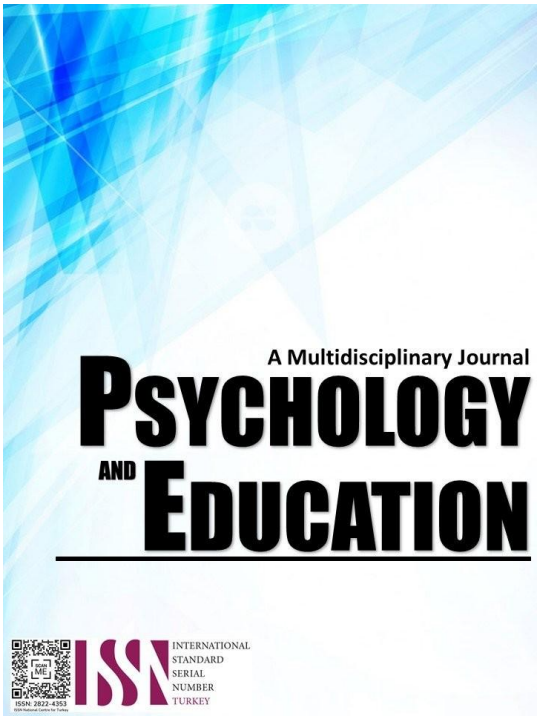
CONTEXTUALIZED LEARNING EXERCISES FOR PHYSICS 9 THROUGH MODULAR APPROACH



PSYCHOLOGY AND EDUCATION: A MULTIDISCIPLINARY JOURNAL

Volume: 50
Issue 2
Pages: 198-206
Document ID:2025PEMJ4854
DOI: 10.70838/pemj.500208
Manuscript Accepted: 11-28-25

Psych Educ, 2025, **50**(2): 198-206, Document ID:2025PEMJ4854, doi:10.70838/pemj.500208, ISSN 2822-4353

Research Article

Contextualized Learning Exercises for Physics 9 Through Modular Approach

Melanie B. Garcia*
For affiliations and correspondence, see the last page.

Abstract

The research assessed the status of the modular approach in teaching the most essential learning competencies (MELCs) in Physics to Grade 9 students at Subangdaku Technical Vocational School of Mandaue City Division during the school year 2020-2021 as a basis for contextualized learning exercises. It used a descriptive-correlational design to determine the relationship between the indicated variables and the status of the modular approach. The data were gathered from 50 randomly selected students and 2 Science teachers and analyzed using percentages, a weighted mean, and the Pearson r correlation coefficient. The status of the modular approach was assessed based on module content, module distribution, retrieval of answer sheets, and students' performance in Physics 9. Results revealed that the modules' content was Highly Observed in the following DepEd standards; the distribution of modules was Very Highly Observed; and the retrieval of the answer sheets was Highly Observed. The performance of the students was Very Much Competent on the competencies, investigating the relationship between the angle of release and the height, and range of the projectile, and relating impulse and momentum to the collision of objects (e.g., vehicular collision), while Not Competent on describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively, most of the students. Furthermore, the top challenges of both the teachers and students encounter in the implementation of the modular approach were over-congested activities found in Physics 9 modules, the low performance of the learners due to the limited input of the teachers, learners' late answer sheets due to the level of difficulty of the activities found in the modules, parents' capacity to tutor the students, and teachers' accessibility to the internet. Thus, this research recommends the attached contextualized learning exercises from the PHET simulation to deepen students' understanding of the competencies of Physics 9, especially during the pandemic.

Keywords: *teaching physics, contextualized learning exercises, PHET simulation, modular approach, Mandaue City, Cebu*

Introduction

The COVID-19 pandemic brought many challenges to the educational system, not just in the Philippines but also in other countries around the world. About 1.5 billion learners worldwide have been severely disrupted in their education (UN, 2020). Students who were at a disadvantage in terms of their ability to access the internet and use appropriate specs for gadgets have been the worst hit by the situation. About 830 million students worldwide do not have access to a computer (Ibid). In some countries, most classes were conducted synchronously through their chosen virtual platforms, enabling widespread technology use and positively impacting teachers, who have opportunities to upskill in the virtual forum (Chadwick and Mcloughlin, 2020). In the Philippines, ensuring the welfare of more than 27 million learners in Basic Education was achieved through the adoption of the Basic Education Learning Continuity Plan (D.O. no. 12, s. 2020). According to UNESCO (2017), "Education cannot wait. If learning stops, we lose human capital".

