E-Learning Material in Earth and Life Science
for Struggling Learners

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Abstract

The purpose of the study is to design and validate e-learning materials for a few selected Earth and Life Science disciplines. It concentrated on figuring out how the e-learning content would help increase the learners' conceptual comprehension and their perception of the intervention material's effectiveness.

The area of investigation was limited to four (4) areas of investigation: 1) Determine the level of quality of the respondents on the use of the E – Learning Material in Earth and Life Science for Struggling Learners in terms of its objective, content and exercises, 2) Determine the level of acceptability of the respondents on the use of the E – Learning Material in Earth and Life Science for Struggling Learners in terms of its efficiency, usability and adaptability, 3) Know the mean score performance of the control and experimental group on the second quarter topic: matter in the use of E – Learning Material in Earth and Life Science in terms of Pre – Test and Post – Test, and 4) Determine if there is a significant difference between the pre-test performance and posttest performance of the control group and experimental group.

It was founded on the level quality in terms of objectives, content, and exercises, it was determined that the e-learning material was highly acceptable to teachers and students as an intervention for the struggling learners. The e-learning material was successful in enhancing the students' competencies in Earth and Life Science disciplines as evidenced by the students' improved performance on the post-test.

It was revealed that the e-learning material was highly acceptable to teachers and students as an intervention for the struggling learners in terms of acceptability based on its efficiency, usability and adaptability. According to the students' increased performance on the post-test, the e-learning material was effective in improving the students' competences in Earth and Life Science subjects.

It was described that the mean score performance in the pretest of the control and experimental group were both average. While the mean score performance in the posttest of the control and experimental group were described as good.

A significant improvement in the students' performance was revealed by the study. Based on the results of the pre-test and the post-test, there was a significant difference in the students' performance of the control and experimental group.

Based from the findings of the study the author of this research concluded that there is a significant difference between the posttest mean score of the control and experimental group, hence, the null hypothesis stating that there is no significant difference is hereby rejected.

The researcher recommends to change the research paradigm. Investigate the potential modifying impact of learners' academic abilities and parental support on the impact of employing science-related films as a motivating and cognitive teaching strategy during a certain grading period.

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1. Introduction

E- Learning Materials such as Computers and Internet Technologies to deliver a broad array of solutions to enable learning and improve performance. A virtual classroom is an example of E learning wherein some instructors remotely and in real time to a group of learners using a combination of Materials. Trainers can easily adapt a set of provided resources to deliver classroom session using high Quality content which the students much appreciated with the instructor's effort.

E learning materials gives more benefit for students. Nowadays, learners want relevant, mobile self-paced, and personalized content. This need is fulfilled with the online mode of learning. The online method of learning is best suited for everyone. These digital techniques had led to remarkable changes in how the content is accessed, discussed, and shared. Depending on their availability and comfort, many people choose to learn using e-learning materials, this type of techniques can entertain the viewers or listener that lead them to focus their attention in the instructor's or teacher's traditional classroom teaching strategies

E- Learning is a paperless way of learning. It also helps to protect the environment to a lot of extent. E-Learning can be considered as evolution or improvement of distance learning which has always taken advantage of the latest materials to emerge in the context of technology for structuring education.

E-Learning is a way to provide a quick delivery of lessons. As compare to traditional classroom teaching strategies. E-Learning in schools have an important and positive impact on teaching and learning through experiencing. Building upon earlier work by John Dewey and Kurt Levin, American educational theorist David A. Kolb believes "learning is the process whereby knowledge is created through the transformation of experience".

A struggling learner has to work harder than others around him in order to accomplish the same task or learn the same thing. The child may be a year or more behind grade level in one area or in all subjects. According to an ongoing study released by the Bill & Melinda Gates Foundation, when teachers personalize learning experiences based on students' unique needs, great things can happen. The study found that students whose teachers used assessment data to customize their learning significantly improved in reading and math over similar schools not employing personalized instructional approaches. That is why, I came up having the idea of an E – Learning material that can help struggling learners so that they can easily learn the lesson through videos and activities in the most basic and step by step process. Through the E – Learning material they can easily cope with the lesson and that they will not be left behind.

Beihler and Snowman (2012) assert that instructors can boost students' motivation to learn. Each subject should be interesting, and teachers should make every effort to make learning active, dynamic, adventurous, social, and useful. They can do this by considering the educational options that students enthusiastically embrace when given the opportunity to make their own decisions. Subjects become attractive to children if they have the opportunity to manipulate and construct objects, observe, conduct research, use their creative thinking to solve problems or riddles, and create designs to address the issue at hand. The several process skills that have been emphasized can be very helpful in sustaining interest in science as a field of study.

The goal of education is to create well-rounded, reality-ready students. Additionally, it gives students the skills they need to continue succeeding in their chosen field beyond graduation. The Republic Act No. 10533's Section 2 states as a result, "The State shall establish a viable basic education system that will produce productive and responsible individuals endowed with the fundamental competences, skills, and values for both lifelong learning and work." The Department of Education's (DepEd) budget, however, is insufficient to meet every classroom's needs given the state of the Philippine educational system at the moment; there is a nationwide shortage of classrooms, as well as a lack of appropriate instructional materials and other tools that teachers can use in the classroom. One strategy for dealing with this issue is to take part in enrichment and intervention programs.

Background of the study

Learning professionals, creators of visual media have long struggled to eliminate the passivity of the viewing experience. Sitting back can lead to disinterest, distraction and a desire for something more immersive. To combat this, we've seen a history of 3D, IMAX, surround sound and other attempts to engage and involve the viewer in what's displaying on-screen. In 1977, the QUBE interactive cable TV system offered subscribers, "a chance to shout back at the world" through a push-button remote control. The "ability to interact with what is happening on the screen is why QUBE marks the beginning of the era of participatory as opposed to passive television," claimed the short-lived operation.

Books, audio-visual, software, and hardware of educational technology are all examples of instructional resources, according to So Ang Kuh (2012). He also thinks that good teaching, which can improve student learning and performance, can be influenced by the accessibility, adequacy, and relevance of the educational materials used in classrooms. In order to deliver a high-quality education, Ang Kuh's understanding of the significance of linking instructional resources to students' academic performance is essential. These concepts constitute the basis for the contribution of instructional materials to academic achievement in community secondary schools in the Rombo district. High productivity and effectiveness in teaching and learning activities. I think the first step is having access to enough and high-quality teaching resources, which should be created well in advance of any in-class discussions.

This study shows that many Professionals create a visual media to eliminate the passivity of viewing of the listeners. It helps the instructor to entertain the listener and focus them in the Presentation flash in the Screen using an E- learning Materials. It also helps the instructor to operate easily his or her Presentation they only control the system to operate and to make the Interactive Videos Accomplished better.

As stated in the Republic Act No. 10533 also known as "Implementing Rules and Regulation (IRR) of the Enhanced Basic Education Act of 2013" section 5 basic education is intended to meet basic learning needs which provides the foundation on which subsequent learning can be based. This program can strengthen the Science Education that will allow the learners to learn the skills and knowledge appropriate in the developmental and cognitive stage. It also strengthens the retention, mastery and skills of the topics.

Presidential Decree No. 6-A known as the Educational Development Act of 1972, Section 5(a) titles "Educational Development Projects" include design, utilization and improvement of instructional technology and development of textbooks and other instructional materials to attain one of the objectives which is to acquire the essential educational foundation for the development of a productive and versatile citizen. With the idea of the E – Learning material it might be a help for the students to have a good educational foundation.

The Department of Education issues DepEd Order no.31 s.2020 or the Interim Guidelines for Assessment and Grading in light of the Basic Education Learning Continuity Plan. This will serve as a guide for teachers on the assessment of student learning and on the grading system to be adopted this school year 2020-2021. Through the grading system set by the Department of Education the researcher came up with the idea of using the the final grade of the learners as the basis for the chosen respondents.

Developing an E – Learning would help the students to attain a much higher grade than the usual grade they have. It focuses on the role of the teacher as a guide to the student to explore the topic through their own using the e – learning material. The researcher thought that the application will be great help for both the teacher and the learners to improve their performance in Science.

E-learning material can also be a strategy that the teachers can use to help the students who are always absent and those that have low and failing grades. It will be use as a supplemental material that can help learners who missed lessons or activities during the class discussion.

