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Learning Competencies and Academic Performance in Science Among Grade 9 Learners in Misamis Oriental General Comprehensive High School

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ABSTRACT

This research aimed to investigate the relationship between the level of learned competencies in the Most Essential Learning Competencies (MELCs) and the grade 9 students' performance in the field of Science at Misamis Oriental General Comprehensive High School. It evaluated students' competence mastery in Biology and Chemistry, compared their performance across 2 semesterly grading rounds, and examined whether there was any significant correlation between them. The research design adopted was a descriptive-correlational research design with a quantitative approach as a study that involved 946 Grade 9 students. The competency levels of learners were assessed through DepEd MELC-based 10-item posttests, whereas academic performance was graded based on the scores of their grading period. Descriptive statistics and Pearson product-moment correlation were used to generate the data analysis. Findings indicated that the performance of learned competencies and academic performance had a very strong and statistically significant positive correlation ($r=0.989 r=0.989$, $p<0.05 p<0.05$). It means that the mastery of competency is positively linked to improved academic achievements in the field of science. The conclusion of the study is that better mastery of MELCs by the students would greatly result in the improvement of their academic results in the field of science. As it is suggested, the quality of Self-Learning Modules should be reinforced, and the instructional support should be intensified to maximize learning gains.

INTRODUCTION

The Covid-19 Pandemic has influenced the Philippine educational system, as it has impacted other nations across the globe. The United Nations International Children's Emergency Fund (UNICEF) advises that the Philippines is one of five countries in the world that opted to continue with their studies at home, affecting about 27 million Filipino students. Before the coronavirus hit the country, the Philippine school system had already been financially and technologically challenged. How can a student get through these new pandemic struggles with the existing challenges and unexpected pandemic circumstances? In these changing times, our students have evolved into 21st-century learners, and with pandemics threatening around every corner, our students' needs have changed significantly. The Department of Education needs to embrace change to be able to serve its stakeholders better. The Department of Education has formulated Basic Education Learning Continuity Plan (BE-LCP) in the light of the public health catastrophe of Covid-19. By adopting BE-LCP, the face-to-face lessons will be introduced later when a safe environment is established and mixed distance learning modalities will be provided to eliminate the problem of the inability to be at school. While LCP is offered to every child's right to study, Deped Undersecretary Annalyn Sevilla emphasizes that parental involvement and support are critical to the complete new normal education system.

In the above situation, the move taken by the Philippine educational system, the Department of Education, is the publication of the Most Essential Learning Competency (MELC) to be applied in the country. The implementation of MELC in the entire schools of the country does not curtail the standards of Kto12 educational program, but on the contrary, it serves as the guideline to all teachers and schools and as a reaction to the appeals of SDG 4 to create a resilient educational system.

The Department of Education, Basic Education Curriculum Development, Inclusiveness of Enhanced Basic Education, of DepEd Order no. 43 s.2013, Section 8, should implement quick and efficient and able to respond program education to keep on achieving the enhanced and responsive basic education curriculum in difficult situations. Besides this, Basic Education Curriculum Development, Standards, and Principles state that the curriculum must be learner-centered, inclusive and developmentally right in section 10.

According to Jean Piaget's four stages of development, children's cognitive skills grow as they explore and engage with their surroundings. It claims that they develop cognitively on their own, without the assistance of the adults around them. Learning in these times of pandemic, implementing the suggested Self-Learning Modules (SLM) founded on the most important learning competencies (MELC), is possible and reachable, even during the pandemic.

The application of Piaget's theory to the modules positively influences both teachers and students. Teachers will better understand their learners and develop strategies based on their interests and cognitive abilities. This theory

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is in line with the layout of the self-learning module that incorporates motivational set, modeling, and assignments. The teachers are provided with computer training and seminars to learn the new way of doing things under the new normal education and reminded what is expected of them, which would be to deliver the qualities considered important in the development of children.

According to DepEd Order No.42, s.2017, "National Adoption and Implementation of the Philippine Professional Standards for Teachers (PPST)," a teacher should be able to create learning environments responsive to a variety of learners. The teacher should be aware of and appreciate the variations in the personalities and experiences of the students. Teachers should consistently develop and facilitate every learner according to the mission of our Department of Education. As stated in the 1987 Philippine Constitution, because teachers are guardians of education, it is their duty to protect and nurture the rights of all citizens. The study employed the Most Essential Learning Competency that is outlined in the Self-Learning Modules in establishing the correlation between acquired competencies and the academic performance of the students.

Statement of the Problem

Educational modular distance learning that incorporates the implementation of the Most Essential Learning Competencies (MELCs) is a drastic change in the Philippine educational system in the light of the COVID-19 pandemic. Although the Department of Education (DepEd) has simplified the curriculum to have a continuity of learning, minimal empirical studies have been conducted to evaluate the relationship of how the mastery of the mentioned competencies and the performance of students in Science, especially in the secondary level. Most of the literature has extensively discussed modular learning in general terms; however, little has specifically gauged competency achievements when judged by using MELC-based tests and compared it to the real academic grades in the normal new environment. The paper shall fill this gap by examining the connection between academic performance and learned competencies among Grade 9 learners in a public high school environment context of the Science subject.