The Department of Education ensures continuity of learning despite the challenges brought by COVID-19. The Basic Education Learning Continuity Plan emphasized the guidelines for using the Most Essential Learning Competencies (MELCs) nationwide for 2020-2021. These MELCs enable the Department to focus on the most essential competencies learners must be equipped with during these educational crises (DepEd, 2020). It was also emphasized in DepEd's plan that parents will choose their preferred learning modality to deliver the MELCs following it. Since modular distance learning was the most preferred learning modality among parents in Mandaue City Division, selected teachers were tasked with developing modules, with their choice of topic anchored in the MELCs. Given the short span and the lack of well-trained writers, the modules contained inappropriate activities for other learners.

Science education was also significantly affected by this modular distance learning modality, as teachers will not be able to conduct laboratory activities essential to students' competencies. The majority of the science teachers reported students' struggles to learn through remote, online, and blended platforms and even considered these platforms not conducive to learning (Sparks, 2021). The sudden shift in learning modality made the Physics subject more difficult for learners to understand, especially grade 9 students, as it requires mathematical concepts. The supervision of guardians/parents is not sufficient for them to acquire the necessary competencies.

Before the COVID-19 crisis in education, the country already had low scores in science subjects in the 2019 Program for International Student Assessment (PISA) results. The country ranked second-lowest in the subject among 79 participating countries. It alarmed and challenged Basic Education to implement its quality-teaching-and-learning initiatives in Science subjects. Furthermore, Rabino (2014) added that the National Achievement Tests (NAT) consistently showed that science remains the most challenging field of study in Philippine Basic Education. According to Garcia (2020), among the topics that students have difficulty with in grade 9 physics were Forces, Motion, and Energy. When only modules developed by the teachers are the only materials learners use to study Physics 9,

learners may not master the Most Essential Learning Competencies (MELCs).

Subangdaku Technical Vocational School used the Technical-Vocational (Tech-Voc.) Curriculum where most learners enrolled are inclined toward Tech. Voc. Skills. Major subjects such as Science can be genuinely challenging for them, especially now that the teachers have less input due to the selected learning modality. The majority of them have no access to the internet or a device for research, leading to poor study habits or even poor performance in Physics. Thus, this research aimed to evaluate the status of the modular approach in teaching the MELCs in Physics to grade 9 students of Subangdaku Technical Vocational School during the school year 2020-2021 as a basis for contextualized learning exercises. The results of the research will help Physics teachers access simplified learning materials that can increase learners' performance in the subject.

Research Questions

This research assessed the status of the modular approach in teaching the most essential learning competencies (MELCs) in Physics to Grade 9 students at Subangdaku Technical Vocational School of Mandaue City Division during the school year 2020-2021 as a basis for contextualized learning exercises. Specifically, it sought to answer these questions:

1. What is the profile of the students as to:
   1.1 age and gender, and
   1.2 previous physics grades?
2. Using the modular approach, what is the performance of the students in the following competencies:
   2.1 describing uniform accelerated motion (UAM) qualitatively and quantitatively;
   2.2 investigating the relationship between the angle of release and the height and range of the projectile; and
   2.3 relating impulse and momentum to the collision of objects?
3. As perceived by the respondent groups, what is the status of the modular approach as to the following:
   3.1 content;
   3.2 delivery; and
   3.3 retrieval?
4. Is there a significant relationship between the status of the modular approach to the students' performance on the indicated competencies?
5. What are the challenges in implementing the modular approach in teaching the MELCs in Physics?
6. Based on the findings, what contextualized learning exercises can be developed?

Methodology

This section summarizes the method and design used, the study's flow, the research locale, the research respondents, the research instruments, the data collection procedure, the statistical treatments of the data, the scoring procedure, and the definition of terms.