Theoretical framework

To explicitly understand the nature and structure of this study the following theories help specify which key variables influence a phenomenon of interest and highlights likewise, examine these variables that might be different and under what circumstances. E-learning can also be termed as a network enabled transfer of skills and

knowledge, and the delivery of education is made to a large number of recipients at the same or different times. (Bennett & Coleman, 2019).

The law of practice/ exercise of Thorndike supports this study. This law has two aspects and as such has two related or allied doctrines, (a) Law of Use and (b) Law of Disuse. In Science, the repetitions of activities fix knowledge and skills to be learned. It is similar with the saying, "Practice makes perfect". That is why, whenever a student doesn't practice or always do the activity or using the skill it weakens and eventually forgot how or when to use the skill.

According to John Dewey, learning is best by experience. Students are able to understand and improve their Science skills and performance if they closely engage in different exercises. For this study, using an e – learning as supplementary materials might be an effective way to help students who are struggling in science lessons.

Because the ideas and principles behind the subject are too abstract, dealing with science subjects appears to be so challenging to most students. The main reason why science lessons are difficult for children to understand is because the material is given in an overly abstract or symbolic way. As a result, pupils felt that the material's abstract nature was always constrained to the four corners of the classroom. Since the objects under study are invisible to the human eye, understanding and connection are limited. Every learner has a different learning style, so teachers must devise a better and more effective method of instruction that will increase students' short-term recall, long-term comprehension, and overall satisfaction.

According to Longworth & Davies definition, each individual has a learning potential. Given learning opportunities, discarding learning barriers and providing access to education will encourage and motivate learning throughout life. The human being's experience incorporates both continuity and change, hence the need for lifelong learning, which is a process, a continuum of interdependent elements.

Teachers' strategic component in organizing and providing education, according to Euni (2012), is instructional resources. This is because they assist in developing a notion that the instructor could not develop without the assistance of instructional materials. This permits pupils to learn more easily, which positively impacts their academic achievement.

In coming up with the idea of designing the instructional materials, the researcher referred to some models and theories such as that of Prado (2015) which discusses four steps intended to respond to the learning needs of the students. The present study is adapting the instructional design theory. According to Spencer (2019) instructional design theory is the study of how to best design instruction so that learning will take place. According to the language learning theories, learners acquire language primarily from the input they receive, and they must receive large amounts of comprehensible input before they are required to speak.

In addition, the idea of self-efficacy, according to Albert Bandura's theory, is described as people's belief in their capacity to undertake a course of action necessary to complete a certain job (Bandura, 1977). Self-efficacy is one of the most powerful motivational forces. Students are more motivated to engage in and complete an activity when they feel they are capable of completing it well. Numerous studies have demonstrated that high-efficacy students prefer to participate in more complex projects, work harder, persevere longer in the face of challenges, and do better than low-efficacy students (Bandura, 1997). Self-efficacy is increased when you perform well on comparable activities, but it is lowered when you fail. Self-efficacy can also be boosted by watching similar peer's complete similar activities.

Expectations that one can achieve the same thing as another person are formed as a result of such encounters. Self-efficacy can be enhanced when a trustworthy individual, such as a teacher, persuades or encourages pupils to do a difficult job, notwithstanding its limited effectiveness. Finally, emotional states like worry and physiological indicators like perspiration might affect self-efficacy by communicating that students are unable to complete the activity.

The operant conditioning hypothesis of BF Skinner is based on the idea that learning occurs when overt behavior changes. When it comes to learning science, one learns to apply science idea through making an utterance (operant) that is rewarded by a reaction from another person. If the outcome of the mimicked conduct is unfavorable, the activity is not repeated; if the response is positive, the behavior is repeated. The habit of formation is formed as a result of repetition.

Dewey's psychological theories of learning referred to as learning by doing (1938) cited from Rokooei,

et. al (2021), is predicated on the notion that the learner works independently and checks the accuracy of his responses by comparing them to the right ones. Additionally, it provides learners with a mechanism for rapid feedback and allows learners to go at their own pace and recycle if required.

This theory is related to the present study since the proposed material is designed as self-paced within a planned sequence of learning activities aimed at assisting learners in achieving certain well-defined goals during their phase.

Cognitive psychologists such as Vygotsky and Piaget developed ideas to explain why traditional perspective and mechanical techniques of teaching science are ineffectual by the middle of the twentieth century. These ideas are the foundation for natural – strategies that would help learners gain the knowledge to understand science concepts.

Conceptual framework

The researcher conceptualized a research paradigm that led to a better understanding of the development and implementation of the E-Learning Material for the Struggling Learners.
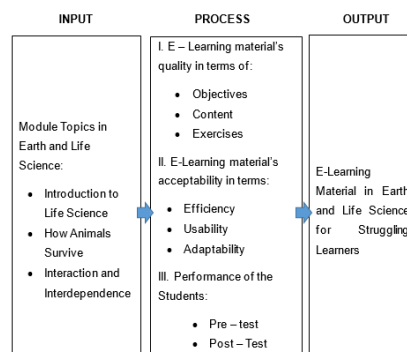

Figure 1. Paradigm of the Study

The figure above shows the Paradigm of the Study. Frame 1 contains the different topics in Earth and Life Science, Frame 2 contains the terms to be test in the tool and lastly, the Frame 3 that contains the output of the study which is the E – Learning Material in Earth and Life Science for Struggling Learners.

Objective of the problem

It focuses on the utilization of the E – Learning Material in Earth and Life Science for Struggling Learners. This study aimed to determine the effectiveness of the e – Learning material in the Grade 11 student of Lumban Senior High School.

1. Determine the level of quality of the respondents on the use of the E– Learning Material in Earth and Life Science for Struggling Learners in terms of its objective, content and exercises.

2. Determine the level of acceptability of the respondents on the use of the E – Learning Material in Earth and Life Science for Struggling Learners in terms of its efficiency, usability and adaptability

3. Know the mean score performance of the control and experimental group on the second quarter topic: matter in the use of E – Learning Material in Earth and Life Science in terms of:

    3.1 Pre – Test

    3.2 Post – Test

4.Determine if there is a significant difference between the pre-test performance and posttest performance of the control group and experimental group.

Hypothesis

There is no significant relationship between the e – Learning material and academic performance of the student.

Significance of the Study

The findings of this study may serve as data bank for the following sectors in their decision-making:

Teachers and Instructors. The material will contribute for them to have a lively discussion with their class. The use of the e – Learning can help them improve their MPS result.

Students. The material will help them improve their academic performances.

DepEd. The material will give the idea that new technologies should be applied to the discussion for the student to interact or cooperate during class discussion.

Researchers. The material will give them the idea to make new e-Learning material for different subject or lesson.

School. The material will help them make e – Learning material for their subject.

Scope and limitation of the study

This study focused on the effectiveness of e-Learning material in the topics under Earth and Life Science for Struggling Learners.

The respondents will be composing of 50 Grade 11 learners came from 5 sections who takes up the subject Earth and Life Science in Lumban Senior High School. The chosen respondents got the final grade of 79 and below on the said subject.

This study was limited on those aspects mentioned. It includes selected science teachers and students in Lumban Senior High School. This aimed to serve as the foundation or the basis for enhancement program. This study will be conducted during the school year 2021 – 2022.

4. REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents the related literature and related studies which are found to have significantly guided of the specific research.

4.1 Related Literature

Oha, A. (2016), the influence of first language in the learning of second language has been of an intense debate during the past years, resulting in the prevalence of Error Analysis over Contrastive Analysis. A great number of empirical studies indicated that neither L1 nor L2 was always responsible for learners' errors. Contrastive Analysis and Error Analysis have also shown their own weaknesses in giving interpretations to the errors made by the learner, paving the way for the new wave of studies into interlanguage called Learning Strategy. Learning Strategy which has been in vogue for the last years, has witnessed differing conceptualization and empirical outputs by different researchers and linguists from various language backgrounds. It all boils down to the fact that there are many points in this theory which are not clear. In the light of this, this study aims at reviewing and discussing the various views on learning strategies in describing and explaining learners' errors in the process of language acquisition. Therefore, theoretical foundations, theoretical assumptions, empirical works, limitations and significance of this theory are discussed in detail. This review reveals that learning strategy theory projects language learning or acquisition as a universal process.

According to Lawless (2019) blogbook's entitled Applying Cognitive Learning Theory to Your Corporate Learning Strategy, explains Cognitive Learning Theory on how individual process information when learning occurs. When thinking occur, many are remembering being taught in this way: a teacher stood at the top of the classroom and lectured on a subject. Before most of the teacher uses this method for almost every subject and in the vast majority of cases, a student's success was measured by how much they could remember on exam day. Passive learners are result of this type of teaching and learning process. The active participant is considered to be the teacher, the one who imparts knowledge to the learners.