Research Objectives

General Objective

To determine the relationship between learned competencies in the Most Essential Learning Competencies (MELCs) and the academic performance of Grade 9 students in Science at Misamis Oriental General Comprehensive High School during the School Year 2021–2022.

Specific Objectives:

1. To determine the level of learned competencies of Grade 9 students in Science during the First and Second Grading periods.
2. To assess the level of academic performance of Grade 9 students in Science for the two grading periods.
3. To examine the relationship between learned competencies and academic performance in Science.
4. To propose recommendations for enhancing Self-Learning Module quality and instructional support based on the study's findings.

Research Questions

1. What is the level of learned competencies of Grade 9 students in Science for the First and Second Grading periods?
2. What is the level of academic performance of Grade 9 students in Science for the two grading periods?
3. Is there a significant relationship between learned competencies and academic performance in Science?
4. What recommendations may be drawn from the study's findings to improve learning outcomes in modular distance education?

Hypotheses

The following hypotheses were tested at the 0.05 level of significance:

- **H_0 (Null Hypothesis):** There is no significant relationship between learned competencies and academic performance in Science among Grade 9 students.
- **H_a (Alternative Hypothesis):** There is a significant relationship between learned competencies and academic performance in Science among Grade 9 students.

LITERATURE REVIEW

COVID-19 has caused havoc to the world since its appearance in late December 2019, and education, like any other vital sector, did not spare the blow. There has been plenty of impact on the students, schools, colleges and universities. The United Nations Educational, Scientific and Cultural Organization (UNESCO) revealed that more than 800 million students worldwide have been impacted; 1 in 5 students have no access to school; 1 in 4 students no access to higher education classes; and 102 countries have ordered nationwide school closures, 11 implementing localized schools closures. Millions of children are out of school daily due to calamities and other persistent humanitarian crises. The onset of COVID-19 has intensified the situation of students across the nations affected or affected by conflict or calamity. Though the Global Campaign for Education (GCE), acknowledges that the decision by the public health to shut the schools, it holds the view that in case of emergency, provision should be laid out so that children can receive education. GCE thinks that every student has a right to learn no matter the place where he or she lives and at what condition he is. During an emergency, education is an essential right of children, youth, and adults and should be among the priority factors in the first place, regardless of the emergency mission (Philani, 2020).

Like the rest of the world, Lebanon has been affected by the Covid19 pandemic. Different confinements and

remote education have caused havoc on the seamless running of courses since the beginning of the health crisis two years ago. The consequences of Covid on the students who automatically had access to higher levels by ministerial decree without prior levels being assessed. As the school year commenced, they had to set up remedial classes since the overall standard had gone down because of the confinements. Other students are unable to read the instructions anymore, have problems speaking and reading, and have serious attention problems. A Ministry of education insider reports that 50 state schools and approximately 30 private schools have already shut their doors as they lacked enough funds since the commencement of the School Year in 2021. In 2021, 14 out of the 86 teachers of Sacré-Coeur stopped working. It is very hard on the teachers. There are other countries that many seek employment (Alphabetical Order of Lebanon, 2022).

The longer the children are out of school, the more it costs the children, as indicated by UNICEF. The lesser the probability of their coming back. At least 2.7 million children in the region will be missing when schools are reopened. This is not to mention the 35 million individuals in East Asia and the Pacific who have already dropped out of school. Children are likely to be assaulted, abused, and exploited in the absence of school. Girls are also at risk of teen pregnancy and early marriage. The statistics of students failing to meet the minimum reading standards increased by 20% during the school closures, as per the World Bank. In 2019, there was a higher number of online platforms, television, or radio with which children could access remote learning in Timor-Leste compared to 2018. As a matter of fact, Timor-Leste is a small nation that has few ways of learning meaningful lessons. And Thai children in low-income families who are prone to falling do are given cash transfers to retain them at school. Vietnam changed its curriculum to decrease the academic pressure and stress students. Teachers are compelling us to redesign education, adopt innovations in the grassroots, and community-based technologies (Maslog, 2021).

According to an Asian Development Bank report, school closures have impacted about 250 million K-12 children and 10 million instructors in India, which has the world's largest educational system. It cites research that shows pupils in the South Asian country are no longer learning at "class-appropriate" levels. Nearly a third of school-aged children in the region did not have access to the Internet prior to the pandemic. According to a UNICEF poll, 61% of kids in the ASEAN region do not receive any digital literacy education in schools, and teachers are mainly unfamiliar with new technology and how to use new tools (Galang, 2021).

