DESIGN AND EVALUATION OF A MODULE IN CLIMATE CHANGE AND DISASTER RISK MANAGEMENT (CCDRM)

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ABSTRACT

The effectiveness of their teaching strategies has always been a concern for every professional teacher. Teaching strategies include students in every step of the learning process and encourage them to study. For this study, frequency (f), percentage (%), mean (M), standard deviation (SD) and mixed factorial analysis of variance (MANOVA) were used. The intervention was given to the treatment group which was the synchronous learning modality, while the control group was represented by the asynchronous /self-regulated learning modality from 100 students of Isabela State University – Jones Campus under the new normal condition. The research instrument was developed for "Design and Evaluation of a Module in Climate Change and Disaster Risk Management (CCDRM)". It is revealed that the overall results on the teachers' and student evaluation of the CCDRM learning module show relatively high using the set indicators. During the pre-test, there was a higher proportion of students with moderate performance for asynchronous classes and less students with low performance compared to those who would undergo synchronous classes and during the post-test, there was a higher proportion of students with moderate performance for asynchronous classes and less students with low performance compared to those who underwent synchronous classes. As to the student's performance, there was no statistically significant difference in the scores for synchronous and asynchronous classes. In order to teach university students about climate change and disaster risk management, it is advised that this research demonstrated the effectiveness of both the asynchronous and synchronous strategies.

Keywords: Asynchronous, Synchronous, Climate Change and Disaster Risk Management, Teaching Strategies

INTRODUCTION

Every professional teacher has always been concerned with the efficiency of their class delivery methods. Teaching methods motivate students to study and include them in each stage of the instructional process. However, the academic world raced into teaching practices that would make learning successful in the so-called "learning in the new normal" when the pandemic broke out around the end of the year 2019 and lockdowns were introduced beginning in March 2020. Under the new normal, DepEd and CHED both worked to give instructors the knowledge and abilities necessary to conduct teaching using a "blended learning approach," such as the usage of modules or online learning using various computer programs.

Practically all spheres of activity have been affected by COVID-19 but teaching and learning have had a particularly significant influence. According to Hodges, Moore, Lockee, Trust, and Bond (2020) and Smalley (2020), higher education institutions' responses to the pandemic.

Meanwhile, Magsambol B. (2020) claims that DepEd uses the blended learning strategy for distant learning. The transition to online education

and modular learning is due to distance learning, which involves delivering classes outside of the conventional face-to-face setting. As learning facilitators, the instructors in this situation had more work to do and duties to fulfill toward both the learners and their parents and guardians (Kraft and Simon 2020). To prepare the activities and materials that the students would require, teachers must spend twice as much time (Hargreaves, Punzalan, and Kim, 2020). Additionally, the students must have internet-connected devices including laptops, PCs, tablets, and cellphones for use online.

Llego (2020), Bryan & Volchenkova (2016) stated that modular distance learning is in the form of individualized instruction that permits students to use self-learning modules (SLMs) in print or digital format/electronic copy and other learning resources like Learner's Materials, textbooks, activity sheets, study guides, and other study materials. Online learning environments may be categorized into three categories: synchronous, asynchronous, and hybrid, according to Perveen (2015) and Matthew (2021).

The virtual lesson gives students the chance to develop their independence as learners by utilizing cutting-edge, effective, instructive, and efficient online learning resources. The abrupt shift in how learning is delivered has an impact on students' attitudes toward learning, which presents a problem to the educational system (Wan & Mat Ali, 2018; Türkoglu, 2019).

According to Dangle et al., 2020 this epidemic has cleared the way for the adoption of modular distance learning as a hasty measure to guarantee educational continuity. Most countries have temporarily shut down educational facilities throughout the world to stop the virus' spread and lower infections (Tria, 2020; Karalis, 2020; Toquero, 2020). The Philippines is now in the process of adjusting to the new normal form of education, and the success of this transition is being driven by educators' ongoing innovations as well as the active involvement of other stakeholders. Teachers are essential in making sure that high-quality instruction is provided throughout the epidemic.