Gretter, S (2012) focuses her The Cognitive Implications of Teaching Literature in understanding how the human brain processes stories and relates them to real life functioning has important implications for many disciplines including education. Educators help students enhance the necessary abilities for critical thinking. Because educators are main contributor in this process, they need to focus on students' cognition in their everyday work and at diferent levels, including the classroom environment, planning, and content of lessons in order to enhance students' engagement and life-long learning. Literary theories, strategies, and approaches can help instruct students to elaborate on their understanding of stories. Nevertheless, research suggests that those strategies are more efficient when explicitly taught through models and specifc examples of approaches.

The purpose of this study is to explore the learning effect related to different learning styles in a Web-based virtual science laboratory for elementary school students. The online virtual lab allows teachers to integrate information and communication technology (ICT) into science lessons.

According to Chia-juiYu Y (2018), The results of this experimental teaching method demonstrate that: (a) students in the experimental group using the online virtual lab achieved better grades than those in the control group under traditional class instruction, (b) in the experimental group, grade achievements of students having different learning styles were not significantly different from each other leading us to conclude that the Web-based virtual learning environment is suitable for various learning styles, (c) students with the "accommodator" learning style made the most significant achievements in this study, the scores obtained by the experimental group being remarkably better than those in the control group, and (d) up to 75% of the students surveyed indicated that they preferred using the Web-based virtual lab to reading textbooks only. The results of the experimental teaching and the survey show the feasibility and effectiveness of the Web-based learning environment being studied. It encourages further development of the Web-based virtual lab.

Due to the rapid growth of internet technology, universities around the world are investing heavily in e-learning systems to support their traditional teaching and to improve their students' learning experience and performance. However, Kattoua T. (2016), said that the success of an e-learning system depends on the understanding of certain antecedent factors that influence the students' acceptance and usage of such e-learning systems. This study aims to provide a discussion of the current e-learning environments including their characteristics, limitations, advantages and the major factors that affect the acceptance of such technologies. It is concluded that a successful e-learning system should consider the personal, social, cultural, technological, organizational and environmental factors.

Gamification analyst, consultant, designer, professor, Instructional Designer. Karl Kapp helps people understand the convergence of learning, technology, games, and gamification through fun, laughter, and insight (all based on a healthy dose of evidence-based practices). Kattoua T. (2016), is a professional in the field of learning and eLearning with a focus on interactive learning, games, and gamification, and the author of the book Gamification of Learning and Instruction. He is an Instructional Technology Graduate Professor at Bloomsburg University in Bloomsburg, PA., and the Director of Bloomsburg's Institute for Interactive Technologies.

Founder of the eLearning Industry's network, Pappas C. (2017), which is the largest online community of professionals involved in the eLearning field. Christopher holds an MBA and a MEd (Learning Design) from BGSU. Furthermore, he is an eLearning analyst and blogger, with great knowledge and experience in Inbound Marketing. Through the knowledge-sharing platform functioning under the name of eLearning Industry he is giving learning facilitators and all others interested the information needed to stay up to date with the latest industry news and technologies, and find projects or jobs.

According to Fai & Tommy (2016) as stated by Yong, S. (2018) affirms that the relationship between teacher proficiency and teachers' inferences of students' self-concept and knowledge. The study discovered that

the more qualified teachers were, the better they were at inferring pupils' self-concept and knowledge. Furthermore, teacher competence in classroom procedures contributed more to predicting teachers' inferences of students' self-concept and knowledge than did teacher competence in interpersonal skills.

It is not uncommon that researchers face difficulties when performing meaningful cross-study comparisons for research. Research associated with the distance learning realm can be even more difficult to use as there are different environments with a variety of characteristics. We implemented a mixed-method analysis of research articles to find out how they define the learning environment. In addition, we surveyed 43 persons and discovered that there was inconsistent use of terminology for different types of delivery modes. The results reveal that there are different expectations and perceptions of learning environment labels: distance learning, e-Learning, and online learning, Moore, J., Gaylen, K., (2011).

Long ago, the education system in the Philippines was one of the shortest in the world wherein formal education was only required for 10 years (6 years of primary school and 4 years of high school). In 2012, the government introduced new program requiring students to attend school from kindergarten (around age 5) to grade 12 (around age 18). This meant that the new legislation added 2 years to the curriculum before students could finish high school. Since then, the education system in the Philippines became more similar to American K-12 schooling (Granada, A. 2021)

Furthermore, the Learning Information System or LIS is an modern tool that the Department uses to manage information with the aim of promoting transparency, informed decision making, and empowerment in any levels of the organization and develop facilities which can improve data accuracy and system security (Llego, M. A. 2018).

An official of the Department of Education (DepEd) said on Monday that class size reduction is key to improve the learning environment of students, especially in highly urbanized areas. Undersecretary for Planning and Field Operations Jesus Mateo said the classroom-pupil and teacher-studio ratios in most cities have changed greatly in recent years. He said such changes "might have been caused by overpopulation among other contributing factors. Mateo quoted House Bill 473 or An Act Regulating Class Size in All Public Schools and Appointing Funds Thereof which says one teacher shall handle a standard class size of 35 learners with a maximum of no more than 50 students (Montemayor, M. T. 2018).

Cognitive domain of learning in psychology is the process by which a similarly lasting modification in potential behavior happens due to a practice exploration and experiences. Learning is discern from behavioral changes coming from such processes as maturation and illness but does apply movements or motor skills. There is proof that neurotic symptoms and pattern of mental illness are also a type of learned behavior. However, learning happens throughout life in animals and learned behavior accounts for a huge proportion of all behavior in higher animals especially in humans, Tighe T. (2018).

As LLego, M. A. (2022) stated that Distance Learning refers to a learning delivery modality where teacher and learners are purely remote from each other during instruction. Moreover, modular Distance Learning Involves individualized instruction that allows learners to use self-learning modules (SLMs) in print or digital format/electronic copy. The teacher is responsible for keeping track of the students' progress. Learners can contact the teacher via e-mail, phone, text message/instant messaging, and other methods. If at all practicable, the teacher will make home visits to students who require remediation or support. Any member of the family or other community stakeholder should volunteer to be a teacher.

It can be said that in learning process, students engage in activities through which they enhance skills and acquire concepts. From this statement it is know that in learning process, learners construct and build on their prior knowledge through activities chosen to simulate those that will be encountered in real life. (Cooperstein & Weidinger; 2014).

As stated by Abuga, A.P. (2019) asserts that Competency-Based Learning Material (CBLM) is a student-centered learning technique in which students are given the resources they need to learn at their own speed and choose their own learning sequence (Abuga, A. P. 2019).

Also, K-12 Teachers Guide (TG) and Learners Material (LM) are resources used in preparing daily lessons. Additional resources from the Department of Education contain materials from the Learning Resources Management and Development System (LRMDS) portal, textbooks, and others supplementary materials, whether digital, multimedia, or online, including those that are teacher-made. But, these materials should be used by

teachers as resources, not as the curriculum. With a lesson plan, teachers can forecast which parts of the lesson learners will have difficulty understanding. Teachers can then formulate strategies that help learners learn, build learners' understanding and respond to learners' needs. This means that a teacher can make a lesson plan but must remain open to the possibility of adjusting instruction to respond to the needs of learners (DepEd Teachers Club 2018).

The ability of making learning more interesting, educators and researchers have been exploring other pedagogical potentials of computer games. How to employ games for constructivist learning and teaching has become an attention in the field of education and game design in recent years. This article gives an introduction to game-based learning. On top of discussing games' intrinsic educational traits from the motivational, cognitive and socio-cultural perspectives, we also review two recent foci of game-based learning. The first one is "education in games" which is an approach for adopting existing commercial games for educational use. The second is "games in education" in which the games are designed specifically with underlying pedagogy for some curricula, Jong, M., (2018).

Additionally, Learning Modality are the sensory channels or pathways through which individuals give, receive, and store information. Perception, memory, and sensation comprise the concept of modality. Visual, auditory, tactile/kinesthetic, smell, and taste are examples of modalities or senses (Rose, C. 2016).

The four widely accepted learning modalities (or modes) are known by the acronym VARK: Visual, Auditory, Reading/Writing, and Kinesthetic. They are sometimes inaccurately referred to as "learning styles," implying that each learner has a "style" of learning that should be emphasized in all contexts. You may have taken a test to determine your learning style or been taught that you are a specific type of learner (Balester, V. 2017).