All learning institutions were shut down early on March 20, 2020, and all citizens were encouraged to stay isolated to contain the spread of COVID-19, causing COVID-19 to be projected to negatively affect the performance of students in the 2020 Grade 12 national examination in mathematics, science, and design and technology subjects. The reported gradual rise in the number of the confirmed cases of COVID-19 and the low rates of the technological use in the Zambian secondary schools due to the unavailability of technology sources reveals a challenging time in a young country which has just recently launched the nationwide usage of STEM education. In this study, three teachers in a local secondary school in the Chipata District, in the Eastern Province of the Republic of Zambia were used to collect the data. The interviews were made with one science teacher, the mathematics department manager, and the director of the natural sciences department. Semi-structured phone interview with these experts was used to collect COVID-19 effects on the overall performance of students in their subject areas. The results of this research indicated that in case the COVID-19 pandemic cannot be under control within the shortest time possible, the success of secondary school students in national examinations is likely to reduce as far as the school academic calendar was abruptly disrupted with the issue of the untimely closure of all the schools in the country. Because learners will have decreased contact hours and lack access to communication with teachers when asking questions about their learning/understanding difficulties, the academic performance of students is bound to be poor during the classes taken to write end-year and internal exams (Sintema, 2020).

Teachers will be required to generate creative concepts to assist in breaking the constraints of virtual teaching. At local level teachers are willingly cooperating to come up with online teaching methods. Being of similar experience, teachers and parents, as well as children, have their prospects to collaborate and no rivals in finding imaginative solutions and being willing to learn, enjoy new methods, and share (Doucet, 2020). Most of the educational bodies that sell their tools and solutions are doing so at no cost to help and assist teaching and learning more interactively and engagingly. Online learning has enabled instructors and learners to learn and teach in a new manner that cannot be achieved in a conventional classroom environment.

The unexpected wave effect of the COVID-19 pandemic has been experienced by students, parents, and educators throughout the world as schools are shut down in response to the global pandemic. As governments, frontline employees, and health authorities are doing the best to contain the spread, the educational systems are trying to offer high standards of education to every student in such difficult times. Many students have suffered emotionally and psychologically at their home/living environment and have failed to provide effective interactions. Along with challenges, we should also have noted the opportunities COVID-19 brought to education: 1. This is a fantastic opportunity for teachers to establish stronger bonds with their students and their parents. Teacher-parent interaction is thought to be particularly important. In this circumstance, it is especially vital for kids with impairments.; 2. Teachers have the opportunity to create

innovative programs that help students overcome the limits of being physically separated (for example, play-based collaborative learning).; 3. There is plenty of evidence that instructors are actively collaborating at the local level.; 4. Many education-related businesses are promoting their products and services to assist teachers and kids for free (Petrie, 2020).

The comparative study on Blended Learning (BL) and traditional classroom instruction is done in Vrije Universiteit Brussel, where the effect of Blended Learning (BL) on the academic success of higher education students is considered. To carry out a statistical synthesis of research comparing student performance when using BL conditions with classroom instruction, a meta-analysis (k = 51 effect sizes) was performed. About moderating variables, the disciplines and the methods of end-of-course assessment by instructors are the moderating variables. The findings indicate that the effect of BL in terms of standard teaching methods was small (g + = 0.385, p = 0.001). The mean effect size in the projects of STEM subjects (g + = 0.496) was somewhat higher than in non-STEM fields (g + = 0.210). However, the weighted mean impact sizes do not exhibit significant differences, as regards the end-of-course evaluation, e.g., the one-moment and multiple-component assessments. The results indicate that the Blended Learning approach is interrelated with standards of greater learning performance in STEM-disciplined students in comparison to conventional classroom practice.

The current COVID-19 pandemic has caused utopia to countries and communities all over the world, disrupting systems that have been well realized in different industries and sectors. The education sector has been closed by closing schools to curb the transmission of the disease. Not less than 70 percent of the population is covered by these restrictions in the country. Localized closures applied in other countries affect millions of students, which is a quarter of the total population of students in the world. (UNESCO, 2020). The price of education as the foundation of any development does not go down due to the crisis. Some of the countries that have installed Competency-Based Education (CBE) include Zambia, Rwanda, Kenya, Tanzania, Nigeria, and South Africa among others. Even though African countries that have adopted Competency-Based Curriculum are currently receiving solutions to the local needs of their citizens, several challenges are experienced. The competency-based curriculum has also contributed to graduate standards as it has been applied in the industrialized countries (Ruth, 2019). The future artists, scientists, philosophers, innovators and leaders will be students. The competencies are necessary in equipping students with the knowledge, skills, and attitudes that they will require to be successful in their learning, living, and working experiences.

In such a way, the COVID-19 pandemic has affected nations and people all over the world causing the disruption of diverse businesses and other spheres. Schools have been closed as a measure of preventing the spread of disease in the education system. With the closure of schools addressed to the global pandemic, schools, parents, and educators worldwide have fallen victim to the unforeseen the COVID-19 epidemic. Due to the inability of all students to access the online environment, educators will be called upon to devise creative options to get around the shortcomings of virtual education. Instructional solutions and tools are numerous of them, free to assist and motivate more active and engaging teaching and learning in the new normal education everywhere in the world.

Most of 2020 and the beginning of 2021 in the Philippines setting saw schools shut. Most of the Indonesian students were of the same sentiment. In January, Malaysian, Mongolian, Myanese, and Thai schools reopened once again due to further outbreaks of COVID-19, which have devastated the effectiveness of educating children who had recently returned to classes. But suppose we go back to school this year. This most likely will be based on face-to-face learning in small courses, much online or digital learning or a combination of these formulations, which are based on the Philippine experience or a combination of the two. It has largely made internet learning not a viable long-term opportunity to millions of poor children. Digital learning at home is still out of reach of around 80 million children, and the pandemic is complicating the situation further. The hybrid system in the Philippines is a more plausible situation.

