bonding	3.10	1.13	Fair	7.17	1.84	Very Satisfactory
Carbon Compounds	4.10	1.35	Satisfactory	8.83	1.42	Outstanding
The Mole Concept	5.50	1.55	Satisfactory	8.13	1.04	Outstanding
Total	16.93	3.10	Satisfactory	32.23	3.95	Outstanding

This table shows the performance of learners before and after exposure to the developed contextualized video lessons in chemistry for grade 9 with the topics

electronic structure of matter, chemical bonding, carbon compounds, and the mole concept. As regards to the computed mean of the four topics in chemistry, chemical bonding obtained the lowest mean, before and after exposure to the developed contextualized video lessons. However, the increase on the computed mean on the topic chemical bonding is evident, with a mean difference of >4 , which provides the idea that the developed material helps the learners in understanding the concept in this lesson. Meanwhile, an increase on the computed mean for the topics electronic structure of matter, carbon compounds, and the mole concept is also evident, with a mean difference of <4 , which also suggests that the developed material help the learners on their lesson and improves their learning.

This results provide an idea that the level of performance of the learners before exposure to the developed contextualized video lessons is varied as shown in the computed standard deviation and computed mean, where the topic chemical bonding obtained the lowest, and electronic structure of matter as the highest standard deviation. Meanwhile, the level of performance of the learners after the exposure to the developed contextualized video lessons is also diverse as shown in the computed standard deviation and computed mean, where the topic the mole concept obtained the lowest, and chemical bonding as the highest standard deviation.

This provides an idea that the developed contextualized video lessons can enhance the understanding of the learners on their subject matter, providing the concepts, illustrations, and computations that can help to further explain the lessons, as well of boosting their motivation to listen and participate in class discussions, which promotes quality education and self-independence.

This is aligned with the study of (Fernandez, 2019) conducted on Effectiveness of Video-Assisted Instruction in Teaching Grade 6 Science, since both studies implement educational video lessons to aid the learners with a follow-up enrichment activities during their face-to-face classes, which focuses on science subject. Video-assisted instruction could enhance the performance of learners in science and can provide the most effective instruction to improve the performance of the learners. Based on the study conducted, the improvement is evident in the performance of the three groups in their pre-test and post-test results, which suggests that those instructions are all effective with the combination of video-assisted and traditional instructions.

Significant Difference on the Performance of Grade 9 Learners Before and After the Exposure to the Developed Contextualized Video Lessons in Chemistry

Table 7. *Significant Difference on the Performance of Grade 9 Learners Before and After the Exposure to the Developed Contextualized Video Lessons in Chemistry for Grade 9 Learners*

Topic		Mean	Sd.	Mean Diff	t	df	p-value	H ₀	VI
Electronic Structure of Matter	Before	4.23	1.98	3.867	9.947	29	.000	R	S
	After	8.10	1.32						
Chemical Bonding	Before	3.10	1.13	4.067	11.143	29	.000	R	S
	After	7.17	1.84						
Carbon Compounds	Before	4.10	1.35	4.733	13.084	29	.000	R	S
	After	8.83	1.42						
The Mole Concept	Before	5.50	1.55	2.633	8.056	29	.000	R	S
	After	8.13	1.04						
Total	Before	16.93	3.10	15.300	19.238	29	.000	R	S
	After	32.23	3.95						

This table shows that there is significant difference on the performance of grade 9 learners before and after exposure to the developed Contextualized Video Lessons in Chemistry for Grade 9 Learners with respect to the topics: electronic structure of matter, chemical bonding, carbon compounds, and the mole concept since the computed probabilities are all 0.000 which is lesser than 0.05 level of significance resulting the rejection of the null hypothesis.

The mean differences among the four topics were evident before and after exposure to the developed contextualized video lessons, where the topic the mole concept obtained the least mean difference of 2.633, while carbon compounds obtained the highest mean difference of 4.733. Overall, the mean differences on the four topics in chemistry show that there is an increase on the performance of the learners before and after the exposure to the developed material.

This implies that the developed contextualized video lessons have improved the performance of the learners in their chemistry subject, providing the idea that this material can enhance their understanding, boost their motivation, and can be used at their most convenient time if they needed.

This confirms the study of (Bulla, 2021) on Integration of Video Lessons to Grade 9 Science Learners Amidst COVID-19 Pandemic, since that the present study involved the use of video lessons in teaching chemistry subject for grade 9 learners, which aid the learners on their lessons and help them improved their performance in chemistry subject. Based on the study conducted, video lessons integration to grade 9 have a

more positive correlation than modular intervention of the same grade level. It also suggests that video lessons were more effective in all learning competencies though modular approaches in some areas were also effective to students learning during the pandemic, and these video lessons can help learners better understand and comprehend the lessons.

Conclusion

In the light of the foregoing findings, the following conclusions were drawn: (1) The developed Contextualized Video Lessons in Teaching Chemistry for Grade 9 Learners can be used as a supporting instructional tool among learners who have difficulties on their chemistry subject, which can be utilized either online or offline. (2) The developed material can help the learners to improve their performance in their science subject, which can aid them to obtain better scores on their activities and quizzes, and to boost their motivation on having a better understanding of the lessons.

The following recommendations are hereby offered in alignment with the findings and conclusions that were drawn: (1) The contextualized video lessons in teaching chemistry for grade 9 learners can be assessed based on its effectiveness and can be used as an instructional material by the Science teachers at Tanay West National High School, or in different schools at Tanay, Rizal. (2) Future researchers may consider the development of contextualized video lessons in other field of Science, such as Earth Science, Physics, and Biology for grade 9 learners to enrich their learning using other variables, and other grade levels in Junior High School can also develop their contextualized video lessons to provide additional learning materials in the teaching-learning process anchored from the K to 12 Curriculum.

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