The use of simulations and digital games in learning and assessment is expected to increase over the next several years. According to McClarty, Kl, (2012), although there is much theoretical support for the benefits of digital games in learning and education, there is mixed empirical support. This research report provides an overview of the theoretical and empirical evidence behind five key claims about the use of digital games in education. The claims are that digital games (1) are built on sound learning principles, (2) provide more engagement for the learner, (3) provide personalized learning opportunities, (4) teach 21st century skills, and (5) provide an environment for authentic and relevant assessment. The evidence for each claim is presented and directions for future research are discussed.

This review is intended as a timely introduction to current thinking about the role of computer games in supporting children's learning inside and out of school. It highlights the key areas of research in the field, in particular the increasing interest in pleasurable learning, learning through doing and learning through collaboration, that games seem to offer. At the same time, the review takes a measured tone in acknowledging some of the obstacles and challenges to using games within our current education system and models of learning, Kirriemuir, J., Mcfarlane, A. (2014).

This article of Kafai, Y. B. (2016), presents an overview of what we know about two perspectives, coined instructionist and constructionist, to games for learning. The instructionists, accustomed to thinking in terms of making instructional educational materials, turn naturally to the concept of designing instructional games. Far fewer people have sought to turn the tables: by making games for learning instead of playing games for learning. Rather than embedding "lessons" directly in games, constructionists have focused their efforts on providing students with greater opportunities to construct their own games—and to construct new relationships with knowledge in the process. Research has only begun to build a body of experience that will make us believe in the value of playing and making games for learning.

Enhance Instructional Quality leads to greater instructional efficiency and improved student learning. More students can be educated more effectively and efficiently if the teaching quality is strong. On the other hand, when academic staff members are better prepared, they experience a greater sense of professionalism and their responsibilities become more intrinsically rewarding, which will enhance institutional commitment (Asian Development Bank, 2019).

The author Douglas, H. (2016), provides an introduction to e-learning and its role in medical education by outlining key terms, the components of e-learning, the evidence for its effectiveness, faculty development needs for implementation, evaluation strategies for e-learning and its technology, and how e-learning might be considered evidence of academic scholarship. E-learning is the use of Internet technologies to enhance knowledge

and performance. E-learning technologies offer learners control over content, learning sequence, pace of learning, time, and often media, allowing them to tailor their experiences to meet their personal learning objectives. In diverse medical education contexts, e-learning appears to be at least as effective as traditional instructor-led methods such as lectures. Students do not see e-learning as replacing traditional instructor-led training but as a complement to it, forming part of a blended-learning strategy. A developing infrastructure to support e-learning within medical education includes repositories, or digital libraries, to manage access to e-learning materials, consensus on technical standardization, and methods for peer review of these resources. E-learning presents numerous research opportunities for faculty, along with continuing challenges for documenting scholarship. Innovations in e-learning technologies point toward a revolution in education, allowing learning to be individualized (adaptive learning), enhancing learners' interactions with others (collaborative learning), and transforming the role of the teacher. The integration of e-learning into medical education can catalyze the shift toward applying adult learning theory, where educators will no longer serve mainly as the distributors of content, but will become more involved as facilitators of learning and assessors of competency.

When evaluating instructional materials consider the extent to which each is interesting, approachable, and engaging. This isn't about materials being "entertaining." It's about whether it can spark curiosity and promote deeper thinking about the content. The more pupils are engaged with the learning resources you provide, the more they will learn. It is beneficial to have a variety of items to increase involvement in; such as images, charts, diagrams, audio, video, or interactive activities. When you providing more than one way of learning a thing, it's more likely learners will find something that will engage them and help them learn (Trustees of Indiana University, 2020).

People who have higher adaptation levels are more flexible and have better adaptability to cope with changing conditions. The career constructions theory suggests that career success is gained for an adaptable individual and the ability to express appropriate behavior in overcoming changing conditions. This is demonstrated by good adjustment, success and satisfaction (Savickas & Porfeli, 2012).

Many colleges and universities world-wide utilize the Internet as a vehicle for E-learning. A course on database management systems (DBMS) is a foundational course that underpins many information systems (IS) degree programs and is pivotal in determining the success of its graduates. Thus, pedagogies that improve the learning for students in a DBMS course are important to not only the faculty and students but to their employers as well. This paper describes the results of a designed experiment to measure the effectiveness of two pedagogical approaches in an e-learning environment. The results are mixed but provide evidence that providing the text's multiple choice questions with answers via the Internet improves performance on the final examination not only on the multiple choice questions but also on the theory questions. These new results need further testing in different environments but provide an initial improvement worthy of consideration for those teaching a DBMS class, Douglas, D. Der Vyver, G. (2016).

Much of existing assessment and instructional design strategies revolve around the use of learning objectives. Learning objectives are used by faculty, by instructional designers, by accreditors, by assessment offices, and by students. But even as the use of learning objectives becomes more widespread, the definition and purpose have remained unclear. Instructional designers argue that learning objectives exist to provide a focused mindset for students engaging in the content, while faculty often view learning objectives as an administrative requirement that has little impact on teaching or student performance, Mitchell & Manzo (2018).

Goldman (2014) emphasizes the pretest and posttest is the quantifying of the knowledge attained in the class from a group of students with diverse learning styles and educational backgrounds. Kelly (2009) also states that many teachers believe that the best and effective lesson plans are those which begins in the final assessment in mind. He emphasizes that the teacher must know what they want to test before creating their actual content. Pretest allows teacher to see is what is being covered in the lesson or the quarter is already mastered.

Isabell et al. (2017) designed a simulation to incorporate affective learning to increase students comfort and confidence with the crucial end-of-life conversations they would have with patients and family members. Fifty-five student participants reported an increased self-confidence in their ability to communicate with dying patients and family members. Further, they recognized the emotional toll caring for dying patients and their families has on them as individuals.

The researcher finds the above literature relevant to the present study which is the use of E-learning material in Science. Science content videos help students to understand the lesson as to compare with the normal class discussion. It also helps them to remember the lesson because of the audio-visual presentation. It is considered as a motivational tool and a cognitive technique which enhances student learning ability.

When evaluating instructional materials consider the extent to which each is interesting, approachable, and engaging. This isn't about materials being "entertaining." It's about whether it can spark curiosity and promote deeper thinking about the content. The more pupils are engaged with the learning resources you provide, the more they will learn. It is beneficial to have a variety of items to increase involvement in; such as images, charts, diagrams, audio, video, or interactive activities. When you providing more than one way of learning a thing, it's more likely learners will find something that will engage them and help them learn (Trustees of Indiana University, 2020).

Abdu-Raheem (2016) defines instructional materials as essential and significant tools needed for teaching and learning of school subjects to help teacher's efficiency and improve students' performance. Apart from verbal and non-verbal communication therefore, instructional materials are equally used by the teacher to communicate and make learning meaningful. Effective teachers engage student attention through active delivery, vocal variety, appropriate employment of instructional materials and frequent gestures and movement.

According to Hattie (2019) stated that it is the teachers who are open to experience, learn from errors, seek and learn from response of students and who foster effort, clarity and interest in learning.

The standard teaching qualification in the Philippines is a four-year bachelor's degree. Elementary school teachers are qualified through a Bachelor of Elementary Education, and secondary school teachers through a Bachelor of Secondary Education. The curriculum for both these programs are adapted to the level of education and is set by CHED and consists of general education subjects, education-related subjects, subject specialization and practical teaching. For those with a bachelor's degree in other field can also qualify in becoming a teacher by finishing a post-graduate program in Education. These post-graduate programs range from one semester to one year in length and are completed by awarding a credential most commonly referred as the Certificate of Professional Education (Wikimedia, 2021).

According to Sax (2017) with gender-based instruction, it has been significant for parents and educators to understand how boys and girls learn and using it for the child's advantage. It means that engaging girls in math, science, and technology, while promoting reading and writing with "boy friendly" literature in the classroom. Gender based classrooms are not intended to have a changed in curriculum for boys and girls. It is not giving preference for one gender over another and it is not for separation.

Richey et al. (2019) defined competency as a knowledge, the ability to do the activities of a certain occupation or function to the standards expected in the workplace. Professional competencies and standards are useful tools for communicating our professionals' value-add to stakeholders outside of our community in a variety of professional contexts, as well as assisting our professionals and emerging professionals in their professional development and lifelong learning planning, and to guide our academic programs to align with the expectations of the needs in our field (Martin, F. & Ritzhaupt, A. D. 2020).

