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SELF-LEARNING PRINTED MODULE AND SELF-LEARNING ANIMATED VIDEO PRESENTATION: THEIR EFFECTS ON THE ACADEMIC PERFORMANCE OF GRADE 10 LEARNERS IN CHEMISTRY

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ABSTRACT

This quasi-experimental study examined the effects of self-learning printed modules and animated video presentations on the Chemistry performance of Grade 10 learners in a city school in Iloilo City during the School Year 2025–2026. Using a researcher-made pretest and post-test instruments, the results revealed that the total pretest performance of Grade 10 learners with the SLPM and SLAVP was described as satisfactory. There was no significant difference between the pretest performance of the Grade 10 learners in Chemistry before using the SLPM and SLAVP. The post-test performance of the Grade 10 learners in Chemistry after using the SLPM and SLAVP were both described as very satisfactory. There was no significant difference between the post-test performance of the Grade 10 learners in Chemistry after using the SLPM and the SLAVP. There was a strong significant difference between the pretest and post-test performance of Grade 10 learners in Chemistry using both the self-learning printed module (SLPM) and the self-learning animated video presentation (SLAVP). There was no significant difference in the mean gain performance of the Grade 10 learners in Chemistry using the SLPM and the SLAVP during the fourth grading of the current school year.

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Keywords: *Self-learning printed modules, Self-learning animated video presentation, Academic Performance, Learners, Chemistry*

INTRODUCTION

Background of the Study

Empirical studies across multiple contexts during the last five years report that animated, and video-based instructional materials generally improve learners' performance in science subjects—including chemistry—relative to static or solely text-based materials. Experimental and quasi-experimental investigations show higher posttest scores, improved retention, and greater learner engagement following instruction that uses animation, simulation, or teacher-designed video lessons for chemistry topics (Umanah & Atabang, 2025).

In the Philippine and regional context, localized studies and program reports indicate that video-based instruction, teacher-produced animated modules, and virtual laboratory initiatives can boost understanding and retention in chemistry and other sciences—especially when teachers receive training on integrating these resources with inquiry-oriented pedagogy. These localized findings support the broader international evidence that technology's positive effects are conditional on alignment with curriculum goals, teacher preparedness, and reliable access to devices and connectivity (Roy & Biscocho, 2023).

At the same time, self-learning printed modules (SLMs) remain essential in many educational systems—particularly where internet access is limited. In the Philippines, the Department of Education continues to support modular and blended delivery modalities and

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issues "ready-to-print" SLMs to ensure continuity of learning; these printed modules are widely used for individualized study and are designed to scaffold learners through explanations, worked examples, and practice tasks aligned to the curriculum. The sustained policy emphasis on modular learning highlights the practical importance of comparing printed SLMs with multimedia alternatives in local classrooms (Deped 2022).

Conversely, animation excels at weaving emotional depth into storytelling, fostering a profound connection between the audience and the narrative. By blending sound, imagery, and plot, it creates a powerful experience that leaves a lasting mental impression. This impact makes animation a highly effective tool for education; it transforms learning into an engaging process that often outperforms traditional methods. According to Jou et al. (2022), educators leverage these dynamic visuals to capture student attention and improve information retention through high-impact graphics.

Comparative research specifically contrasting printed SLMs and animated video presentations in secondary chemistry is still emerging. A handful of recent regionally focused studies report favorable effects for animated or video instruction over static print in targeted chemistry topics (for example, isomerism and reaction concepts), but findings vary depending on the fidelity of the media design, the presence of active learning prompts, and contextual factors such as learner access to devices and facilitation support. This mixed but generally positive evidence base motivates systematic, context-sensitive comparisons among Grade 10 learners (Umanah & Atabang, 2025).

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It was along this line that this study was conducted in the hope of improving the performance of learners in Chemistry by giving them an alternative teaching strategy in modular distance learning, which consisted of self-learning printed modules and video presentations where learners were given a thorough discussion of the lesson through videos.

The researcher further believed that both self-learning modules and animated videos could facilitate learners' needs in a variety of ways, especially in the improvement of their performance. Thus, this study was conducted.

MATERIALS AND METHODS

Research Methodology

This chapter outlines the methodological framework of the research, detailing the specific research design, the study's participants, and the sampling techniques employed. It further describes the procedures for data collection, the research instruments utilized, and the statistical tools and data analysis methods applied to the findings. The primary objective of this investigation is to evaluate the comparative impact of printed self-learning modules and animated self-learning video presentations on the academic performance of Grade 10 students at Ramon Avanceña National High School in Iloilo City during the 2025-2026 academic year.