Learning materials are therefore more efficient in teaching-learning techniques as compared to conventional teaching approaches since they let students study at their speed. The students are stimulated, and their interest is increased by the unconstrained self-learning method, which provides immediate reinforcement and comments for practice exercises (Ambayon, 2020).

In this research, teaching students how to avoid or deal with academic challenges during the pandemic is the main objective of the learning modules. Learning modules thus offered guidance on studying techniques that assisted pupils in better preparing for academic difficulties. This study focuses on designing and evaluating a Climate Change and Disaster Risk Management (CCDRM) module to help students and instructors who are having trouble adjusting to this new teaching style.

OBJECTIVES OF THE STUDY

This study aimed to:

1. Evaluate the CCDRM module based on the following criteria: (a) content, (b) design, features, and presentation, (c) organization, and (d) assessment tools.
2. Evaluate the CCDRM module based on the following stimulated characteristics from students: (a) communicator, (b) inquiry-focused and knowledgeable, (c) competent, (d) collaborative, (e) lifelong learner.
3. Determine the level of effectiveness of the module on the learning of students based on the student's performance scores.
4. Compare the pre-and post-test scores of the students across synchronous and asynchronous learning deliveries.

METHODOLOGY

Both qualitative and quantitative methods were used for this investigation. The descriptive-evaluative design was employed to assess the module. Additionally, the pretest-posttest comparable group design employed a quasi-experimental approach. The treatment and control

groups are included in this design. The synchronous learning modality, which served as the treatment group, received the intervention, whilst the asynchronous/self-regulated learning modality served as the control group. A post-test was then given to the student to evaluate how well they had performed because of the experiment. The post-test results after the exposure are examined to determine the course's values to create a performance comparison. Therefore, the descriptive-comparative design is also used in this study.

The study was conducted at Isabela State University – Jones Campus under the new normal condition. The sample of this study was collected from one hundred (100) students under the supervision of the researcher and course professor enrolled this second semester, S.Y. 2021-2022 of ISU, Jones Campus.

Three (3) sets of questionnaires were used. The student questionnaire will be adopted and modified from the study of Peter Willmot & Glynis Perkin (2011) entitled "Evaluating the Effectiveness of a First-Year Module Designed to Improve Student Engagement", employing a 5-point Likert scale as follows: 1-Strongly Disagree, 2-Disagree, 3- Neutral 4-Agree, 5-Strongly Agree to rate the said questionnaire. Teacher Questionnaire which is composed of the the demographic profile of the respondents and the evaluation of the Learning Module which contains the content, design, features, presentation, organization, and assessment tools. It will be adopted and modified from the ISU Instructional Material Evaluation tool. A 5-point Likert scale with 1-Strongly Disagree, 2-Disagree, 3- Neutral 4-Agree, and 5-Strongly Agree to rate the said questionnaire. The instrument was pilot-tested using the Cronbach Alpha or Coefficient Alpha to determine the reliability and validity of the instrument. The respondents for the reliability and validity tests of the questionnaire were the five (5) pools of Science Professors/experts from Isabela State University. On the other hand, the respondents for the Learner's questionnaire were randomly selected. CCDRM Pre-test and Post-test was a multiple-type of test on CCDRM. This will measure the student's performance in CCDRM. The effectiveness of the CCDRM learning module is based on the students' performance scores on the test items that are based on critical thinking ability; Social Responsibility; Decision Making; Cultural Differences; and Digital Literacy.

The researchers sought permission from the School Administrator of Isabela State University the conduct the study. Since all the educational institutions are still closed due to the outbreak of COVID-19, therefore, an online version of the research instrument using Google Forms will be used for easy gathering of data.