Research Design

This research employed a descriptive-correlational design to assess the relationship among variables to determine the status of the modular approach in teaching the most essential learning competencies (MELCs) in Physics to Grade 9 students at Subangdaku Technical Vocational School of Mandaue City Division during the school year 2020-2021. Moreover, it is quantitative, where the data needed were in numeric form. In addition, appropriate statistical tools were applied to yield accurate results, which the study aims to achieve.

Respondents

The research respondents were the 50 randomly selected Grade 9 students, equally divided between the two (2) sections of Subangdaku Technical Vocational School, Mandaue City Division.

Below is the summary of the respondents' Data.

Table 1. *Frequency Distribution of Respondents*

Respondents	*Subangdaku Tech. Voc. School*	*%*
Section A	25	50
Section B	25	50
Total	50	100

Instrument

This research used a validated instrument derived from the Department of Education's guidelines for implementing the modular learning delivery approach. It used a 4-point Likert Scale to assess the status of the modular learning delivery approach across content, delivery, and retrieval. Furthermore, the research also used the 10-item posttest for each indicated competency from the Grade 9 quarter 4 module of the Mandaue City Division to assess students' performance.

Procedure

The researcher sought the approval of the School Principal of Subangdaku Technical Vocational School for the smooth conduct of the study. Moreover, the parents' consent was sent to the respondents' parents/guardians to ask for their permission to involve their son/daughter in this research.

The respondents were informed in detail about their full participation in the study and that ethical measures were always observed due to their status as minors. Questionnaires were sent during the distribution/ retrieval of the answer sheets. Health protocols were followed in the entire process.

Data were collected and analyzed using appropriate statistical tools, including frequency counts, weighted means, and Pearson's r correlation coefficient. Moreover, the research output, the contextualized learning materials in Physics, was then developed.

A final draft was submitted for finalization and corrections.

Data Analysis

The following statistical tools were used to analyze and interpret the data collected from the respondents.

Percentage. The percentage was used to provide a breakdown of respondents' profiles for both teachers and learners.

Weighted Mean. The weighted mean was used to determine the status of the modular approach as to the content, delivery, and retrieval.

Pearson r Correlation Coefficient. It was used to determine the significant relationship between the status of a modular approach and students' performance in the indicated competencies.

Scoring Procedure

The following are the scoring guides of this research.

The scoring guide for assessing the modular approach in terms of content, module distribution, and retrieval is described below.

Table 2. *Scoring Guide*

Weight	*Scale*	*Category*	*Verbal Description*
4	3.25-4.00	Very Highly Observed (VHO)	All the indicators were Very Highly observed during the modular approach.
3	2.50-3.24	Highly Observed (HO)	Almost all the indicators were observed during the modular approach.
2	1.75-2.49	Less Observed (LO)	Only a few of the indicators were observed during the modular approach.
1	1.00-1.74	Not Observed (NO)	None of the indicators were observed during the implementation of the modular approach.

The students' performance in Physics 9 was guided by the scoring below.

Table 3. *Performance of the Students in Physics 9 Scoring*

Score	*Category*	*Verbal Description*
9-10	Very Much Competent (VMC)	The students got an Outstanding performance of 90-100%
8	Very Competent (VC)	The students got a Very Satisfactory performance of 80%
7	Competent	The students got a Satisfactory performance of 70%
6-Below	Not Competent	The students did not meet the expectations with a performance of 60% and below

Source:D.O.31, s. 2020

Results and Discussion

This section presents, analyzes, and interprets the data gathered from the respondents' questionnaire at Subangdaku Technical Vocational School, Mandaue City Division. The findings have been tabulated, analyzed, interpreted statistically, and described textually.

Profile Of The Respondents

This part presents discussions of the students' profiles, including age, gender, and previous physics grades.

Students' Profile

Age. One of the students' profiles needed in the study is their age. The Table below shows that five (5) or 10% of the student respondents were above 17 years old, three (3) or 6% were 17 years old, and 42 or 84% were 16 years old and above.

Table 4. *Age*

Age	*(F)*	*%*
Above 17 years old	5	10
17 years old	3	6
16 years old	42	84
Total	50	100

The results imply that most of the student respondents in the study were 16 years old, which made them appropriate for the study.

Gender. Table 3 summarizes the gender data of the student respondents. It revealed that 20% or 40% of the respondents were males, while 30% or 60% were females.