Research Method

This study used experimental method. The experimental method according to McLeod (2023) is a research strategy used to establish cause-and-effect relationships between variables. In this method, the researcher manipulates one or more variables (independent

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variable[s]) and observes the effect on another variable(s) (dependent variable[s]), while controlling for extraneous (confounding) variables.

For this study, the independent variables are self-learning modules and self-learning animated video presentation while the dependent variable is the academic performance of learners in Chemistry.

Research Design

This study employed a quasi-experimental research design incorporating a pretest and post-test methodology. This approach blended descriptive and experimental techniques to evaluate the impact of two distinct educational materials: self-learning printed modules, which served as the independent variable for the experimental group, and self-learning animated video presentations, which served as the independent variable for the control group. The dependent variable under observation was the academic performance of the students in Chemistry. As defined by Fabrigar (2024), a quasi-experimental design was a quantitative research framework used to examine cause-and-effect relationships between a treatment and an outcome without the use of random assignment to categorize subjects into their respective groups.

This specific research design was selected because the primary goal of the investigation was to measure the variations in academic achievement among Grade 10 learners at Ramon Avancena National High School in Iloilo City. By comparing performance data collected before and after the introduction of the self-learning modules and animated video presentations during the 2025-2026 academic year, the researchers aimed to determine

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the overall effectiveness of these interventions. The design allowed for a structured assessment of how these different instructional modalities influenced the learners' mastery of the subject matter within their natural school environment.

Participants of the Study

The participants of the study were sixty (60) Grade 10 learners who are officially enrolled during the school year 2025-2026. These participants were taken heterogeneously with representative from other sections regardless of their general average.

The learners were divided into two groups. One group composed of thirty (30) learners were exposed to self-learning animated video presentations and the other group of thirty (30) learners were exposed to printed modules.

In determining the participants of the study, the researcher applied the tossing of a coin to decide which participants would be in the control group and the experimental group. Group A (30 learners) was assigned to the self-learning animated video lesson presentation, while Group B (30 learners) was assigned to the self-learning printed module.

The distribution of the number of subjects per group in this study is hereby presented in Table 1.

Table 1

Distribution of Participants per Group According Its Type of Learning Resource Materials

Learning Resource Materials	N	%
Printed Modules	30	50%
Animated Video Presentation	30	50%

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Total	60	100%

Sampling Design

A purposive sampling design was utilized to select the participants for this study, as this method allowed the researcher to maintain homogeneity, ease of implementation, and greater control throughout the process. According to Nikolopoulou (2023), purposive sampling—also referred to as judgmental or selective sampling—is a non-probability technique in which researchers deliberately choose specific participants or units based on particular characteristics that are directly relevant to the objectives of the research. In an experimental or quasi-experimental design, purposive sampling might be used when the researcher has clear criteria for who should receive the intervention (or be in the control/comparison group), and when random sampling is not feasible or not necessary for the research goals.

Research Instrument

To gather the necessary data for the study, the researcher initially constructed a 60-item multiple-choice examination in Chemistry. This instrument was designed to evaluate the academic performance of the learners by utilizing a pre-test and post-test format, specifically focusing on the scientific principles of Boyle's Law and Charles' Law.

The questionnaire subsequently underwent a rigorous process of content and face validation. This evaluation was conducted by a panel consisting of three Chemistry subject matter experts and two Information Technology specialists with expertise in animation and editing. The validation process utilized the eight-point criteria established by Good and Scates

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(1972), as cited by Soqueña (2021). All comments, suggestions, and professional recommendations provided by these experts were then integrated into the final version of the research instrument.

Validity of the Research Instrument

Before the researcher finalized the validity of the research instrument, the research adviser, the Dean of the Graduate School, and a panel of jurors—selected for their specialized expertise in research methodology, testing, assessment, and Science—were requested to validate and review each question for necessary modifications. This rigorous evaluation ensured that the instrument was refined according to professional standards before being deployed for data collection.

The concept of validity was central to this process, as it refers to the degree to which a study's findings, interpretations, and conclusions accurately and meaningfully represent the specific concepts being examined. As noted by Creswell and Creswell (2023), establishing validity ensures that a research instrument truly measures its intended variables and that the resulting data serves as a credible reflection of reality. To achieve content validity, the researchers ensured that the questions and the overall format of the instrument were strictly aligned with the study's defined objectives. This required an expert review to confirm that every item was relevant, clear, and representative of the theoretical framework, thereby enhancing the overall accuracy and utility of the gathered data.