All data were imported and analyzed in Microsoft Excel and IBM SPSS Statistics (version 26). All inferential statistics, unless explicitly stated otherwise, assumed an alpha level of .05. Probability (p) values below this level are significant. For the first, second, and third objectives, frequency (f), percentage (%), mean (M), and standard deviation (SD) were used to summarize the teachers' and students' evaluation of the CCDRM module and to evaluate the performance of the students based on their scores. For the fourth objective, mixed factorial analysis of variance (MANOVA) was used to compare the pre-and post-test scores of the students for those who had undergone synchronous and asynchronous classes. The significance of the difference was determined using the F-statistic and its corresponding p-value. Omega squared (ω^2) was used as an effect size index. Kirk's (1996) guidelines were used in describing the effect size: .01 means *small* difference; .06 means *moderately large* difference; and .14 means *large* difference. The abovementioned inferential procedures were bootstrapped via bias-corrected and accelerated (BCa) technique using 1000 bootstrap samples to control for possible effects of violations to normality and homoscedasticity. Residuals were found to be statistically independent; hence, the values produced were valid and at optimum.

RESULTS AND DISCUSSION

The following is the result of the conducted statistical analysis:

1. Teachers' evaluation

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Teachers evaluated the CCDRM module using a set of indicators. Mean and standard deviation were used to describe their evaluation. In terms of content, the teachers' evaluation was relatively high ($M = 4.40$, $SD = 0.30$). Some indicators with high ratings were "reflects the learning competencies of the curriculum" ($M = 5$, $SD = 0$), "well-organized" ($M = 4.67$, $SD = 0.58$), "gender and culture-sensitive ($M = 4.67$, $SD = 0.58$), "emphasizes important points using keywords, key concepts, and summary points" ($M = 4.67, SD = 0.58$

Table 1
Descriptive Statistics on the Teachers' Evaluation of the CCDRM Learning Module

Indicators	M	SD	Desc.
Content			
1. Has clearly defined objectives in each chapter/section/unit.	4.33	0.58	A
2. Is aligned with the learning objectives in the syllabus.	4.33	0.58	A
3. Reflects the learning competencies of the curriculum.	5.00	0.00	SA
4. Develop higher-order thinking skills.	4.00	0.00	A
5. Enhances manipulative skills (if applicable).	4.00	0.00	A
6. Is well-organized.	4.67	0.58	SA
7. Is gender and culture-sensitive?	4.67	0.58	SA
8. Cite references and related sources.	4.33	0.58	A
9. Contains complete, recent, and current information.	4.00	0.00	A
10. Emphasize important points using keywords, key concepts, and summary points.	4.67	0.58	SA
Overall	**4.40**	**0.30**	**A**
Design, features, and presentation			
1. Arrange topics sequentially.	5.00	0.00	SA
2. Reflects layout consistency in terms of font, spacing, indention, graphics, and pagination.	4.33	0.58	A
3. Has simple and clear instructions for teacher/s and students	4.00	0.00	A
4. Uses appropriate terms.	4.33	0.58	A
5. Has activities that motivate students to participate actively and master concepts and skills	4.33	0.58	A
6. Has varied illustrations and examples to facilitate learning.	4.00	0.00	A
7. Has supplementary activities that enhance critical thinking	4.33	0.58	A
8. Has lessons that may be utilized by other faculty.	4.33	0.58	A
Overall	4.33	0.14	A
Organization			
1. Topics and sub-topics are coherent in each chapter.	4.67	0.58	SA
2. Observe correct grammar and usage.	4.33	0.58	A
3. Paragraphs are well-organized.	4.33	0.58	A
Overall	4.44	0.19	A
Assessment tools			
1. Utilizes questions that help achieve the learning objectives.	4.33	0.58	A
2. Provide students with activities that require the application of what they learned.	4.33	1.15	A
3. Uses varied and appropriate evaluation tools (assignments, exercises, problem sets, learning checks, etc.).	4.33	0.58	A
4. Contains prescriptive exercises for remedial instruction.	4.00	0.00	A
Overall	4.25	0.43	A
Overall	4.36	0.21	A

M = Mean. SD = Standard deviation. Desc. = Description. Each description category used the scale from the questionnaire based on the Rounding Rule: Strongly disagree (1.00–1.49), disagree (1.50–2.49), neutral (2.50–3.49), agree (3.50–4.49), strongly agree (4.50–5.00). $N = 3$.