The Department of Education in the country has advocated blended learning as a desirable and legitimate way of providing education during and even after the COVID-19 outbreak. In the Philippines, 27 million students study in a remote learning module and, to a small degree, online. Even though some face-to-face learning is involved in the blended learning, some sections of the courses can be learned at home via online media and modules. Children do not need to go to school daily. Classes are fewer and so there is a few less students. Thus, much of the course could be studied at home (Maslog, 2021).

Some parents in the Philippines are concerned that their children's reading skills are deteriorating. According to a recent UNICEF survey, 80% of parents believe their children are learning less under the experimental system that combines digital and printed materials. The pandemic has also wreaked havoc on the region's economies and livelihoods. Child poverty is predicted to rise in tandem with the expected increase in poor households of roughly 140 million by the end of last year (Galang, 2021).

With Southeast Asian nations carefully implementing and starting to reopen schools after COVID-19 lockdowns, the new normal of education requires everyone to follow the guidelines of social health and continuous review of educational policy to make sure that no student is left behind. The matter has become a contention in the Philippines. The Department of Education of the country has announced that the basic education classes

would start on the 24th of August, even though Philippine President Rodrigo Duterte strongly said that they would not start until a vaccine is developed (Arkin, 2020).

With the perspective of the Basic Education Learning continuity plan, the Department of Education is also improving assessment through introducing an interim policy to assessment and grading. This has forced the instructor and parents to adjust to different learning styles to make sure that the students achieve their learning goals. This will require creative and innovative methods of creating the best learning environments and effectively tracking the learning process in unfavorable circumstances. According to the DepEd Order (DO) No. 8, s. 2015 which is the Policy Guidelines in Classroom Assessment in the K to 12 Basic Education Program, assessment must be used to inform and enhance teaching methods, and to improve learning outcomes. Nevertheless, other tools and strategies are needed in remote or hybrid learning contexts, which quantify and facilitate learning without unwarranted stress on the teachers, students, and their families (DepEd Order No.031 s. 2020).

The Department of Education is sharing the views of UNESCO which are that no single time can educational quality, access, and system strengthening be compromised (UNESCO, 2017). Consequently, the Department of Education renews its pledge to remain in offering quality, accessible, relevant and liberating Philippine basic education services. It will consistently aim at producing a complete Filipino student who is prepared with 21st-century skills. DepEd Order No. 012, s.2020 to offer a guideline of basic education delivery in the COVID-19 circumstances. It defined the standards and requirements of the provision of learning resources in the continued implementation of the BELCP. The learning materials also act as toolkits of learning to the learners, with the procedures, instructions, and other information being offered to assist the learning process all under the care of the responsible adults and constant supervision and guidance of the teachers.

According to this concept, this Department publishes the Most Essential Learning Competencies (MELCs) that will be adopted by field implementers and schools nationwide. DepEd offered the MELCs as the central model to all Schools, Schools Division Offices (SDOs) and Regional offices (ROs) in planning and implementing learning delivery strategies that are fitting in the local context and variations in learners and adjust to the challenges presented by COVID-19. The formation of MELCs was done through the retention, merging, rephrasing and/or dropping LCs. LCs are retained in case they pass the endurance test which is an important aspect in lifelong learning and is a necessity in the next grade level. In case two or more LCs have the same objective or learning intention, they are combined and united into one broad learning capability. LCs are reformulated so that they are more concise, or in other instances, more responsive and applicable to the new standard learning context of the situation. Lastly, LCs will be dropped when they are too specific and the same articulation as a learning objective they are deemed to be given at a previous quarter/grade or transferred to a later quarter/grade level; when they are repetitive, or even more basic to another learning competency. (MELCs Guidelines). These are the six Most Essential Learning Competencies in Science 9 1 st Quarter: Explain how respiratory and circulatory systems work together to move the nutrients, gases, and other molecules to and out of the various parts of the body; Infer how your lifestyle can influence the way respiratory and circulatory systems operate; Explain the chromosomal basis of inheritance; Explain the various patterns of non -Mendelian inheritance; Relate species extinction to the inability of populations of organisms to adapt to the sudden changes in the environment; Differenti According to (SCIENCE MELCs), the six Most Essential Learning Competencies in Science 9,Second Quarter are the following: Explain how the Quantum Mechanical Model of the atom describes the energies and positions of the electrons; Recognize different types of compounds (ionic or covalent) based on their properties which include temperature such as melting point, hardness, polarity, electrical and thermal conduction and how ions are formed and how the structure of the carbon atom influences the type of bonds to form, as well as, use the mole concept in calculating the mass