All comments, corrections, and constructive suggestions provided by the validation panel regarding the interview schedule were carefully incorporated. This evaluation was

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documented using the standardized criteria established by Good and Scates (1972), as cited by Soqueña (2021), the details of which were recorded in the appropriate validation forms found in Appendix A.

Reliability of the Research Instrument

The validated instrument was then subjected to reliability testing using item analysis and Cronbach alpha to 30 Grade 10 learners of the same school but not involved in the final administration of the test to make the data reliable.

Reliable data increases the credibility of research findings. When instruments are reliable, researchers and readers can trust that the results are not due to random error or noise (Olmsted, 2024). The reliability of the research instrument must be taken into consideration before it will be used for final administration.

According to Mokkink (2023), reliability testing refers to the process of evaluating a research instrument (e.g., questionnaire, scale, clinical measure) to determine how consistently and precisely it produces measurement results under repeated or varied conditions. It quantifies the amount of measurement error (random variation) in observed scores by assessing how much of the total variance is due to "true" differences rather than error.

The reliability of the questionnaire was determined using Cronbach alpha. An alpha coefficient of 0.70 or higher would declare the questionnaire reliable.

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Data Gathering Procedures

The researcher prepared a study plan that included Lesson Matrix of Activities for both self-learning printed modules and self-learning animated video presentation and camo up with a classroom scheme that was strictly followed during the 20-day study implementation.

The implementation of the study was divided into three distinct phases: the pre-experimental stage, which involved the preparation of educational materials and the assessment of the research instrument's validity and reliability; the experimental stage, consisting of four weeks or 20 consecutive days of instruction using self-learning animated video presentations for the experimental group and self-learning printed modules for the control group; and the post-experimental stage, which focused on the interpretation and analysis of the collected data.

Pre-experimental Stage. During the pre-experimental stage, the researcher secured the necessary permissions from the research adviser, the Dean of the Graduate School, and the Schools Division of Iloilo City. Additionally, a courtesy call was arranged with the school principal to ensure all formal protocols were followed, including the coordination of consent from both parents and individual participants. The participants were purposively chosen from the total enrollment of Grade 10 learners. Both the experimental and control groups were administered a pretest to determine their level of science performance as baseline data.

Experimental Stage. During the experiment, the researcher coordinated with the adviser for the conduct of the study. The adviser distributed the soft copy of the Self-Learning

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Animated Video Presentation through Google Classroom and/or via USB to Group A, while the Self-Learning Printed Module was provided to Group B over seven weeks of the fourth quarter. Group A received the soft copy of the Self-Learning Animated Video Lesson Presentation with instructions from the adviser to view the videos and perform the assigned tasks as instructed. Conversely, Group B received the self-learning module with instructions from the adviser to read the material and complete the tasks provided within the module.

Post-experimental Stage. During the post-experimental stage, a post-test was administered to both the experimental and control groups following the conclusion of the intervention to assess their final academic performance. The resulting data were then collected, digitally processed, and organized into tables for comprehensive analysis and interpretation using appropriate statistical methods.

Data Analysis

The research instrument was reproduced in a quantity that matched the total number of study participants. Following the retrieval of the completed questionnaires, the collected data were systematically organized, calculated, and tabulated.

The information gathered during this research was subjected to specific computer-processed statistical tests utilizing the Statistical Package for the Social Sciences (SPSS) software. For the analysis phase, the researcher employed the following scale of scores and interpretations, which were adopted from the Department of Education's (DepEd) standards for assessing learners' academic performance in Chemistry:

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Mean of Scores	Description
40.01 – 50.00	Outstanding (O)
30.01 – 40.00	Very Satisfactory (VS)
20.01 – 30.00	Satisfactory (S)
10.01 – 20.00	Fairly Satisfactory (FS)
0.00 – 10.00	Did Not Meet Expectation (DNME)

Statistical Tools

The statistical tools employed in this study included the mean, mean rank, the Mann-Whitney U-test, and the Wilcoxon signed-rank test, with the level of significance set at .05.

Mean. As the most frequently utilized and easily calculated measure of central tendency, the mean was used to determine the average of the participants' responses. The resulting values described the students' academic performance in Physics both prior to and following the experimental intervention.