Table 5. *Gender*

Gender	*(F)*	*%*
Male	20	40
Female	30	60
Total	50	100

The above data indicate that most student respondents were female.

Previous Physics Grades. Data on the students' previous Physics Grades were also needed for this research to compare current performance. From the results, 10 or 20% of the students had 90 and above, nine (9) or 18% had 85-89, 23 or 46% had 80-84, while eight (8) or 16% of the respondents had 75-79 previous grades in Physics.

Table 6. *Previous Physics Grades*

Grade Range	*(F)*	*%*
90 and above	10	20
85-89	9	18
80-84	23	46
75-79	8	16
Total	50	100

It indicates that most learners had 80-84 in their previous Physics grades, indicating they had Satisfactory grades in the subject.

Performance Of The Students In The Indicated Competencies

This part describes the students' performance in the three competencies of Physics: describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively; investigating the relationship between the angle of release and the height and range of a projectile; and relating impulse and momentum to the collision of objects. These are among the most essential competencies students need to master the subject. It was noted that these would be delivered through a modular distance-learning approach, with teachers' input limited since students do not have access to the internet.

Describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively

In this essential learning competency in Physics 9, students solve the uniform acceleration motion problems and describe the motion qualitatively and quantitatively. Illustrations and examples are provided; then, students complete the activities on the corresponding pages and submit them during the retrieval schedule.

Table 7. *Students' Performance on Describing Uniform Accelerated Motion (UAM) Qualitatively and Quantitatively*

Score Interval	*Frequency*	*%*	*Interpretation*
9-10	13	26	Very Much Competent (VMC)
8	12	24	Very Competent (VC)
7	6	12	Competent
6-Below	19	38	Not Competent
Total	50	100	

Legend: 9–10 (Very Much Competent – VMC), 8 (Very Competent – VC), 7 (Competent), 6 and below (Not Competent).

Aside from the provided activities, a posttest was administered at the end of the module to assess students' learning on the indicated topics. Data revealed that in the posttest of the competency, describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively, 16 or 26% of the students were Very Much Competent on it with scores ranging from 9-10, 12 or 24% were Very Competent (VC), six (6) or 12% were Competent, 19 or 38% of them were Not Competent in describing the uniformly acceleration motion according to qualitative and quantitative descriptions. Accelerated motion is complicated for students because an object can change its speed, direction, or both (Victoria State Government, 2019). Using the modules alone without simplifying the activities might be difficult for them to understand.

Investigating the relationship between the angle of release and the height and range of the projectile.

In this essential learning competency, the module highlights the concepts of projectiles, especially their two types: horizontally launched projectiles and projectiles launched at an angle. The module described the two and illustrated the concepts well; however, most examples are not sufficiently contextualized to help clarify them.

From the Table below, 25 or 50% of the students were Very Much Competent in answering the posttest with scores ranging from 9-10 on the indicated competency, 16 or 32% were Very Competent with a score of 8, four (4) or 8% were Competent with a score of 7

Table 8. *Students' Performance on Investigating the Relationship Between the Angle of Release and the Height and Range of the Projectile*

Score Interval	*Frequency*	*%*	*Interpretation*
9-10	25	50	Very Much Competent (VMC)
8	16	32	Very Competent (VC)
7	4	8	Competent
6-Below	5	10	Not Competent
Total	50	100	

In comparison, the remaining five students (10%) were Not Competent, with scores of 6 or below out of 10 items. This implies that students are still having difficulty with the competency and that the exercises in the modules need to be further simplified. Topics in projectile motion are complicated for students to understand, especially in this modular learning approach. According to Garcia (2020), the many reactions to the application of formulas and calculations that hinder understanding of the projectile lead to traditional routines and meaningless computational activities, bring additional mathematical struggles, and have to be considered.

Relating impulse and momentum to the collision of objects (e.g., vehicular collision)

In this competency, the students are expected to learn about the property of moving things, called momentum, and its changes, referred to as impulse. There are also illustrations and examples of the module's concepts, but students still struggle to understand them because they are presented only through a modular approach. The Table below shows the posttest results for students on impulse and momentum.