The self-study technique is an individualistic approach to learning. In-person learning is being phased out and distance learning is becoming more popular. Self-learning modules are customized in the way that the learner is in absolute control of what he/she learns, the manner of learning which is also controlled by the learner, when he/she learns it and where he/she learns it. Such flexibility is a major characteristic of the open learning process. This non-formal mode of learning is beneficial to the learner because he or she is able to study in self-paced learning materials. The teaching-learning-evaluation takes place in a way without any intercourse. Classes are not predetermined in terms of time and quantity. In a bid to guarantee the quality of Self-Learning Modules utilized in the modular distance learning modality, the Department of Education had laid down a guideline on the assessment of SLMs, especially those that students will make use of in subsequent grading periods. As categorized in the DepEd, quality learning resources empower teachers to better help and guide learners to acquire skills, knowledge and experiences that would help learners in both school and life. The DepEd claimed that SLM is made and designed to be used specifically by out-of-classroom learners, and in the situations when classes are interrupted, the face-to-face interaction between the learner and the teacher is minimal. SLMs will be provided to Learning is self-directed with the use of modules. Among the benefits of application of modules in instruction is that students acquire improved learning or self-studying abilities. The learners engage in the learning process of concepts in the module. By accomplishing the tasks provided in the module, they are made to

feel some level of responsibility. The learners develop independently with little or no support of other people. They are training the art of learning; they are empowered. Additional advantages of a modular instruction are: more student choice and self-pacing, more variety, flexibility on instructor and personal side, and more flexibility of instructional materials (Nardo, 2017).

A study on Grade 6 students in Claveria II District, Misamis Oriental for the School Year 2020-2021 on the extent of self-directed learning tasks and experiences recommended that school administrators and teachers design and use tailored learning activities and practices to the learner's abilities. As a result, students will be motivated to complete and respond to their own learning tasks, further developing their self-directed learning. Learning independently is difficult even for the brightest and most motivated students because it requires a great deal of discipline (Budiongan, 2020). According to a study of academic performance and student attendance at Misamis Oriental General Comprehensive High School, increased class attendance improves academic performance. Students should also recognize the significance of developing a good study habits. This will result in better academic performance of them. It is indicated that parents should be aware of the high role they play in the education of their children. Parents are expected to know how important it is to keep track of the academic achievements of their child (Baranda, 2020). Parents are facing challenges in modular distance learning modality that depends on the capabilities of the parent, the conduct of the child, and home learning environment. A study by Delas Penas (2021) states that students were unprepared to engage in independent learning using Modular Learning Modality. Educational institutions were obliged to adapt to a more flexible learning environment, students appear to have little choice but to focus on the viable modalities that are being presented, and no safeguards were put in place to ensure their readiness for this method of learning. Therefore over 27 million students in the country adhere to remote learning system where there is an active involvement of students learning the concepts presented in the self-learning module.

Theoretical Framework

This study is informed by the Cognitive Development Theory of Jean Piaget, according to which the learner actively builds their knowledge by interacting with the surrounding environment, passing through specific phases of cognitive development. Within the frame of the given research, Self-Learning Modules (SLMs) that correspond to the Most Essential Learning Competencies (MELCs) are developed to achieve this developmental process through presenting the structured but not rigid learning materials that enable students to study scientific concepts at their own pace. The focus of Piaget on developmentally relevant and learner-centered instructions will be compatible with a modular approach to learning that the Department of Education requires in the pandemic.

More so, the DepEd Frameworks of the Basic Education Learning Continuity Plan (BE-LCP) and associated policies (e.g., DepEd Order No. 031, s. 2020) also inform the proposed study, highlighting the need to have adaptive, accessible, and quality assured learning delivery in the context of disruptions. Such a curricular solution as the MELCs can be a simplified means to make sure the key competencies remain being learned and remembered even in a distance learning arrangement.

Together, Piaget's theory and the DepEd's continuity framework provide a cohesive theoretical foundation linking the design and implementation of MELC-based modules to students' academic performance, emphasizing the role of structured, competency-focused learning in promoting academic achievement during the new normal.

Conceptual Framework

Conceptual framework shows the hypothesized relationship between the learned competencies of the students that are part of Most Essential Learning Competencies (MELCs) and their academic performance in Science. The dependent variable (DV) is the level of the learned competencies measured with the help of the posttest results in Biology and Chemistry subjects based on DepEd MELC. The dependent variable (DV) is the academic performance of students in Science: the score on their grading period.

The framework presupposes that the increased mastery of MELCs results in the better knowledge and use of scientific concepts among students, which ultimately results in a better academic achievement. The correlational analysis was done to test this relationship based on Pearson's r. The study aims at investigating whether there is any meaningful significant positive relationship between competency mastery and academic achievement amidst the pandemic in the setting of the modular distance learning.