Mann-Whitney U-Test. This non-parametric test was utilized to identify whether a significant difference existed between the means of two independent variables. Specifically, it was applied to the pre-test and post-test results of the Grade 10 learners to compare the effectiveness of the self-learning printed modules against the self-learning animated video presentations. This statistical analysis determined if there was a significant disparity between the class means of the two groups and was further used to evaluate if a significant difference existed in the mean gains of their chemistry achievement scores.

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Wilcoxon Signed-Rank Test. This non-parametric statistical hypothesis test was used to compare the locations of two populations using matched samples. Similar in purpose to a one-sample student's t-test, this version allowed the researcher to test the population's location based on the provided data samples to ensure a rigorous comparison of the related groups. In this study this statistical tool was used to investigate if there is any change in score from one time point to another especially on the results of their performance in printed module and animated video presentation.

RESULTS AND DISCUSSIONS

The primary objective of this investigation was to determine the impact of self-learning printed modules and animated video presentations on the academic achievement of Grade 10 Chemistry students. The research was conducted at Ramon Avanceña National High School within the Schools Division of Iloilo City during the 2025–2026 academic year.

The participants of the study were the sixty (60) Grade 10 learners who are officially enrolled during the School Year 2025-2026. They were taken heterogeneously with representative from other sections regardless of their general average.

The learners were divided into two groups. One group composed of thirty (30) learners was exposed to self-learning animated video presentations and the other group of thirty (30) learners was exposed to printed modules.

The data collection process utilized a custom-designed questionnaire developed specifically for this research. To ensure the tool's accuracy and relevance, it underwent a

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rigorous content validation process by a panel of subject matter experts. Following this, the instrument was pilot-tested among sixty (60) Grade 10 students, with the group divided equally— thirty (30) learners engaged with the printed module and thirty (30) with the animated video presentation—to refine the assessment before full implementation.

The methodological framework for this study was a quantitative, quasi-experimental two-group pretest-posttest design. This specific approach involves establishing a comparison group that mirrors the experimental group's baseline characteristics as closely as possible. By doing so, the researcher can effectively isolate the impact of the intervention, as the comparison group serves as a baseline to demonstrate what the educational outcomes would have been in the absence of the new programs or policies.

For the analytical phase, the researcher employed the mean, mean rank, the Mann-Whitney U-test, and the Wilcoxon signed-rank test, maintaining a significance threshold of .05. The physical instruments were reproduced to match the total number of participants involved in the study. Once the completed questionnaires were retrieved, the resulting data were systematically organized, calculated, and tabulated using the Statistical Package for the Social Sciences (SPSS) software for precise interpretation.

The findings of the study were as follows;

The mean of the total pretest performance of Grade 10 learners with the self-learning printed module and self-learning animated video presentation was described as satisfactory.

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There was no significant difference between the pre-test performance of the Grade 10 learners in Chemistry before using the self-learning printed module and self-learning animated video presentation.

The post-test performance of the Grade 10 learners in Chemistry after using the self-learning printed module and self-learning animated video presentation were both described as very satisfactory.

There was no significant difference between the post-test performance of the Grade 10 learners in Chemistry after using the self-learning printed module and the self-learning animated video presentation.

There was a strong significant difference between the pre-test and post-test performance of the Grade 10 learners in Chemistry using the self-learning printed module.

There was a strong significant difference between the pre-test and post-test performance of the Grade 10 learners in Chemistry using the self-learning animated video presentation.

There was no significant difference in the mean gain performance of the Grade 10 learners in Chemistry using the self-learning printed module and the self-learning animated video presentation in Ramon Avanceña National High School, Arevalo, Iloilo City during the fourth grading of the Academic Year 2025-2026.

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CONCLUSION

In the light of the findings and insights derived from the study, the following recommendations are forwarded:

Teachers should continuously refine their instructional strategies to create more dynamic and engaging learning environments. Beyond the classroom, they should provide consistent coaching through home visits, video calls, or daily interactions. This sustained mentorship bridges learning gaps, fosters resilience, and ensures that students feel supported in both their academic and personal growth.

School Districts and School Heads are encouraged to integrate technology-enhanced programs, such as animated video instruction, into regular in-service training. School heads should specifically leverage their teachers' individual strengths to implement the findings of this study, ensuring that research-driven strategies are effectively translated into classroom practice.

DepEd Officials should establish policy frameworks and allocate resources that empower schools to sustain evidence-based practices. By systematically disseminating research findings across regions, the Department can provide the clear guidelines and funding necessary to promote instructional equity and innovation nationwide.