Table 9. *Students' Performance on Relating Impulse and momentum to Collision of objects (e.g., vehicular collision).*

Score Interval	*Frequency*	*%*	*Interpretation*
9-10	24	48	Very Much Competent (VMC)
8	17	34	Very Competent (VC)
7	1	2	Competent
6-Below	8	16	Not Competent
Total	50	100	

Data revealed that 24 or 48% of the student respondents got a score of 9-10 implying Very Much Competent on the competency, 17 or 34% got a score of 8, which has a Very Competent description on the competency, one (1) or 2% got a score of 7 which signifies Competent, while eight (3) or 16% got a Not Competent score of 6 and below interval.

Despite the module's goal of helping students understand the concepts, some students did not meet the competency, suggesting they need intervention to understand them. The reasons were more on the Mathematical side of the topic, which is the language of physics. According to Saifullah et al.'s (2017) study on students' difficulties with Impulse and Momentum, students understood that momentum is a vector quantity equal to the product of an object's mass and its speed. Nevertheless, the students found it challenging to determine the change in momentum when the object changed its motion.

Status Of the Modular Approach

This part summarizes the respondents' perceptions of the modular approach regarding module content, module distribution, and the retrieval of answer sheets.

Content

The teachers of the division above locally craft the modules used during modular distance learning since the nationally developed ones had not been completed by the time they were needed. With this, the students assessed the modules' content using the Learning Resources Management and Development System (LRMDS) tool.

From the Table, it shows the student responses got a highest mean of 3.12 on "the module includes useful presentations, reviews, summaries, and other devices that facilitate smooth progression from one lesson to another" implying Highly Observed and a lowest mean of 2.90 on "motivational strategies (e.g., overviews, advance organizers, puzzles, games, etc.) are provided which signifies Highly Observed. The overall mean of 3.02 on the students' responses implies that the students Highly Observed the items about the quality of the module's content.

Despite the results, there is still a need to improve the modules' content so students can fully understand the competencies. Given the subject's difficulty level compared to other branches of science, the exercises in the modules must be simplified, especially since they require Mathematical skills in computing the unknown variables. This was also the same finding in the study by Alonzo and Mistades (2021): the primary difficulty in students' learning of physics is its mathematical aspects in problem-solving.

They also mentioned that the students generally have difficulties understanding word problems, which contributes to their low performance in the indicated topics.

Table 10. *Content of the Modules*

Items	*Students χw*	*V.D.*
The module contributes to the achievement of specific objectives of the learning area and grade level for which it is intended.	3.1	HO
Sequencing of topics and exercises within each lesson facilitates achievement of objectives	3.02	HO
Contents are suitable to the target learner's level of development, needs, and experience	3.06	HO
Contents reinforce, enrich, and / or lead to the mastery of the targeted learning competencies intended for the learning area and grade level.	3.02	HO
Contents are logically advanced and organized through the material. (Lessons/activities are organized from simple to complex, from observable to abstract).	2.90	HO
The module contains useful introductions, reviews, summaries, and other devices that facilitate smooth progression from one lesson to another.	3.12	HO
Development of lessons lets for review, comparison, and integration with previous lessons.	3.08	HO
Motivational approaches (e.g., overviews,advance organizers, puzzles, games, etc.) are provided.	2.90	HO
The module uses various teaching and learning strategies to meet individual differences/ learning styles. (if applicable)	2.96	HO
The module develops higher cognitive skills (e.g., critical thinking skills, creativity, learning by doing, problem solving) and 21st century skills. "	3.06	HO
Overall Weighted Mean	3.02	HO

Legend: 3.26–4.00 (Very Highly Observed – VHO), 2.51–3.25 (Highly Observed – HO), 1.76–2.50 (Less Observed – LO), 1.00–1.75 (Not Observed – NO).

Distribution of Modules

Another way to assess the use of the modular approach in teaching and learning Physics is to examine the distribution of modules. DepEd provided guidelines on how the modules enable the students to implement the modular distance learning modality. The respective Divisions provided a schedule of the distribution of modules and retrieval of answer sheets. The modules are delivered to the students by the parents on the scheduled date. Table 9 describes how the indicated school did the modules. Since the respondents are Grade 9 students, the Local Government Unit provided tablets for those willing to borrow, while those who weren't were given links to access the modules. Among the highlighted procedure of accessing the modules are the students who have access to their weekly modules, the students have updated weekly copies of modules, the students need to the internet connection to access the modules, the parents are aware of the weekly modules for the students to answer, and when can't access, the teachers send soft copies or print hard copies.