According to Allen, M. (2017) states that the study of instructional quality communication focuses on the communicative elements that influence the teaching–learning process across topic areas, grade levels (e.g., K–12, college, and university), and instructional settings (e.g., the college classroom, the corporate training room). Moreover, instructional quality focus on how student behaviors and accomplishments such as achievement of learning outcomes, course grades, persistence, or choice of. (Brown, J. & Kurzweil, M. 2019).

The different literature cited give concepts that could be seen as a link between students and the course material they have access to. The ability to learn how to learn is the most important skill for lifelong learning, and it can be developed by students through self-directed learning. The actions that students engage in that affect their learning results are referred to as "studying." They make it possible for students to comprehend and assimilate the information from a particular book.

The purpose of the supplemental learning materials is to help students acquire the competencies based on the most crucial learning competencies for physical education that have been prepared by the Department of Education (DepEd). By doing this, students are able to understand questions and accurately respond to them once they have learned the subject, which leads to higher academic progress.

4.2 Related Studies

Anderson, A., Gronlund, A. (2017), This paper presents a critical review of research on challenges for e-learning with a particular focus on developing countries. A comprehensive literature review including 60 papers on e-learning challenges was undertaken for the purpose of understanding how to implement e-learning in developing countries. Research questions were: what has existing research identified as the major challenges for e-learning, and, what differences, if any, are there between developing countries and developed countries in this respect? The literature study found 278 papers which were condensed to 60 based on exclusion and inclusion criteria designed to find papers of best quality as well as papers that clearly investigated well-defined challenges. The research found 30 specific challenges which were grouped into four categories, viz.: courses, individuals, technology and context. The overall conclusion is that these challenges are equally valid for both developed and developing countries; however in developing countries more papers focus on access to technology and context whereas in developed countries more papers concern individuals. A further finding is that most papers focus on one or two categories of challenges; few papers exhibit a comprehensive view. Because challenges are interrelated, based on the findings we propose a conceptual framework of emerging issues for e-learning in developed and developing countries. The framework is useful to guide both practice and research.

Learners Performance is relatively permanent changes in knowledge or behavior that support retention and transfer (Soderstrom et al., 2015). In addition, student performance levels are what makes a rubric more than an assignment checklist. You can help students avoid making frequent mistakes by giving them a variety of response options (Southwestern University, 2018).

Although the conditions for successful technology integration finally appear to be in place, including ready access to technology, increased training for teachers, and a favorable policy environment, high-level technology use is still surprisingly low. This suggests that additional barriers, specifically related to teachers' pedagogical beliefs, may be at work. Previous researchers have noted the influence of teachers' beliefs on classroom instruction specifically in math, reading, and science, yet little research has been done to establish a similar link to teachers' classroom uses of technology. In this article, I argue for the importance of such research and present a conceptual overview of teacher pedagogical beliefs as a vital first step. After defining and describing the nature of teacher beliefs, including how they are likely to impact teachers' classroom practice I describe important implications for teacher professional development and offer suggestions for future research.

Enhance Instructional Quality leads to greater instructional efficiency and improved student learning. More students can be educated more effectively and efficiently if the teaching quality is strong. On the other hand, when academic staff members are better prepared, they experience a greater sense of professionalism and their responsibilities become more intrinsically rewarding, which will enhance institutional commitment (Asian Development Bank, 2019).

Moreover, utilizing the results of the pre- and post-tests in Oral Communication after using task-based approach, this study looked into the level of oral communication skills of the Grade 11 General Academic Strand students of Domalandan Center Integrated School this school year 2018- 2019. The findings revealed that, whereas the overall rating before utilizing task-based strategies was satisfactory, the majority of the students performed exceptionally well after employing task-based activities. Likewise, it also showed that the level of oral communication skills of the Grade 11 GAS students significantly differed before and after using task-based strategy (Tety, J. L. 2018).

The results of the study indicated that students worked best in instructional formats that best suit their learning styles. Teachers are therefore challenged to capitalize on the significance of tasks in students' increased motivation in language acquisition in the classroom. It also urged teachers to devise new approaches to aid in the creation of a more effective learning environment (Tety, J. L. 2018).

The way we define learning and what we believe about the way learning occurs has important implications for situations in which we want to facilitate changes in what people know and/ or do. Learning theories provide instructional designers with verified instructional strategies and techniques for facilitating learning as well as a foundation for intelligent strategy selection. Yet many designers are operating under the constraints of a limited theoretical background. This paper is an attempt to familiarize designers with three

relevant positions on learning (behavioral, cognitive, and constructivist) which provide structured foundations for planning and conducting instructional design activities. Each learning perspective is discussed in terms of its specific interpretation of the learning process and the resulting implications for instructional designers and educational practitioners. The information presented here provides the reader with a comparison of these three different viewpoints and illustrates how these differences might be translated into practical applications in instructional situations.

According to Kuehn (2017), the pre-test and post-test can be a valuable diagnostic tool for more effective teaching. It should be design to measure the amount of learning a student has acquired in a specific subject. To do this, questions concerning all of the topics covered during the third quarter must appear on the test. To demonstrate and evaluate the student progress has been made during the given quarter, the post-test score should be higher than the pre-test score.

The studies on creating learning environments based on differences in learning styles have gained importance in recent years. Learning styles are one of the most important parameters in determining individual differences. Accordingly, traditional web-based learning environments have been replaced by individualized adaptive e-learning environments on the basis of learning styles which are more innovative. This study deals with the content analysis of the recent studies on Adaptive Educational Hypermedia (AEH) based on learning styles. 69 articles published from 2005 to 2014 were obtained through a comprehensive and detailed review. Afterwards, these studies were subjected to document analysis. The studies were categorized under the titles of purpose, nature, method, characteristics of examinees, level, data collection tool, learner modelling, learning styles, subject, and findings. Some of the studies offered a framework or proposed a model for AEH while others focused on the influence of AEH on academic achievement and learning outputs as well as learning satisfaction. This study examines the existing tendencies and gaps in the literature and discusses the potential research topics, Ozyurt, O., Ozyurt, H., (2015).

Digital game-based learning is a popular strategy for engaging students by making learning fun. Actively involving students as designers and producers of digital games may have even greater potential for student empowerment through enhancing concentration and engagement, fostering higher order thinking, and improving learning outcomes. Thus, this study empirically investigated the impact of digital game authoring on students' concentration, critical thinking skills, and academic achievement. A total of 67 students in two seventh-grade classes participated in this 19-week-long experiment, and were divided into an experimental group (32 students designing digital games) and a comparison group (35 students designing Flash animations). The interdisciplinary approach involved integrating biology and computer programming classes. Students in the experimental group designed digital games based upon biology course content, while the comparison group collaboratively produced Flash animations based upon the same course content. The experimental results, using MANCOVA for pretest, posttest, and delayed posttest scores, demonstrate significant improvements in critical thinking skills, and academic achievement, with increased retention of both course content and critical thinking skills observed for the delayed posttest. For concentration, a relative advantage for the experimental group as compared with the comparison group was noted, but did not reach statistical significance. Based on the results of this study, implications for practitioners and researchers are provided, including the integration of programming or computer science with other courses for digital game authoring and the evaluation of other learning outcomes such as creative thinking, problem-solving, and flow.

Computer-assisted learning is known to be an effective tool for improving learning in both adults and children. Recent years have seen the emergence of the so-called 'serious games (SGs)' that are flooding the educational games market. In this paper by Girard, C., Ecalle, J., Magnan, A. (2012), the term 'serious games' is used to refer to video games (VGs) intended to serve a useful purpose. The objective was to review the results of experimental studies designed to examine the effectiveness of VGs and SGs on players' learning and engagement. After pointing out the varied nature of the obtained results and the impossibility of reaching any reliable conclusion concerning the effectiveness of VGs and SGs in learning, we stress the limitations of the existing literature and make a number of suggestions for future studies.

Although most agree that games can be engaging and that games can be instructive, there is little consensus regarding the essential characteristics of instructional games. Implicit in the research literature is the notion that if we pair instructional content with certain game features, we can harness the power of games to

engage users and achieve desired instructional goals. In this article, Garris, M., Ahlers, R., Driskel, J., (2017), the authors present an input-process-output model of instructional games and learning that elaborates (a) the key features of games that are of interest from an instructional perspective; (b) the game cycle of user judgments, behavior, and feedback that is a hallmark of engagement in game play; and (c) the types of learning outcomes that can be achieved. The authors discuss the implications of this approach for the design and implementation of effective instructional games.