In terms of design, features, and presentation, the teachers' evaluation was also relatively high ($M = 4.33$, $SD = 0.14$). Some indicators with high ratings are "arranges topics in a sequential manner" ($M = 5.00$, $SD = 0.00$), "reflects layout consistency in terms of font, spacing, indention, graphics, and pagination" ($M = 4.33$, $SD = 0.58$), "uses appropriate terms" ($M = 4.33$, $SD = 0.58$), "has activities that motivate students to participate actively and master concepts and skills" ($M = 4.33$, $SD = 0.58$), "has supplementary activities that enhance critical thinking" ($M = 4.33$, $SD = 0.58$), "has lessons that may be utilized by other faculty" ($M = 4.33$, $SD = 0.58$).

In terms of organization, the teachers' evaluation was also high ($M = 4.44$, $SD = 0.19$). All indicators have high ratings, too, which include "topics and sub-topics are coherent in each chapter" ($M = 4.67$, $SD = 0.58$), "observes correct grammar and usage" ($M = 4.33$, $SD = 0.58$), "paragraphs are well-organized" ($M = 4.33$, $SD = 0.58$).

In terms of assessment tools, the teachers' evaluation was also high ($M = 4.25$, $SD = 0.43$). All indicators have high ratings, too, which include "utilizes questions that help achieve the learning objectives" ($M = 4.33$, $SD = 0.58$), "provides students activities that require the application of what they learned" ($M = 4.33$, $SD = 1.15$), "uses varied and appropriate evaluation tools" ($M = 4.33$, $SD = 0.58$), "contains prescriptive exercises for remedial instruction" ($M = 4.00$, $SD = 0.00$).

This supports the research mentioned by Gunarathne et al. (2019) and Hill & Wang (2018) and further reaffirms the value of OBE and procedures for constructive alignment. When developing and revising the qualification framework, the authorities, accreditation organizations, and higher education institutions must be aware of the norms, standards, and principles. This is why the OBE and constructive alignment procedures are crucial.

1.2. Students' evaluation

Students evaluated the CCDRM module using another set of indicators. Mean and standard deviation were used to describe their evaluation. In terms of the communicator characteristic, the students' evaluation was relatively high ($M = 3.93$, $SD = 0.60$). The students find the learning module to "improve their research, communication, and/ or skills." ($M = 4.07$, $SD = 0.74$), "help them to learn or consolidate knowledge of CCRRM principles by completing the tasks." ($M = 3.99$, $SD = 0.61$),

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"help them to recognize and value of communication as a tool for conveying my ideas and interacting with others and fostering my way of learning." ($M = 3.96$, $SD = 0.87$), "help them to be a good communicator in the subject of CCDRM they are engaged in." ($M = 3.90$, $SD = 0.88$), "help them fully and affirm that they understand what the other person has said as a sign of respect to the teacher." ($M = 3.72$, $SD = 0.88$).

Table 2
Descriptive Statistics on the Students' Evaluation of the CCDRM Learning Module