Education Program Supervisors should act as the bridge between policy and practice. By providing ongoing coaching, facilitating professional learning communities, and offering constructive feedback, supervisors help teachers refine their methods and build confidence in delivering new instructional modalities.

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Future Researchers are encouraged to replicate this study in other National High Schools and across various grade levels. Expanding the scope of this research may help identify broader trends and additional methods to further refine science instruction in the modern era.

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Available online at https://www.instabrightgazette.com

References

Abbarra, A. (2024). Effectiveness of Printed Modules in the Performance of Grade VI Learners in Science of Baquioen Elementary School. (Action research / ResearchGate, 2024).

Batita, M. S. R., & Chen, Y.-J. (2022). Revisiting Transactional Distance Theory in e-Learning Environment during COVID-19: Perspective from Computer Science Students. *International Journal of Information and Education Technology*, 12(6), 548–554. https://doi. org/10.18178/ijiet.2022.12.6.1652

Benito, S. M., Bantulo, J. S., & Haudar, F. S. (2022). Effectiveness of self-learning modules (SLM) in teaching Mathematics 3. International Journal of Recent Research in Thesis and Dissertation, 3(1), 33–45. https://doi. org/10.5281/zenodo.6497186.

Bevan, B., Ryoo, J. J., Vanderwerff, A., Wilkinson, K., & Petrich, M. (2020). *"I See Students Differently": Following the lead of maker educators in defining what counts as learning*. *Frontiers in Education, 5*, Article 121. https://doi.org/10.3389/feduc.2020.00121.

Bibon, M. B. (2022). Teachers' Instructional Practices and Learners' Academic Achievement in Science. *Contemporary Mathematics and Science Education, 3*(1), ep22007. https://doi.org/10.30935/conmaths/11816.

Bustillo, E. (2022). The challenges of modular learning in the wake of COVID-19. *Education Sciences*, 12(7), 449. https://doi.org/10.3390/educsci12070449. (empirical study analyzing printed remote learning submission rates and challenges). https://www.mdpi.com/2227-7102/12/7/449

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
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Available online at https://www.instabrightgazette.com

Camay, R. (2022). *The Academic Performance of Grade 10 Mathematics Learners Exposed to Hybrid Learning and Printed Modular Distance Learning.* eJournals.ph (2022).

Canuto, P. P., Choycawen, M., & Pagdawan, R. (2024). The influence of teaching competencies on teachers' performance and students' academic achievement in primary science education. Problems of Education in the 21st Century, 82(1), 29– 47. https://doi.org/10.33225/ pec/24.82.29.

Cox, D. (2022). *Insights for delivering VET online.* NCVER. Downloaded from https://files.eric.ed.gov/fulltext/ ED617739.pdf?utm_source=chatgpt.com on November 24, 2025.

Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed method approaches (6th ed.). SAGE Publications.

Dapa, B.C. and Valdez, G.M. (2021). Printed Self-Learning Module Distribution and Completion Preferences of Grade 7-12 Students of Tagugpo National High School in Davao Oriental, Philippines: A Conjoint Analysis Davao Research Journal, 12(1), 54-68. https://doi.org/ 10.59120/drj.v12i4.32

Day, D. V., Fleenor, J. W., Atwater, L. E., Sturm, R. E., & McKee, R. A. (2021). *Unlocking Human Potential through Leadership Training & Development*. Human Resource Development International, 24(2), 115-130. https://doi. org/10.1080/13678868.2020.1855646

Department of Education (DepEd). (2022). *DepEd Data Bits: Learning Delivery Modalities, SY 2021–2022* (Fact sheet, July 2022). Retrieved from https://www.deped.gov.ph/wp-content/uploads/2022/08/7-Databits-Learning-Delivery-Modalities-Jul.pdf.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
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February 2026
Available online at https://www.instabrightgazette.com

Department of Education (Philippines). (2021, January 4). DO 001, s. 2021 — Guidelines on the Evaluation of Self-Learning Modules for Quarters 3 and 4 for School Year 2020–2021. Department of Education. Retrieved from https://www.deped.gov.ph/2021/01/04/january-4-2021-do-001-s-2021-guidelines-on-the-evaluation-of-self-learning-modules-for-quarters-3-and-4-for-school-year-2020-2021/.

Department of Education (Philippines). (2021, September 20). DepEd assures to provide quality self-learning modules for School Year 2021–2022 (Press release). https://www.deped.gov.ph/2021/09/20/deped-assures-to-provide-quality-self-learning-modules-for-school-year-2021-2022/.