Table 11. *Distribution of Modules*

Items	*Students χw*	*V.D.*
The students have access to their weekly modules.	2.26	HO
The students have updated weekly copies of modules.	3.12	HO
The students need the internet connection to access the modules.	3.12	HO
The parents are aware of the weekly modules for the students to answer.	3.22	HO
When can't access, teachers' will send soft copies of print hard copies.	3.00	HO
Overall Weighted Mean	2.94	HO

Based on the results, the indicator with the highest mean, 3.22, was "the students need an internet connection to access the modules," which implies it was Highly Observed. Meanwhile, the lowest mean of 2.26 on "the students have access to their weekly modules" was still Highly Observed by them. The Overall Data for the student respondents had a mean of 2.94, indicating that the students Highly Observed the indicators enumerated in the distribution of modules. These indicators served as the weekly routines of both teachers and students. Despite the schools' efforts, various challenges were encountered, particularly in the distribution of modules, including a lack of printed modules (Melorin, 2021).

Retrieval of Answer Sheets

Another essential component of implementing the modular approach in teaching and learning is retrieving the answer sheets, which were collected a week after the module was distributed to students. The Data about the student responses had the highest mean of 3.04 on "the students who submitted complete summative-based assessments in the quarter", which implies Highly Observed, while the lowest mean of 2.94 was on "the students who submitted performance-based comprehensive evaluations in the quarter". "The students submitted complete answers to the activities from the modules, which entails Highly Observed also. The overall student response data had a mean of 3.00, indicating that they Highly Observed the item. However, there is still room to improve its implementation, as the results are not optimal. Thus, to implement the modular approach best, the retrieval of the answer sheet guidelines must be maximized.

Despite constant monitoring of teachers during answer sheet retrieval, various challenges arise each week, including the majority of parents failing to follow their assigned schedule (Melorin, 2021). To ensure a 100% retrieval rate of answer sheets, the indicators emphasized in DepEd's guidelines must be observed; otherwise, students' performance might be at stake.

Table 12. *Retrieval of Answer Sheets*

Items	*Students χw*	*V.D.*
The students submitted answer sheets on time.	2.98	HO
The students submitted lacking answers in some activities	3.1	HO
The students submitted complete summative-based assessments in the quarter.	3.04	HO
The students submitted complete performance-based assessments in the quarter.	2.94	HO
The students submitted complete answers of the activities from the modules.	2.94	HO
Overall Weighted Mean	3.00	HO

Relationship Between Students' Performance and the Implementation of the Modular Approach

This part summarizes the relationship between the students' performance in the indicated competencies in Physics. Moreover, in this section, the significant results were elaborated. Since the implementation of the modular approach in this research focused on the content, distribution of modules, and retrieval of answer sheets, three respective Tables summarize the results of each modular approach implementation factor and the indicated Physics 9 competencies.

Table 13. *Relationship Between Performance of the Respondents and the Status of the Modular Approach as to Content*

Content	*Pearson (r) Correlation*	*N*	*Significant (2-Tailed) value*	*Significant*	*Result*
Describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively	.829	4	.171	Not Significant	Failed to Reject Ho
Investigating the relationship between the angle of release and the height and range of the projectile	.214	4	.786	Not Significant	Failed to Reject Ho
relating impulse and momentum to collision of objects (e.g., vehicular collision)	.451	4	.549	Not Significant	Failed to Reject Ho

**significant when p-value<.05*

Table 13 shows if there is a significant relationship between the students' performance and the content of the modules. From the data above, it was revealed that the modules' content has no significant relationship with the three indicated competencies, implying that it has nothing to do with the low or high performance of the stated sample in this research.

This further entails that the content, as evaluated by both teachers and students, has nothing to do with their performance in the subject. The reasons may be that the gravity of the modules' activities varies. The students can't really tell from the tool how it relates to the exercises they have to deal with in the modules.