The concept of intrinsic motivation lies at the heart of the user engagement created by digital games. Yet despite this, educational software has traditionally attempted to harness games as extrinsic motivation by using them as a sugar coating for learning content. Habgood, J., Ainsworth, S. (2011), This article tests the concept of intrinsic integration as a way of creating a more productive relationship between educational games and their learning content. Two studies assessed this approach by designing and evaluating an educational game called Zombie Division to teach mathematics to 7- to 11-year-olds. The results showed that children learned more from the intrinsic version of the game under fixed time limits and spent 7 times longer playing it in free-time situations. Together, these studies offer evidence for the genuine value of an intrinsic approach for creating effective educational games. The theoretical and commercial implications of these findings are discussed.

In the study of Lavilles Jr, H. L., & Robles, A. C. M. O. (2017) stated that on 21st century education requires wide-ranging knowledge and skills of teachers critically important to school's success. The value of soft skills becomes a trend. However, there has not been any study conducted on the soft skills proficiency level of the teachers and school performance in Sultan Kudarat. For this reason, the goal of the study was to determine the level of soft skills competency among teachers and the school performance of chosen schools in the Sultan Kudarat Division. It also included conversations about the link between teachers' soft skill proficiency and school performance. Moreover, a correlational analysis was done to determine a significant relationship between teachers' soft skills proficiency level and their school performance.

Moreover, findings revealed that there is significant relationship between teachers' soft skills proficiency level and school performance. This indicates that high-level of soft skills proficiency tend to improve the school performance. In conclusion, this study has shown that soft skills proficiency is one of the qualities that a teacher should have. The teachers' high soft skills competence level meant that they were effective in carrying out their responsibilities and functions in order to improve school performance. The Division of Sultan Kudarat is recommended to share the programs of the schools with teachers who have high soft skills proficiency level. In this, other teachers can improve their soft skills proficiency level and contribute to improving the school performance.

In the study of Galiza, J. D. R. et.al (2018) stated that based on the findings gathered, the teacher-respondents were mostly enrolled in graduate school and have earned units for their Master's degree. Based on the interview, most of the teachers who were over 40 years old and above had no interest in pursuing their career to the next level. They could no longer see the benefit they could derive from it. One of them even stated that she had reached the peak of her teaching career.

Class size is one factor to consider when evaluating a school's effectiveness. Education researchers have found that class size reduction in the early grade helps students achieve because there is a greater opportunity for individual interaction between student and teacher in a small class. Based on a large number of studies, smaller classes have witnessed positive and sometimes enduring effects on student achievement, especially for ethnic minority students and students from socioeconomic status groups. Unfortunately, limited resources resulted in a worsening shortage of teachers and classrooms. At the start of the 2018 school year, more than 70% of Metro Manila schools were still operating on double shifts to accommodate the growing student population. The Department of Education has dealt with these shortfalls by authorizing exceptionally large class sizes in order to accommodate a growing school-age population (Sison, M. A. 2020).

Further, Sison also stated that oversized public-school classes not only deny Filipino school children quality education but also deny teachers just compensation and humane working conditions. In the current system, a teacher handling a class of 70 students is in fact taking on the workload of two teachers, without receiving any additional compensation. This practice of assigning oversized classes to teachers without extra pay is one instance where they are "overworked yet unpaid".

In the study of Cortes, A. P. (2016) states that there was a quasi-experimental method of research which employed the pretest-posttest-control group design. This was aimed to determine the communication strategies used by Grade 11 students and correlated them with their performance in oral communication. Based on the findings of the study, conclusion was made states that if more communication strategies are used by students this could translate to higher performance in oral communication; and the use of target communication strategies was a more effective vehicle in developing the optimum potentials of the students' oral communication skills.

In addition in the study of Cortes, A. P. (2016), states the three major recommendations of the study affirmed that the proposed intervention be used by Grade 11 teachers to improve the oral communication skills of the students. On the other hand, that the students continue learning and using communication strategies for them to be more proficient with the English language; and lastly that DepEd integrate the use of communication strategies in the curriculum to help address learners' communication breakdowns.

According to De Vera, P. V. & De Vera J. S. (2018) asserts that they used employed descriptive and inferential methods to determine, characterize and analyze the oral communication skills in English of Grade 11 HUMSS (Humanities and Social Sciences) students. The students' level of performance along the said skills is measured using a mobile application. As to their performance in the speaking skills test as the other component-indicator of oral communication skills, the majority of them registered within the bracket of "good" performance level.

In the study of Cárdenas, R. & Chaves, O. (2016) affirms that self-ratings, although inconsistent at times, also showed their awareness in terms of low proficiency levels and less confidence in their proficiency level. The survey also discovered that differences in teacher proficiency exist not only between public and private schools, but even within private schools. Besides, sound programs for those in charge of teacher development should be available and opportunities have to be provided for exchange programs, with a significant duration as to produce effective changes in teachers' proficiency.

The different studies mentioned shows that although motivating students has always been difficult, doing it now is more difficult due to the competition for students' attention brought on by the communications revolution of the past 30 years. Some teaching strategies have a better chance than others of engaging students and involving them in worthwhile learning activities.

Adaptable materials are simple to use with readers or authors with a range of skill levels, they can promote individualization. The use of proper sequencing is beneficial across the curriculum and is appropriate for any grade. When reading, students use sequencing to determine how a tale progresses from the introduction to the resolution. As a result, careful thought has gone into this sequencing. On the other hand, multimodal learning theories are used to examine how strategy instructions affect learning from text and images. Learning exercises are crucial in educational environments.

5. RESEARCH METHODOLOGY

This chapter deals with the method and procedures which were in the certain study. It consists of the research design, respondents of the study, procedure, data gathering procedure, research instrument and statistical treatment of data.

3.1 Research Design

The study used descriptive type of research in determining the effectiveness of the e – Learning material which will be measured through the pre – test and post – test. According to Sevilla et.al (2010) descriptive method is used to describe the nature of the situations as exists at the time of the study and to explore the causes of the particular problem. On the other hand, Calderon (2010) cited that descriptive method focuses at the present condition.

The pre-test and post-test design according to Kowalczyk (2015) is usually a quasi-experimental where participants studied before and after experimental manipulation. Quasi-experimental simply means participants are randomly assigned.

This type of research design was used to determine how valid does the e – learning material in earth and life science for struggling learners would be.

3.2 Research Location

The location and resources are accessible in a place that was comfortable for the researcher during the implementation period. The respondents the study are currently studying at Lumban Senior High School, Brgy. Wawa Lumban, Laguna. It is less than a 45-minute drive from the Laguna State Polytechnique University-Main Campus Sta. Cruz, Laguna.

3.3 The subject of the Study

The study is about the effectiveness and acceptability of the e – learning material in earth and life science for struggling learners, the population will be consisting of student who got a final grade of 79 and below in Lumban Senior High School.

Table 1 present the list of sections and the number of respondents who will validate the E – Learning material for Earth and Life Science.

Table 1. List of Sections and Number of Respondents

GRADE LEVEL	Control Group	Experimental Group	Total
Grade 11 Students	Benjamin Agarao Sr. (12 students)	Teodoro Ebarvia Sr. (15 students)	50 students
	Tomas Anonuevo (13 students)	Nela Yu-Ferrer (10 students)	

The purposive sampling was employed when samples were selected based on the particular purpose of the experiment.

Purposive sampling was used in the selection of evaluator since the research was only after the evaluation of the e-Learning Material.

3.4 Research Procedure

In gathering data relevant to this study, the researcher employed the following: (1) Gathered lesson on the 2nd quarter of Earth and Life Science that has a low MPS result, (2) Identify the topics wherein e-learning application can be applied, (3) Develop the E-Learning Material, (4) Evaluation Checklist of the E-learning Material, (5) Pretest and Posttest for the E-learning material. The researcher gave the respondents a pretest followed by the E-learning material and the posttest. Letters addressed to the Principal of Lumban Senior High School in Laguna were prepared, requesting permission to distribute the set of questionnaires to the eleventh graders as actual respondents of this study. As the said school authorities approved, the distribution and retrieval of the sets mentioned earlier of major instruments were done personally by the researcher to clarify questions that are finding highly technical in nature by the actual respondents.