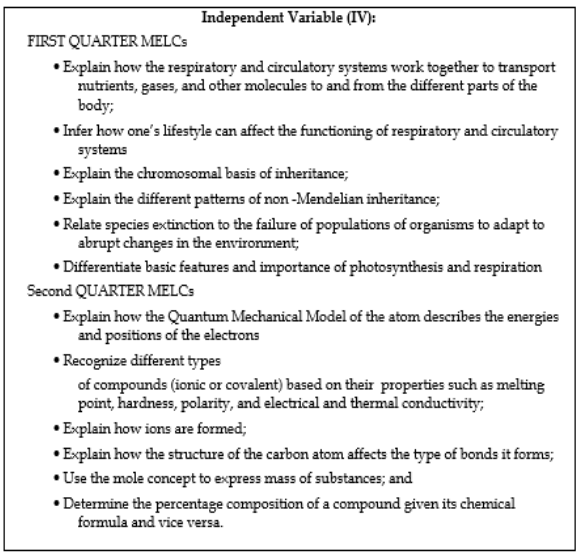


Figure 1: Dependent Variable (DV): Students' Academic Performance in Science

MATERIALS AND METHODS

Research Design

The research design used in this study was descriptive-correlational to establish the relationship between acquired competencies and performance in science among Grade 9 students. The design was considered most appropriate because it allowed the researchers to measure the degree of association between two variables—students' MELC-based competency scores and their academic performance grades—without manipulating any instructional or environmental conditions. This non-experimental design was applied by administering DepEd-aligned posttests and correlating the results with students' official grading period scores.

Population and Sampling

This research was done at Misamis Oriental General Comprehensive High School (MOGCHS) which was a public secondary school belonging to Division of Misamis Oriental. The respondents consisted of 946 Grade 9 students from 20 regular sections located in the QRF and Besra buildings, purposively selected based on the criterion that they were officially enrolled in Science 9 during the School Year 2021–2022. Student respondents came from sections such as Acts, Corinthians, Exodus, Galatians, and others, with class sizes ranging from 35 to 53 students per section. This sampling procedure ensured representation across different classrooms and teachers.

Instruments

Two data sources were utilized in this study. First, students' learned competencies were measured using DepEd-developed 10-item posttests aligned with the six Most Essential Learning Competencies (MELCs) per quarter—six for Biology (First Quarter) and six for Chemistry (Second Quarter). The instruments were used without modification and employed a scoring rubric that categorized performance into five levels: Very Well-Learned, Well Learned, Learned, Fairly Learned, and Less Learned. Second, academic performance was assessed based on the official grades in Science on the first and Second Grading period, which consisted of the record related to the achievement in school and were grouped into five descriptive scales: in the outstand, very satisfactory, satisfactory, satisfactory, and did not meet expectation. The two instruments were tested and put into use within the DepEd assessment policies.

Data Collection

The researcher would request the Schools Division Superintendent of Misamis Oriental to give consent before the data was collected. After the permission was obtained, the object and methodology of the study was well-illustrated to the teachers and school leaders involved, whose informed consent was obtained. The MELC-based posttests were administered to Grade 9 students in their respective classrooms during scheduled periods, with the assistance of their Science teachers. Student academic performance data were gathered from official school records with the coordination of the school's registrar and academic heads. All collected responses and grades were carefully checked for completeness and consistency before being encoded for analysis.

Treatment of Data

Quantitative analysis of data collected was carried out in descriptive and inferential statistics. Other descriptive statistics that included weighted means, frequencies and percentages were employed to describe the levels of learned competencies and academic performance. The correlation that existed between academic performance in Science and learned competencies was analyzed in terms of Pearson correlation coefficient (r). This discussion provided the power and the course of the association among the two variables. Results had been presented in tabular format that was understandable.

Ethical Considerations

In this study, the ethical standards of investigating education were observed. The school administration and the Division Office were consulted to give approval of the study to be conducted prior to data collection. The official permission of the division and school levels implied informed consent, and student data were processed confidentially, with only aggregated outcomes reported, making the identification of a particular student impossible. The information that was gathered was purely academic and research based, and the data was stored safely and processed in accordance with policy of data privacy provided by DepEd.

RESULTS AND DISCUSSION

In this section, the overview of the performance of respondents in relation to the learned competencies in the Most Essential Learning Competencies (MELCs) is offered. In this case the level of mastery of the respondents in Biology (First Grading) and Chemistry (Second Grading) is presented.

Profile of the Respondents on Biology and Chemistry Learned Competencies

This section shows the students' learned competencies in the Science subject.

Table 1 shows the level of acquired competencies of Grades 9 students in Biology in the First Grading period. The general average of 2.60 (Fairly Learned) is a pointer of the respondents in general having difficulties in mastering the Biology competencies in the modular learning environment. Top rated competencies were explaining the respiratory and circulatory system (M = 2.67, Learned), whereas lowest ones were in topics about species extinction and photosynthesis/respiration (M = 2.50 and 2.54, Fairly Learned) which shows that abstract and application-based issues are hard.