Dewi, D. A. & Elisa, E. I. (2025). Implications of Constructivism Theory in Elementary School Science Learning: Systematic Literature Review. EduHumaniora: Jurnal Pendidikan Dasar, 17(2), 199–210. https://doi.org/10.17509/eh.v17i2.86250

Dewi, P. A. M. K., & Hidayati, Y. M. (2023). *The need analysis for development of animated video to foster independent attitude in science subject.* In *Proceedings of the International Conference on Learning and Advanced Education (ICOLAE 2022)* (pp. 1746–1754). Atlantis Press / Springer. https://doi.org/10.2991/978-2-38476-086-2_140.

Dya, A. U., Lagurab, J. C., and Baluyosb, G. R. (2024). Using PhET Interactive Simulations to Improve the Learners' Performance in Science. EduLine: Journal of Education and

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

Learning Innovation. ISSN: 2775-6173 (online) Vol. 4 No. 4 (2024). https://doi.org/10.35877/454RI.eduline2981.

Fabrigar, L. R., Vaughan-Johnston, T. I., and Wegener, D. T. (2024). Quasi-Experimental Designs. Handbook of Research Methods in Social and Personality Psychology. Cambridge University Press. DOI: https://doi.org/ 10.1017/9781009170123.009.

Feng, T.-T., & Yang, L.-F. (2024). *Sustainable development of the cultural and creative industries in the post-pandemic era: A case study of the animation industry in China. Sustainability, 16*(22), 9796. https://doi.org/10.3390/su16229796

Francisco, C. D. C., & Barcelona, M. C. (2020). Effectiveness of an online classroom for flexible learning. International Journal of Academic Multidisciplinary Research, 4(8), 100–107.

Gubalane, Z. P. L., Arroyo, P. R., & Nilo, J. D. (2021). *Utilization of the Self-Learning Modules (SLMs) as assessed by the master teachers of the Schools Division Office of Muntinlupa City* (Basic Education Research Fund report). Department of Education.

Honculada, S. F. (2024). *Gains and losses of printed modular distance learning: Learners' lived experiences* (phenomenological study, Schools Division report). Tangub City Education Office. Downloaded from https://tangub.deped.gov.ph/wp-content/uploads/2024/09/Gains-and-Losses_Honculada_BERF-2022.pdf? utm_source=chatgpt.com on November 24, 2025.

Junco, M. A., & Nabua, E. (2023). The Academic Performance of Grade-11 Biology on Modular Distance Learning: Basis for Instructional Material Development. International Journal

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
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February 2026
Available online at https://www.instabrightgazette.com

of Science Education and Teaching, 2(2), 87–105. https://doi.org/10.14456/ijset.2023.7.

Joshua, G. (2025). Improving the experimentation skills in science of grade 5 learners through electronic inquiry-based learning kit. International Journal of Research Studies in Education. 2025 Volume 14 Number 15, 59-68. DOI: 10.5861/ijrse.2025.25253.

Jou, Y.-T., Mariñas, K. A., & Saflor, C. S. (2022). *Assessing cognitive factors of modular distance learning of K-12 students amidst the COVID-19 pandemic towards academic achievements and satisfaction. Behavioral Sciences, 12*(7), 200. https://doi.org/10.3390/bs12070200.

Kleftodimos, A. (2024). *Computer-animated videos in education: A comprehensive review and teacher experiences from animation creation. Digital, 4*(3), 613–647. https://doi.org/10.3390/digital4030031.

Lutching, C. (2024). Self-Learning Modules (SLM): Its Effect On The Academic Performance In Mathematics In The New Normal. November 2024. International Journal of Educational Research and Development. https://www.researchgate.net/publication/385785649_SELF-LEARNING_MODULES_SLM_ITS_EFFECT_ON_THE_ACADEMIC_PERFORMANCE_IN_MATHEMATICS_IN_THE_NEW_NORMAL.

Mallari, M. D., & Tayag, J. R. (2022). Situational interest and engagement of public junior high school science students in modular distance learning. International Journal of Instruction, 15(3), 581-598. https://doi. org/10.29333/iji.2022.15332a.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

McLeod, S. (2023). Experimental Method In Psychology. Simply Psychology. Downloaded from https://www. simplypsychology.org/experimental-method.html?utm_source=chatgpt.com on November 25, 2025.