Indicators	M	SD	Desc
Communicator			
1. The learning module helps me to recognize and value of communication as a tool for conveying my ideas interacting with others and fostering my way of learning.	3.96	0.87	A
2. The learning module helps me to be a good communicator in the subject of CCDRM I am engaged in.	3.90	0.88	A
3. The learning module helps me fully (not clear in what aspect?) and affirms that I understand what the other person has said as a sign of respect to the teacher.	3.72	0.88	A
4. The learning module helps me to learn or consolidate knowledge of CCRRM principles by completing the tasks.	3.99	0.61	A
5. The learning module improves my research, communication, and/ or skills.	4.07	0.74	A
Overall	3.93	0.60	A
Inquiry-focused and knowledge			
1. The learning module makes me more knowledgeable (should this refer to research skills) through the process of research inquiry.	4.00	0.73	A
2. The learning module demonstrated comprehensive theoretical and technical concepts related to my field of study and relevant connections to industry, professional and regional knowledge.	3.85	0.82	A
3. The learning module encourages me to come up with new and creative ways to solve problems.	4.03	0.75	A
4. The learning module facilitated my understanding of the concepts of CDRM and allowed me to think critically with the help of my teacher, parents, or guardians.	3.94	0.79	A
5. The instructions on how to accomplish the assessment questions in the learning module are clear and appropriate.	4.03	0.57	A
Overall	3.97	0.54	A
Competent			
1. The learning module enables me to be an effective collaborator in a way that I respect other people's opinions.	3.96	0.74	A
2. The learning module helps me to initiate and innovate in a better way of doing things.	4.00	0.73	A
3. The learning module promotes quality and productivity in learning CCRDM.	4.12	0.72	A
4. The learning module motivates me to answer the questions and challenge me to think outside the box.	4.03	0.71	A
5. The learning module helps me learn and acquire the knowledge, skills, and competencies in it.	3.90	0.85	A
Overall	4.00	0.58	A
Collaborative			
1. The learning module assists me to work in collaboration with others and manage group functioning to meet our common goals.	3.94	0.79	A
2. The learning module allowed me to learn effectively with others be high-tech in classes and keep me interested and updated.	3.78	0.93	A
3. The learning module equips me with the right skills and charisma to lead small and large groups in the class.	3.87	0.79	A
4. The learning module helps me to develop my leadership abilities to full capacity, and feel accomplished, respected, and appreciated.	3.94	0.75	A
5. The learning module provides useful insights that result in objective decision-making.	3.91	0.88	A
Overall	3.89	0.64	A
Lifelong learner			
1. The learning module helps me to learn and acquire new skills and adapt to rapid changes in professional and personal environments.	3.97	0.81	A
2. The learning module helps me to develop respect for and understanding of others in finding common ground with anyone I can deal with.	3.99	0.78	A
3. The learning module motivates me to continue my activities and work independently to accomplish the requirements at the given time.	3.94	0.96	A
4. The learning module teaches me to be dynamic and adaptable to a new pace of learning.	3.99	0.80	A
5. The learning module keeps me moving and learning no matter what the stage of my context of learning.	4.04	0.82	A
Overall	3.99	0.64	A
Overall	3.95	0.56	A

In terms of the inquiry-focused and knowledge characteristics, the students' evaluation was also relatively high ($M = 3.97$, $SD = 0.54$). The students find the learning module to "make them more knowledgeable through the process of research inquiry" ($M = 4.00$, $SD = 0.73$), "demonstrate comprehensive theoretical and technical concepts related to their field of study and relevant connections to industry, professional, and regional knowledge" ($M = 3.85$, $SD = 0.82$), "encourage them to come up with new and creative ways to solve problems" ($M = 4.03$,

$SD = 0.75$), "facilitate their understanding of the concepts of CDRM and allowed them to think critically with the help of their teacher, parents, or guardians" ($M = 3.94$, $SD = 0.79$), "the instructions on how to accomplish the assessment questions in the learning module are clear and appropriate" ($M = 4.03$, $SD = 0.57$).

In terms of the competent characteristic, the students' evaluation was also quite high ($M = 3.97$, $SD = 0.54$). The students find the learning module to "promote quality and productivity in learning CCRDM" ($M = 4.12$, $SD = 0.72$), "motivate them to answer the questions and challenge them to think outside the box" ($M = 4.03$, $SD = 0.71$), "help them to initiate and innovate in a better way of doing things" ($M = 4.00$, $SD = 0.73$), "enable them to be an effective collaborator in a way that they respect other people's opinions" ($M = 3.96$, $SD = 0.74$), "help them learn and acquire the knowledge, skills, and competencies in it" ($M = 3.90$, $SD = 0.85$).