These results are consistent with the experiment of Byukusenge *et al.* (2022), who observed that the subjects,

Table 1: Level of Learned Competencies of Grade 9 Students in Biology (First Grading)

Most Essential Learning Competency (MELC) – Biology	**Mean**	**Description**	**Interpretation**
Explain how the respiratory and circulatory systems work together to transport nutrients, gases, and other molecules to and from the different parts of the body.	2.67	Learned	Learned
Infer how one's lifestyle can affect the functioning of respiratory and circulatory systems	2.67	Learned	Learned
Explain the chromosomal basis of inheritance	2.63	Learned	Learned
Explain the different patterns of non-Mendelian inheritance	2.61	Learned	Learned
Relate species extinction to the failure of populations of organisms to adapt to abrupt changes in the environment	2.50	Fairly Learned	Fairly Learned
Differentiate basic features and importance of photosynthesis and respiration	2.54	Fairly Learned	Fairly Learned
Overall Mean	2.60	Fairly Learned	Fairly Learned
Most Essential Learning Competency (MELC) – Chemistry	Mean	Description	Interpretation
Explain how the Quantum Mechanical Model of the atom describes the energies and positions of the electrons	3.32	Learned	Learned
Recognize different types of compounds (ionic or covalent) based on their properties such as melting point, hardness, polarity, and electrical and thermal conductivity	3.77	Well Learned	Well Learned
Explain how ions are formed	2.93	Learned	Learned
Explain how the structure of the carbon atom affects the type of bonds it forms	2.74	Learned	Learned
Use the mole concept to express mass of substances	2.69	Learned	Learned
Determine the percentage composition of a compound given its chemical formula and vice versa	3.66	Well Learned	Well Learned
Overall Mean	2.60	Learned	Learned

	Interval	Level of Learned Competence
5	4.20-5.00	Very Well Learned
4	3.40-4.19	Well Learned
3	2.60-3.39	Learned
2	1.80-2.59	Fairly Learned
1	1.00-1.79	Less Learned

which involve previous knowledge and conceptual synthesis, including genetics, evolution, and ecosystem processes, are usually perceived as challenging by remote learning students. On the same note, Lieu *et al.* (2018) pointed out that learners who do not have practical tasks or teacher guidance also struggle to learn the various organ systems and biological processes.

Learners showed easy understanding but failed to grasp advanced understanding especially skills that needed critical and critical thought. This implies that there should be increased scaffolded and active module design, particularly in complicated biological ideas.

The level of the competencies learned in the area of Chemistry during the Second Grading period is also presented in Table 1. The net mean of 3.19 (Learned) means that the performance of students is better than the first grading. The most highly rated competency was identifying types of compounds (M = 3.77, Well Learned) and the lowest was in the application of the mole concept (M = 2.69, Learned), which suggests that computational subjects were still hard.

These findings align with the results of Cardak and Dikmenli (2016), who opined that learners tend to achieve better in concrete, classification-related science subjects compared to those where mathematical reasoning of abstract modeling is required. The difference between Fairly Learned and the Learned is also indicative of the possible modification of the student to the modular format.

Although the mastery of competencies in the area of Chemistry among students yielded an improvement, it may be improved, especially in developing quantitative and conceptual reasoning, through the other means of increased examples, practice activities, and teacher-led remediation.

Profile of the Respondents on Academic Performance

This section shows the students' academic performance in the Science subject.

Table 2: Frequency Distribution of Students according to the Level of Academic Performance in the Science Subject

Level of Academic Performance (First Grading)	**Frequency**	**Percentage**
90 and above (Outstanding)	25	2.6%
85 to 89 (Very Satisfactory)	37	3.9%
80 to 84 (Satisfactory)	89	9.4%
75 to 79 (Fairly Satisfactory)	795	84.0%
Below 75 (Did not meet expectations)	0	0%
TOTAL	946	100
Level of Academic Performance (Second Grading)	Frequency	Percentage
90 and above (Outstanding)	26	2.7%
85 to 89 (Very Satisfactory)	68	7.2%
80 to 84 (Satisfactory)	227	24.0%
75 to 79 (Fairly Satisfactory)	625	66.1%
Below 75 (Did not meet expectations)	0	0%
TOTAL	946	100%

Range	Interpretation
90 and above	Outstanding
85 to 89	Very Satisfactory
80 to 84	Satisfactory
75 to 79	Fairly Satisfactory
Below 75	Did not meet expectations

Table 2 indicates that most students (84.0% below the range of Fairly Satisfying (7579)) in the First Grading period were in the satisfactory range of (8084) or 9.4%. Very few attained upper levels of performance: only 3.9% declared themselves to be Very Satisfied, and only 2.6% declared themselves to be outstanding. None scored below 75.

This implies that the overall performance of the students was overall good but most students were at the level of basic competencies in the first quarter. These findings indicate how difficult students found it to adjust to modular learning, especially the ability to master complex topics in the study of Biology with limited teacher interaction.

It is also in Table 2 where one can notice a slight difference in the performance in the Second Grading period. Although most of them still fell in the Fairly Satisfactory category (66.1%), there was a rise in the "Satisfactory" category (24.0%), as well as a satisfied "Very Satisfactory" category (7.2%). The outstanding group was comparatively low at 2.7%.

This enhancement implies that learners got used to modular learning as time progressed and scored higher in Chemistry than in Biology. Nevertheless, the inability to eliminate a significant share of the percentage range in the category of Fairly Satisfactory points to the continued problem of attainment of higher academic results in a distance learning environment.