Mokkink, L. B., Eekhout, I., and Boers, M. (2023). Studies on Reliability and Measurement Error of Measurements in Medicine – From Design to Statistics Explained for Medical Researchers. Patient Relat Outcome Meas. 2023 Jul 7; 14:193–212. doi: 10.2147/PROM.S398886. PMCID: PMC10336232. PMID: 37448975.

Mulcahy, S. (2023). *Making and Breaking 'Bad' Habits in Drugs, Law and … Performance Research*, 28(4), 425-433. https://doi.org/10.1080/13528165.2023.2334657.

Natividad, E. (2021). *Perceived effectiveness of self-learning modules in the implementation of modular distance learning in the elementary level.* SSRN. https://doi.org/10.2139/ssrn.3889429.

Nikolopoulou, K. (2023). What Is Purposive Sampling? | Definition & Examples. Scribbr. Downloaded from https://www.scribbr.com/methodology/purposive-sampling/?utm_source=chatgpt.com on November 25, 2025.

Nuffic. (2025). *Primary and secondary education in the Philippines*. Retrieved from https://www.nuffic.nl/en/ education-systems/philippines/primary-and-secondary-education?utm_source=chatgpt.com on November 24, 2025.

Olmsted, J. (2024). Research Reliability and Validity: Why do they matter? American Dental Hygienists' Association December 2024, 98 (6) 53-57. https://jdh.adha.org/content/98/6/53.full?utm_source=chatgpt.com.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

Psychology-Lexicon. (2024). Learner. In Glossary. Retrieved from https://www.psychology-lexicon.com/cms/glossary/45-glossary-l/25797-learner.html on November 24, 2025.

Putra, I. (2021). *The Effect of Using Learning Modules on Student Learning Outcomes.* Global Scientific Journal. Downloaded from https://www.globalscientificjournal.com/researchpaper/EFFECT_OF_MODULAR_LEARNING_APPROACH_ON_THE_ACADEMIC_ACHIEVEMENT_OF_STUDENTS.pdf?utm_source=chatgpt.com on November 25, 2025.

Rodriguez, V. R., Dueñas, Z. D., and Collado, Z. C. (2023). What's wrong with Self-Learning Modules (SLMs)? Examining public school teachers' experiences in modular classes. Sage Journals. Volume 26, Issue 2-3. https:// doi.org/10.1177/13654802251325387.

Roy, A. J. C., & Biscocho, M. M. (2024). *The use of video-based instructional material to improve learning competency of the students in selected topics in biology at Satriwithaya School, Bangkok, Thailand.* Psychology and Education: A Multidisciplinary Journal, 20(8), 1066–1077. https://doi.org/10.5281/zenodo.11637926.

Shao, F., Tang, L., & Zhang, H. (2024). *Video watching and hands-on experiments to learn science: what can each uniquely contribute? Disciplinary and Interdisciplinary Science Education Research*, 6, Article 17. https://doi. org/10.1186/s43031-024-00103-x.

Soqueña, A. C. (2021). "Computer Self-Efficacy, Information Technology (IT) Competency and Teaching Effectiveness of Teachers Among Higher Education Institutions." Turkish Online Journal of Qualitative Inquiry, 12(6), 5582-5600.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

Taghap, R., & Mannan Addani, S. S. (2024). Learners Attitude and Academic Success Towards Science. *Journal of Education Culture and Society*, *15*(2), 511-532. https://doi.org/10.15503/jecs2024.2.511.532.

Tanucan, J. C. M, Alejandro, B. A., and Corcino, R. B. (2023). *Towards an enhanced implementation of printed modular distance learning: A meta-synthesis*. International Journal for Learning, Teaching and Educational Research. Vol 22, No 3 (2023). *https://doi.org/10.26803/ijlter.22.3.21.*

Teplá, M., Teplý, P. & Šmejkal, P. Influence of 3D models and animations on students in natural subjects. *IJ STEM Ed* 9, 65 (2022). https://doi.org/10.1186/s40594-022-00382-8.

The Editors of *Encyclopaedia Britannica*. (2025). *Chemistry*. In *Encyclopaedia Britannica*. Retrieved from https://www.britannica.com/science/chemistry?utm_source=chatgpt.com on November 24, 2025.

The Editors of Encyclopaedia Britannica. (2025). Effect. In Britannica Dictionary. Retrieved from https://www. britannica.com/dictionary/effect?utm_source=chatgpt.com on November 23, 2025.