In the study of Dargo and Dimas (2021) on Modular Distance Learning: Its Effect on the Academic Performance of Learners in the New Normal, they concluded that the academic performance of learners after the implementation of Modular Distance Learning (MDL) decreased, and that there are too many tasks/ activities incorporated in the modules.

Table 14. *Relationship Between Performance of the Respondents and the Status of the Modular Approach as to the Distribution of Modules*

Content	*Pearson (r) Correlation*	*N*	*Significant (2-Tailed) value*	*Significant*	*Result*
Describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively	.485	4	.515	Not Significant	Failed to Reject Ho
investigating the relationship between the angle of release and the height and range of the projectile	-.542	4	.458	Not Significant	Failed to Reject Ho
relating impulse and momentum to collision of objects (e.g., vehicular collision)	-.339	4	.661	Not Significant	Failed to Reject Ho

**significant when p-value<.05*

Table 14 shows the relationship between students' performance and the status of the modular approach, as reflected in module distribution. Results revealed that students' performance in the three indicated competencies is not significant, and the Distribution of Modules also failed to reject the null hypothesis. Thus, the protocol for distributing modules has no significant effect on their performance across the three indicated competencies.

This further implies that students can find a way whenever they don't have copies of their modules. They can message the teachers or ask their classmates.

Meanwhile, Table 15 shows the results of testing the significant relationship between performance and module retrieval, which is also a highlight of the modular approach's implementation. Data revealed that the retrieval of answer sheets was not significantly related to the first competency in Physics 9, describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively.

Table 15. *Relationship Between Performance of the Respondents and the Status of the Modular Approach as to the Retrieval of Answer Sheets*

Retrieval of Answer sheets	*Pearson (r) Correlation*	*N*	*Significant (2-Tailed) value*	*Significant*	*Result*
Describing Uniform Accelerated Motion (UAM) qualitatively and quantitatively	.-.020	4	.980	Not Significant	Failed to Reject Ho
Investigating the relationship between the angle of release and the height and range of the projectile	-.246	4	.756	Not Significant	Failed to Reject Ho
relating impulse and momentum to collision of objects (e.g., vehicular collision)	-.329	4	.671	Not Significant	Failed to Reject Ho

In addition, the remaining two indicated competencies were also Not Significant. It further implies that the status of the modular approach is unrelated to students' performance in the indicated competencies. In a modular learning delivery approach, students are given the opportunity to work through their modules at their own pace. Even if they submit on the next day or week, the teachers still accept their answer sheets without deducting points.

Challenges/ Barriers In The Implementation Of The Modular Approach

This section summarizes the gravity of the challenges and barriers respondents faced during the implementation of the modular approach. The challenges were ranked according to respondents' responses.

Table 16. *Challenges in the Modular Approach Implementation*

Challenges/Barriers	*Rank*
Over-congested activities found in Physics 9 modules	1
Low performance of the learners due to the limited input of the teachers.	2
Learners' late answer sheets due to the level of difficulty of the activities found in the modules.	3
Parents' capacity to tutor the students.	4
Teachers' accessibility in the internet connectivity.	5

Table 16 shows the top 5 challenges/barriers the respondents faced during the implementation of the modular approach. First in the rank were the Over-congested activities found in Physics 9 modules. Second was the learners' low performance due to the limited input from the teachers; third was learners' late submission of answer sheets due to the difficulty of the activities in the modules; fourth was parents' capacity to tutor students; and last was the teachers' access to the internet.

These results further imply that, with the many challenges/barriers in the educational system now due to COVID-19, students have a hard time learning Physics concepts, as shown in Table 20. Thus, teachers must find ways to simplify the activities and reach out to students for input, since the subject requires information to confirm how to do the exercises. This was also the same with the findings of Dargo and Dimas (2021) research on the effect of modular distance learning on the performance of the learners, that the administration should concentrate on improving and simplifying worksheets or workbooks to be distributed to learners, accompanied by video lessons that are aligned with the Most Essential Learning Competencies (MELC).

Conclusions

This section elaborates on the summary of findings, conclusion, and recommendations of the study.

This research assessed the status of the modular approach in teaching the most essential learning competencies (MELCs) in Physics to Grade 9 students at Subangdaku Technical Vocational School in the Mandaue City Division during the school year 2020-2021, as a basis for contextualized learning exercises. It is then concluded that there is a need for contextualized learning exercises, as the prior results revealed that not all students were Very Competent in the indicated most essential learning competencies.