In terms of collaborative characteristics, the student evaluation was also high ($M = 3.89$, $SD = 0.64$). The students find the learning module to "assist them to work in collaboration with others and manage group functioning to meet their common goals" ($M = 3.94$, $SD = 0.79$), "help them to develop their leadership abilities to full capacity, feel accomplished, respected, and appreciated" ($M = 3.94$, $SD = 0.75$), "provide useful insights that result in objective decision-making" ($M = 3.91$, $SD = 0.88$), "equip them with the right skills and charisma to lead the small and large groups in the class" ($M = 3.87$, $SD = 0.79$), "allowed them to learn effectively with others and be high-tech in classes and keep them interested and updated" ($M = 3.78$, $SD = 0.93$).

In terms of the lifelong learner characteristic, the students' evaluation was also quite high ($M = 3.99$, $SD = 0.64$). The students find the learning module to "assist them to work in collaboration with others and manage group functioning to meet their common goals" ($M = 3.94$, $SD = 0.79$), "help them to develop their leadership abilities to full capacity, feel accomplished, respected, and appreciated" ($M = 3.94$, $SD = 0.75$), "provide useful insights that result in objective decision-making" ($M = 3.91$,

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$SD = 0.88$), "equip them with the right skills and charisma to lead the small and large groups in the class" ($M = 3.87$, $SD = 0.79$), "allowed them to learn effectively with others and be high-tech in classes and keep them interested and updated" ($M = 3.78, SD = 0.93$).

Learning modules are more successful in teaching-learning techniques as compared to traditional teaching approaches since they allow students to learn at their own speed, according to research by Ambayon (2020). It is an unlimited self-learning tool that provides immediate feedback, and comments on practice exercises, and encourages and fosters students' curiosity.

1.3. Students' performance

The level of performance of the students was measured before and after the administration of the CCDRM module and delivered in two (2) different ways, i.e., synchronous and asynchronous delivery. During the pre-test, students who would undergo asynchronous classes ($M = 21.86, SD = 6.67$) had slightly higher performance compared to those who would undergo synchronous classes ($M = 19.88, SD = 5.70$). This was evident since there was a higher proportion of students with moderate performance (8, 28.6%) for asynchronous classes and less students with low performance (20, 71.4%) compared to those who would undergo synchronous classes (36, 87.8% for low performance; 5, 12.2% for moderate performance).

Table 3
Descriptive Statistics on the Level of Performance of the Students Before and After the Administration of the CCDRM Learning Module Across Learning Deliveries

| | Synchronous | | | | Asynchronous | | | |
| | Pre-test | | Post-test | | Pre-test | | Post-test | |
Level of performance	f	%	f	%	f	%	f	%
Low performance	36	87.8	27	65.9	20	71.4	15	53.6
Moderate performance	5	12.2	13	31.7	8	28.6	12	42.9
High performance	0	0.0	1	2.4	0	0.0	1	3.6
M		19.88		24.80		21.86		26.79
SD		5.70		5.79		6.67		7.96

M = Mean. SD = Standard deviation. The level of performance was described using the following ranges: 0–49% means low, 50–74% means moderate, 75–100% means high.

Students who underwent asynchronous classes ($M = 26.79, SD = 7.96$) had slightly higher performance compared to those who underwent synchronous classes ($M = 24.80, SD = 5.79$). This was evident since there was a higher proportion of students with moderate performance (12, 42.9%) for asynchronous classes and less students with low performance (15, 53.6%) compared to those who underwent synchronous classes (27, 65.9% for low performance; 13, 31.7% for moderate performance).