Tison, A. C., Lachica, R. L., & Bautista, M. A. (2025). *Factors affecting learners' academic performance. International Multidisciplinary Journal of Research for Innovation, Sustainability and Excellence, 2*(6), 380–390. https://doi.org/10.5281/zenodo.15647419.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

Tria, J. Z. (2020). *The COVID-19 pandemic through the lens of education in the Philippines: The new normal. International Journal of Pedagogical Development and Lifelong Learning, 1*(1), ep2001. https://doi.org/ 10.30935/ijpdll/8311.

Umanah, F. I., & Atabang, A. A. (2025). *Effect of animated and static infographic instructional materials on students' academic performance in isomerism in chemistry*. *International Journal of Research and Innovation in Social Science (IJRISS), 9*(03), 1515–1524. https://doi.org/10.47772/IJRISS.2025.903SEDU0118.

Villanueva, et al. (2022). *Assessing the effectiveness of self-learning modules (printed and digital): content and delivery*. Psychology And Education: A Multidisciplinary Journal. Volume: 42. Issue 8. Pages: 1152-1163 Document ID: 2025PEMJ4112 DOI: 10.70838/pemj.420806.

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments, 31*(2), 863–875.

Clark, R. C., & Mayer, R. E. (2021). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (5th ed.). Wiley.

Dhawan, S. (2022). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5–22.

Hattie, J. (2023). *Visible learning: The sequel*. Routledge.

Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Clark, R. C., & Mayer, R. E. (2021). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (5th ed.). Wiley.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). *How to design and evaluate research in education* (10th ed.). McGraw-Hill Education.

Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Van Breukelen, G. J. P. (2024). Cluster randomized trials with a pretest and posttest: Equivalence of three-, two- and one-level analyses, and sample size calculation. *Multivariate Behavioral Research, 59*(2), 206–228. https://doi.org/10.1080/00273171.2023.2240779

Wen, X., Dawod, A. Y., & Yu, X. (2025). Comparing instructional models and predicting academic performance in physics experiments: A quasi-experimental study. *International Journal of Learning, Teaching and Educational Research.* https://www.ijlter.net/index.php/ijlter/article/view/2530

Ngadimin, N., Hamid, A., Sahara, Y., & Musdar, M. (2024). Effectiveness of a scientifically based flipped classroom model to increase students' critical thinking ability. *Asian Journal of Science Education, 6*(1). https://doi.org/10.24815/ajse.v6i1.35574

Nguyen, T. H., et al. (2024). A pre–post quasi-experimental study of team-based learning effectiveness for Vietnamese nursing students. *BMC Medical Education.* https://pmc.ncbi.nlm.nih.gov/articles/PMC12118889/

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

Strategic intervention material and pretest–posttest quasi-experimental design in STEM education. (2025). *Advanced Journal of STEM Education, 2*(1). https://doi.org/10.31098/ajosed.v2i1.2540

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments, 31*(2), 863–875. https://doi.org/10.1080/10494820.2020.1813180

Clark, R. C., & Mayer, R. E. (2021). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (5th ed.). Wiley.

Dhawan, S. (2022). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments, 31*(2), 863–875. https://doi.org/10.1080/10494820.2020.1813180

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2024). Emergency remote teaching in higher education: Mapping the first global online semester. *International Journal of Educational Technology in Higher Education, 21*(1), 1–24. https://doi.org/10.1186/s41239-021-00282-x

Clark, R. C., & Mayer, R. E. (2021). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (5th ed.). Wiley.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
February 2026
Available online at https://www.instabrightgazette.com

****

Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments, 31*(2), 863–875. https://doi.org/10.1080/10494820.2020.1813180

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2024). Emergency remote teaching in higher education: Mapping the first global online semester. *International Journal of Educational Technology in Higher Education, 21*(1), 1–24. https://doi.org/10.1186/s41239-021-00282-x

Clark, R. C., & Mayer, R. E. (2021). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (5th ed.). Wiley.

Dhawan, S. (2022). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments, 31*(2), 863–875. https://doi.org/10.1080/10494820.2020.1813180

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2024). Emergency remote teaching in higher education: Mapping the first global online semester. *International Journal of Educational Technology in Higher Education, 21*(1), 1–24. https://doi.org/10.1186/s41239-021-00282-x

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INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VII, Issue III
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Available online at https://www.instabrightgazette.com

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Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2024). Emergency remote teaching in higher education: Mapping the first global online semester. *International Journal of Educational Technology in Higher Education, 21*(1), 1–24. https://doi.org/10.1186/s41239-021-00282-x

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