The research then recommends that teachers use contextualized learning exercises to help students become competent in the indicated competencies and to address the challenges and barriers of the modular learning delivery approach. Furthermore, future researchers may validate the effectiveness of the exercises to ensure learning occurs primarily during the pandemic.

References

Alonzo, S. and Mistades, V. (2021). Students' conceptual understanding and problem-solving of the Work-Energy and Impulse-Momentum Theorems in a flipped classroom. Journal of Physics: Conference Series. 1882. 012003. 10.1088/1742-6596/1882/1/012003.

Auer, M.; Tsiatsos, T. (2019). The Challenges of the Digital Transformation in Education: Proceedings of the 21st International Conference on Interactive Collaborative Learning (ICL2018). Cham: Springer. p. 178. ISBN 978-3-030-11931-7.

Chadwick, Ruth & Mcloughlin, Eilish. (2020). Impact of the COVID-19 crisis on science teaching and facilitation of practical activities. 10.35542/osf.io/vzufk.

Cherry, K. (2020). The Experiential Learning Theory of David Kolb. Retrieved from https://www.verywellmind.com

Dargo, M, and Dimas, M. (2021). Modular Distance Learning: Its Effect on the Academic

Department of Education. (2020). Adoption of the Basic Education Learning Continuity Plan for School Year 2020-2021 In Light Of The COVID-19 Public Health Emergency. Retrieved from www.deped.gov.ph

Garcia, M. (2020). Salmon's E-tivity Approach in Teaching Mathematical Concepts in Physics. CNU Journal of Higher Education (14) 7-26. Retrieved from www.cnujournal.com

InstructionalDesign.Org. (n.d.). Constructivist Theory (Jerome Bruner). Retrieved from https://www.instructionaldesign.org/theories/constructivist/

Jaiswal, R. (2017). Philosophy of Progressivism. Retrieved from https://www.slideshare.net/ruchi263/philosophy-of-progressivism

Kolb, D. A. Experiential Learning: Experience as the Source of Learning and Development. New Jersey: Prentice-Hall; 1984.

Melorin, M. (2021). MODULE DISTRIBUTION AND RETRIEVAL: A CHALLENGE. Retrieved from https://www.depedsanjuancity.ph/single-post/module-distribution-and-retrieval-a-challenge

Official Gazette. (2013). The Official Gazette is the official journal of the Republic of the Philippines. Edited at the Office of the President of the Philippines Under Commonwealth Act No. 638. Retrieved from https://www.officialgazette.gov.ph/

Performance of Learners in the New Normal. Retrieved from https://www.researchgate.net/publication/356436791_Modular_Distance_Learning_Its_Effect_in_the_Academic_Performance_of_Learners_in_the_New_Normal

Saifullah, A. & Sutopo, Sutopo, & Wisodo, H. (2017). Senior high school students' difficulties in solving impulse and momentum problems. Jurnal Pendidikan IPA Indonesia. 6. 1-10. 10.15294/jpii.v6i1.9593.

Samala, H. (2017). Spiral Progression Approach in Teaching Science: A Case Study. Retrieved from https://knepublishing.com

Sani, M. (2017). The Contributions Of Jerome Bruner's Constructivist Approach To Education. Retrieved from https://www.worldwidejournals.com/

Sparks, S. (2021). Science Teaching and Learning Found to Decline During the Pandemic. Retrieved from https://www.edweek.org/teaching-learning/science-teaching-and- learning-found-to-fall-off-in-pandemic/2021/04

Sternberg RJ, Zhang L-fang. Perspectives on Thinking, Learning, and Cognitive Styles. Florence: Taylor and Francis; 2014.

United Nations. (2020). The virus that shut down the world: Education in crisis. Retrieved from https://news.un.org/en/story/2020/12/1080732

Victoria State Government. (2019). Newton's Understanding of Forces and Motion. Retrieved from https://www.education.vic.gov.au/school/teachers/teachingresources/discipline/science/continuum/Pages/newton.aspx

Affiliations and Corresponding Information

Melanie B. Garcia
Wallace Rose Hill High School – USA