Such results are consistent with those of Cruz (2021), who also established that modular learning in the pandemic tended to support students to pass the minimum requirements but fail to attain higher levels of mastery since minimal supervision, motivation, and engagement are parts of the modular learning. The findings highlight the fact that there is a need to improve the teaching and learning conditions in the form of a better structure of modules designed to assist students in adapting to simple and high-order learning outcomes.

Relationship between Learned Competencies and Academic Performance

The last part of this chapter highlights the correlation between their acquired competencies of the Most Essential Learning Competencies (MELCs) and their academic achievement in Science. The discussion points out the level on which competency mastery leads to academic success.

The correlation analysis in Table 3 showed that the coefficient r = 0.989, p= 0.000 which indicates that the relationship between the level of competencies learned in students and their performance in Science is very high, positive, and statistically significant. It means that the increased mastery of MELCs is closely related to the academic achievement.

This finding is in line with the competency-based education of DepEd and it is also consistent with other studies like those by Nardo (2017) which reported a positive effect of well-designed competency-linked instructional resources on learning especially self-directed learning. This correlation is strong, and this highlights that MELC mastery is important in determining success of students in modular distance learning.

The results verify that the acquisition of competency among students is not an activity in academics but rather

Table 3: Correlation between Learned Competencies and Academic Performance

Variable 1	Variable 2	Correlation Coefficient	Interpretation	P-value	Interpretation
Learned Competencies	Academic Performance	.989	Very High Correlation	.000	Highly Significant

a direct indicator of performance. The findings support the idea of the constant quality support in Self-Learning Modules and the special consideration of instruction support to make sure that students do not simply pass the learning but also actually possess mastery over the necessary learning outcomes.

Recommendation based on the results of the study

The results imply that specific design and content changes of Self-Learning Module (SLM) could be suggested, with the focus on competency-based, student-focused material that is engaging and pedagogical. This concurs with the ensuring of quality and a learning resource that is available in the Basic Education Learning Continuity Plan (DepEd Order No. 031, s. 2020).

Conclusions

The given study investigated how the acquired learning competencies of the Most Essential Learning Competencies (MELCs) relate to the academic results of the scientific domain in Grade 9 learners in Misamis Oriental General Comprehensive High School in the School Year 2021-2022. The results showed that the students overall achieved measurable levels of competency mastery with the overall performance rated as Fairly Learned in Biology (First Grading) and Learned in Chemistry (Second Grading). The majority of academic performance both during grading periods were rated as Fairly Satisfactory, which implies that students did not fall below what was expected, but there is much more that can be done to attain higher academic results. In the correlation analysis, the positive relationship between academic performance and learned competencies was very strong, statistically significant and high positive relationship (r=.989r=.989, p=.000p=.000). This implies that MELC mastery is not a pure administrative measure but as substantive variable and it has a direct impact on student achievement in modular distance learning. The findings highlight the importance of making sure that not only students will fail to complete but they also, in fact, master the key competence areas, especially in the difficult science disciplines. Overall, the research concludes that the ability to achieve competency by improving instructional materials, teacher support across time, and students involvement is critical to improving student academic outcomes in the new normal education setup.

Recommendations

The results and recommendations given are based on the findings and conclusions. To begin with, the Department of Education and the school administrators must pay special attention to the design, testing, and constant improvement of high-quality Self-Learning Modules (SLMs) that are attentive to MELCs, interactive and responsive to different learner needs. Second, systematic evaluation of competency mastery should be implemented through systematic MELC-based recognition and feedback systems which should be incorporated in teacher training programs by policymakers and curriculum developers in order to effectively deliver curriculum content and monitor achievement of the content. Third, schools ought to enhance the instructional support programs such as frequent teacher-student conferences, peer tutoring, and e-mentoring so that students can get out of learning challenges particularly the abstract and computation-intensive science subjects. Fourth, parents and guardians are not only being urged to have an active role in tracking the modular learning development of their children and keeping in touch with the teachers to aid effective academic participation. Lastly, more severe studies that incorporate greater population sizes and more diversity, longitudinal methodologies, and mixed-method forms of study are suggested to enhance the knowledge about MELC mastery as it is converted into the ultimate academic achievement achieved in a wide array of learning delivery methods and subject disciplines.

CONCLUSION

This study examined the relationship between acquired learning competencies in the Most Essential Learning Competencies (MELCS) and the academic performance in Science of Grade 9 learners at Misamis Oriental General Comprehensive High School during School Year 2021-2022. The findings revealed that students achieved measurable levels of competency mastery , with overall performance rated as Fairly Learned in Biology (First Grading) and Learned in Chemistry (Second Grading) .Academic performance across both grading periods was generally rated as Fairly Satisfactory, indicating that while students met minimum expectations , there remains substantial room for improvement. Correlation analysis demonstrated a very strong , statistically significant positive relationship between academic performance and competency mastery (r= .989, p=.000). This finding underscores that MELC mastery is not merely an administrative benchmark but a substantive variable directly influencing student achievement in modular distance learning. The results highlight the necessity of ensuring that students not only complete tasks but also genuinely master key competencies, particularly in challenging science subjects. In conclusion, improving instructional materials , providing sustained teacher support , and enhancing student engagement are critical strategies for raising academic outcomes in the new normal educational landscape.

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