3.5 Research Instrument

Questionnaire was the main instrument used in this research to gather data from the respondents who simply marked or filled up the blank spaces corresponding to their purpose. Part I of the questionnaire consist of the personal profile Part II is the e-learning material consist of objectives, content and activities related to the lesson. Part III is the evaluation of e-learning material consist of usability, efficiency, and validity. The rating scale used are as followed:

5 – Extremely Acceptable (EA)
4 – Very Acceptable (VA)
3 – Moderately Acceptable (MA)
2 – Slightly Acceptable (SA)
1 – Not Acceptable (NA)

3.7 Statistical Treatment of Data

As soon as the pertinent data was gathered by the researcher, these were compiled, sorted out, organized and tabulated. Data were subjected to statistical treatment in order to answer the questions proposed in the study.

1. Weighted average mean and Standard Deviation were used to determine the status of the e-learning material in terms of pre–test and post–test which is equivalent to the quality of the E – Learning Material.

2. Weighted average mean and Standard Deviation were used to determine the status of e-learning material in terms of the efficiency, usability, and adaptability which is equivalent to the effectiveness of the material.

3. T - test will be used to determine the significant relationship between the effectiveness and acceptability of the e – learning material.

6. Presentation, Interpretation, and Analysis of Data

This chapter presents the data gathered on the assessment of the developed E – Learning Material in Earth and Life Science. In this study, the intervention material was rated by science teachers and students in terms of its objectives, content, exercises, efficiency, usability and adaptability.

In table 2, Respondents' Rating in the Acceptability of the E- learning Materials in terms of Objectives, the respondents assessed the E- learning materials in terms of objectives as highly acceptable. The objectives of E- learning materials see relevant to the topic has (M=4.73, SD=0.47) and it provides behavioral terms has (M=4.62, SD=0.70). The objectives are also specific and clearly stated (M=4.41, SD=0.73), possible to attain (M=4.42, SD=0.70) and able to be measurable (M= 4.39, SD=0.69). The overall mean (M=4.50, SD=0.50) for the level of acceptability of E- learning Materials in Earth and Life Science indicates how data scores are homogeneous to each other.

Mitchell & Manzo (2018), stated that much of existing assessment and instructional design strategies revolve around the use of learning objectives. Learning objectives are used by faculty, by instructional designers, by accreditors, by assessment offices, and by students. Instructional designers agree that learning objectives exist to provide a focused mindset for students engaging in the content, while faculty often view learning objectives as an administrative requirement that has little impact on teaching or student performance.

Table 2. Respondents' Rating in the Acceptability of the E- learning Materials in terms of Objectives.

Indicators The objectives are….	Mean	SD	Verbal Interpretation
relevant to the topics covered in Earth and Life Science.	4.73	0.47	Highly Acceptable
stated the behavioral terms.	4.62	0.70	Highly Acceptable
specific and clearly stated	4.41	0.73	Highly Acceptable
Possible to achieve.	4.42	0.70	Highly Acceptable

Able to be measured.	4.39	0.69	Highly Acceptable
Overall Mean	4.50	0.50	**Highly Acceptable**

This implies that the objectives of the E- learning modules for struggling learners are accurate, which drives them to learn despite the COVID pandemic issue and the absence of the face-to-face to the students.

Table 3. Respondents' Rating in the Acceptability of the E- learning Materials in terms of Content.

Indicators	Mean	SD	Verbal Interpretation
The E- learning reflects the most important aspect of what is being taught.	4.46	0.64	Highly Acceptable
The content leads to the attainment of the objectives.	4.55	0.72	Highly Acceptable
There is adequate presentation of the objectives.	4.24	0.73	Highly Acceptable
The direction in the exercise is concise, readable, and easy to fallow.	4.38	0.66	Highly Acceptable
The concept for each activity is arranged logically to ensure duplication	4.11	0.83	Very Acceptable
Overall Mean	4.35	0.48	**Highly Acceptable**

In table 3, The respondents assessed the content of the E- learning materials as highly acceptable. It was seen that E- learning materials in Earth and Life science reflect the most important aspect of what is being taught with (M= 4.46, SD= 0.64) The content leads to the attainment of the objectives (M= 4.55, SD= 0.72) The direction in the exercise is concise, readable, and easy to fallow (M= 4.38, SD= 0.66). Although it was observed by the respondents that the concept of each activity is arranged logically to ensure duplication is very acceptable and it is the item with the lowest rating in terms of the content. The overall mean (M= 4.35, SD= 0.48) for the level of content of E- learning materials indicates how data scores are homogeneous to each other.

According to International Journal of Academic Research in Business and Social Sciences (2012), E-learning is the use of Internet technologies to enhance knowledge and performance. E-learning technologies offer learners control over content, learning sequence, pace of learning, time, and often media, allowing them to tailor their experiences to meet their personal learning objectives. to manage access to e-learning materials, consensus on technical standardization, and methods for peer review of these resources.

Table 4. Respondents' Rating in the Acceptability of the E- learning Materials in terms of Exercises.

Indicators	Mean	SD	Verbal Interpretation
Relevant to the Objectives.	4.47	0.63	Highly Acceptable
Adequate to develop student's science knowledge and skills.	4.51	0.66	Highly Acceptable
Appropriate to student's abilities.	4.43	0.64	Highly Acceptable
Sufficient mastery level of the students.	4.24	0.62	Highly Acceptable
Fitted on the items that measure the thinking	4.39	0.64	Highly Acceptable
Overall Mean	4.41	0.40	**Highly Acceptable**

In table 4, the respondents assessed the E- learning materials in terms of exercises as highly acceptable. The exercises of E- learning materials see relevant to the objectives has (M=4.47, SD=0.63) and it develop student's science knowledge and skills has (M=4.51, SD=0.66). The exercises appropriate to student's abilities, sufficient mastery level of the students, fitted on the items that measure the thinking with the (M= 4.43, 4.24 and 4.39) respectively. The overall mean (M=4.41, SD=0.40) for the level of acceptability of E- learning Materials in Earth and Life Science indicates how data scores are homogeneous to each other.

It can be said that in learning process, students engage in activities through which they enhance skills and acquire concepts. From this statement it is know that in learning process, learners construct and build on their prior knowledge through activities chosen to simulate those that will be encountered in real life. (Cooperstein & Weidinger; 2004).

Table 5. Respondents' Rating in the Acceptability of the E- learning Materials in terms of Efficiency.

Indicators	Mean	SD	Verbal Interpretation
Step by steps procedure help the learners to have knowledge of the topic.	4.42	0.64	Highly Acceptable
It engages the learner to different topics.	4.58	0.64	Highly Acceptable
It encourages learners to do activities in the subject matter.	4.30	0.76	Highly Acceptable
It optimized the communication between learners.	4.28	0.71	Highly Acceptable
It provides learners the focus on their own.	4.38	0.72	Highly Acceptable
Overall Mean	4.39	0.46	**Highly Acceptable**

In table 5, the respondents assessed the E- learning materials in terms of efficiency as Highly Acceptable. The efficiency of E- learning materials step by step procedure help learners to have knowledge of the topic has (M=4.42, SD=0.64). The efficacy also result to learners engages, encourages and provides learners focus with the (M= 4.58, 4.30 and 4.28) respectively. The overall mean (M=4.39, SD=0.46) for the level of acceptability of E- learning Materials in Earth and Life Science indicates how data scores are homogeneous to each other.

Enhance Instructional Quality leads to greater instructional efficiency and improved student learning. More students can be educated more effectively and efficiently if the teaching quality is strong. On the other hand, when academic staff members are better prepared, they experience a greater sense of professionalism and their responsibilities become more intrinsically rewarding, which will enhance institutional commitment (Asian Development Bank, 2019).

In table 6, the overall mean of 4.34 and SD of 0.47 which give a verbal interpretation of highly acceptable in terms of the e-learning usability. It is supported by the fact that it provides learning task which are design to sharpen the target learner's scientific skills (M=4.43, SD=0.65). E-learning material also contain lesson that are relevant to the target learners' personal experiences, offers various activities and illustrate real -life experiences that can be a basis for comprehension (M=4.44, M=4.31, M=4.34). The e-learning material in terms of usability can also be a supplement for books and manuals for learners who find the topic difficult (M=4.35 SD=0.74).

Apparently, Kattoua T. (2016), Universities all over the world are investing substantially in e-learning technologies to assist their traditional teaching and to enhance the learning and performance of their students due to the quick development of internet technology. The study of several antecedent elements that affect students' adoption and usage of such e-learning systems is necessary for an e-learning system to be successful. This study attempts to provide a discussion of the present e-learning environments, covering those environments' traits, drawbacks, and benefits, as well as the key elements that influence how well-liked such technologies are. The

study's findings support the idea that an effective e-learning system should take into account environmental, organizational, social, and technological aspects.

Table 6. Respondents' Rating in the Acceptability of the E- learning Materials in terms of Usability.

Indicators	Mean	SD	Verbal Interpretation
Provide learning task which are design to sharpen the target learners' scientific skill.	4.43	0.65	Highly Acceptable
Contain lesson that are relevant to the target learners' personal experiences.	4.44	0.69	Highly Acceptable
Offers various activity.	4.31	0.77	Highly Acceptable
Illustrate real -life experiences that can be a basis for comprehension.	4.24	0.72	Highly Acceptable
Can be a supplement for books and manuals for learners who find the topic difficult.	4.35	0.74	Highly Acceptable
Overall Mean	4.34	0.47	**Highly Acceptable**

In table 7, Respondent's rating in the Acceptability of the E-Learning Material in terms of Adaptability. The overall mean of 4.34 and SD ofR 0.47 which give a verbal interpretation of highly acceptable in terms of the e-learning's adaptability. It is supported by the fact that it is versatile that can be used across curriculum (M=4.33, SD=0.75). E-learning material also provide activities which are aligned to various learning style of the students, contains varied challenging task that can be done by the target learners and encourage students to become effectively involved in the learning activities (M=4.46, M=4.31, M=4.34). The e-learning material in terms of usability can also be a supplement for books and manuals for learners who find the topic difficult (M=4.35 SD=0.74). Although it was observed by the respondents that it can be revised in order to fit the purposes or objectives is very acceptable, the items with the lowest rating score were on, the adaptability.

Table 7. Respondents' Rating in the Acceptability of the E- learning Material in terms of Adaptability

Indicators	Mean	SD	Verbal Interpretation
Versatile that can be used across curriculum.	4.33	0.75	Highly Acceptable
Provide activities which are aligned to various learning style of the students.	4.46	0.69	Highly Acceptable
Contains varied challenging task that can be done by target learners.	4.31	0.73	Highly Acceptable
Can be revised in order to fit the purposes or objectives.	4.15	0.72	Very Acceptable
Encourage the students to become effectively involved in the learning activities.	4.34	0.77	Highly Acceptable
Overall Mean	4.32	0.51	**Highly Acceptable**

People who have higher adaptation levels are more flexible and have better adaptability to cope with changing conditions. The career constructions theory suggests that career success is gained for an adaptable

individual and the ability to express appropriate behavior in overcoming changing conditions. This is demonstrated by good adjustment, success and satisfaction (Savickas & Porfeli, 2012).

Table 8. Performance in Pretest and Posttest of the Control Group and Experimental Group.

Group Test	Mean	SD	Remark
Control • Pretest • Posttest	16.20 19.40	3.29 3.34	Average Good
Experimental • Pretest • Posttest	16.76 23.36	3.22 2.90	Average Good

The table 8 shows the performance means score of the control and experimental groups in terms of their scores in pretest and posttest.

It can be gleaned from table 8 the pretest means scores of the two groups. The control group has mean (M=16.20 SD=3.29) has average mastery in the topics while the experimental group has a mean score (M= 16.76, SD= 3.22) indicating also the Average Mastery. On the other hand, the result of the posttest scores of the two groups of respondents was also indicated. The (M= 19.40, SD= 3.34) in the control group and the (M= 23.36, SD=2.90) in the experimental group Showing good mastery of the lesson of the respondents in control and experimental group groups. This imply that the performance of the respondents improves in the pretest and post test scores through the help of the e-learning material.

Goldman (2014) emphasizes the pretest and posttest is the quantifying of the knowledge attained in the class from a group of students with diverse learning styles and educational backgrounds. Kelly (2009) also states that many teachers believe that the best and effective lesson plans are those which begins in the final assessment in mind. He emphasizes that the teacher must know what they want to test before creating their actual content. Pretest allows teacher to see is what is being covered in the lesson or the quarter is already mastered.

Table 9. Difference on the Pretest and Posttest Mean Scores of the Control Group and the Experimental Group.

Group/Test	Pretest	Posttest	Mean difference	Computed t- value	P value	Analysis
Control	16.20	19.40	3.2	-16.76	0.000	Significant
Experimental	16.76	23.36	6.6	-13.57	0.000	Significant

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In Table 9, Difference on the Pretest and Posttest Mean Score of the Control Group and Experimental Group. The result obtained a computed t- value of -16.76 on the control group with a mean difference on the pretest and posttest of 3.2 and a p-value of 0.000. On the other hand, the experimental group with a mean difference of 6.6 and has a computed t- value of -13.57 on the pretest and posttest with a p-value of 0.000 is also significant. Therefore, the null hypothesis is accepted.

As a whole, the experimental group who utilizes the E- learning materials and the control group who did not use the E- learning material shows significant difference in their achievement in terms of pretest and posttest. Furthermore, the data on the posttest of experimental group revealed that the E- learning Material is an effective instructional tool in enhancing students' performance as on the result of their assessment.

According to Kuehn (2017), the pre-test and post-test can be a valuable diagnostic tool for more effective teaching. It should be design to measure the amount of learning a student has acquired in a specific subject. To do this, questions concerning all of the topics covered during the third quarter must appear on the test. To demonstrate and evaluate the student progress has been made during the given quarter, the post-test score should be higher than the pre-test score.

7. Summary, Conclusions, And Recommendations

This chapter is about the summary of the research on E-learning material in Earth and Life Science for Struggling Learners, the significant findings based on the gathered data, the implications of those findings, conclusions as well as the recommendations.

5.1 Summary

The purpose of the project was to produce and validate an E-Learning material for Grade 11 struggling students. Additionally, it focuses on figuring out how the extra material will enhance learners' conceptual comprehension and their perception of the e-learning material's usefulness.

The quasi-experimental approach of research was employed in this study. The goal of the current study is to create and implement e-learning educational materials for Grade 11 struggling students. So, a sort of experiment was conducted. Students in Grade 11 at Lumban Senior High School served as the study's respondents.

The area of investigation was limited to four (4) areas of investigation: 1) Determine the level of quality of the respondents on the use of the E – Learning Material in Earth and Life Science for Struggling Learners in terms of its objective, content and exercises, 2) Determine the level of acceptability of the respondents on the use of the E – Learning Material in Earth and Life Science for Struggling Learners in terms of its efficiency, usability and adaptability, 3) Know the mean score performance of the control and experimental group on the second quarter topic: matter in the use of E – Learning Material in Earth and Life Science in terms of Pre – Test and Post – Test, and 4) Determine if there is a significant difference between the pre-test performance and posttest performance of the control group and experimental group.

The level of quality of the e-learning material as rated by Science teachers and students in terms of its objectives, content, and exercises was highly acceptable.

The level of acceptability of the e-learning material as rated by Science teachers and students in terms of efficiency, usability, and adaptability of the material was highly acceptable.

The Mean Score Performance in pretest of the control group and experimental group were both described as having average performance. The Mean Score Performance in posttest of control group and experimental group were described as good.

There is a significant difference between the pretest and posttest performance of the control group and experimental group as revealed by the probability value of 0.000 which are both less than 0.01 level.

The pretest performance of control and experimental group shows no significant difference as revealed by the p value of 0.47 which is greater than 0.05 level, however, there is a significant difference between the posttest of control and experimental group as revealed the p value of 0.000 which is less than 0.01 level.

5.2 Conclusion

Based from the findings of the study the author of this research concludes that there is a significant difference between the posttest mean score of the control and experimental group, hence, the null hypothesis stating that there is no significant difference is hereby rejected.

5.3 Recommendation

The aforementioned findings and conclusions provided the author of this research a firm basis for the following recommendations.

1. Incorporate the use of E-Learning material in teaching Earth and Life Science especially for learners who struggles in learning during the time of pandemic.

2. Conduct a parallel study by improving the questionnaire of using the E-learning material.

3. Utilize a diverse investigate worldview. Think about the conceivable control impact of scholarly aptitudes and back of the family on the impact of utilizing e-learning material.

4. Conduct a study by improving the services provided by the application through an offline version.

5. Change the research paradigm. Investigate the potential modifying impact of learners' academic abilities and parental support on the impact of employing science-related films as a motivating and cognitive teaching strategy during a certain grading period.

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