With the right training and support, educators in the traditional learning environment can and do produce high-quality instructional materials that are advantageous to both the learners and the educators. Similar results were seen in the studies of Quinones and Bernardo (2020), and during the post-test and pre-test for modular distance, the same trend was observed.

1.4. Difference in students' performance

A mixed analysis of variance was conducted to determine whether the students' scores were different across the two (2) tests and the two (2) learning deliveries. Based on the analysis, there was no statistically significant difference in the scores for synchronous ($M = 22.34$, $SE = 0.89$) and asynchronous ($M = 24.32$, $SE = 1.08$) classes, $F(1, 67) = 1.99$, $p = .163$. This means that the scores of the students were the same regardless of whether the learning module was delivered synchronously or asynchronously. The effect size index indicates that the difference is very small, $\omega^2 = .007$.

There was a statistically significant difference in the pre- ($M = 20.87, SE = 0.75$) and post-test ($M = 25.80$, $SE = 0.83$) scores of the students, $F(1, 67) = 46.58$, $p < .001$. Looking at the means, it was found that the student's scores were higher after ($M = 25.80$, $SE = 0.83$) administering the learning module compared to before ($M = 20.87$, $SE = 0.75$). The effect size indicates that a moderately large difference exists between the pre-and post-test scores, $\omega^2 = .123$.

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Table 4
Descriptive and Inferential Statistics on the Difference in the Students' Scores Before and After the Administration of the Learning Module Across Learning Delivery

Levels	M	SE	F [a]	p	ω^2
Delivery					
Synchronous	22.34 [A]	0.89	1.99	.163	.007
Asynchronous	24.32 [A]	1.08			
Test					
Pre-test	20.87 [A]	0.75	46.58***	< .001	.123 [††]
Post-test	25.80 [B]	0.83			
Delivery × test					
Synchronous, pre-test	19.88 [A]	0.95	< 0.01	.999	< .001
Synchronous, post-test	24.81 [B]	1.05			
Asynchronous, pre-test	21.86 [A]	1.15			
Asynchronous, post-test	26.79 [B]	1.28			

M = Mean. SE = Standard error of the mean. Superscripts on means indicate significant subgroups using *post hoc* analysis corrected using Holm's method.
[a] $df_M = 1$, $df_R = 67$.
*** $p < .001$. [††] Moderately large difference

There was a statistically significant difference in the pre- ($M = 20.87$, $SE = 0.75$) and post-test ($M = 25.80$, $SE = 0.83$) scores of the students, $F(1, 67) = 46.58$, $p < .001$. Looking at the means, it was found that the student's scores were higher after ($M = 25.80$, $SE = 0.83$) administering the learning module compared to before ($M = 20.87$, $SE = 0.75$). The effect size indicates that a moderately large difference exists between the pre-and post-test scores, $\omega^2 = .123$.

Finally, there was no statistically significant interaction effect of the mode of delivery and the test administered, $F(1, 67) < 0.01$, $p = .999$, $\omega^2 < .001$. Looking at the means, there was a significant increase in the scores of the students before and after the administration of the learning module for both the synchronous and asynchronous classes. This indicates that the increase would have occurred regardless of the learning delivery used.

This is consistent with research by Douglas (2016) & Gueta (2021), who found that courses that teach crucial social, academic, and adjustment skills like time management, exam strategies, reading comprehension, and note-taking techniques increase students' success in their coursework and provide a useful framework from which they can learn effectively.

CONCLUSIONS

The overall results of the teachers' evaluation and students' evaluation the CCDRM module show relatively high using the set indicators. As to the student performance during the pre-test, there was a higher proportion of students with moderate performance for asynchronous classes and less students with low performance compared to those who would undergo synchronous classes. The same pattern was seen during the post-test, there was a higher proportion of students with moderate performance for asynchronous classes and less students with low performance compared to those who underwent synchronous classes. Finally, in students' performance, there was no statistically significant difference in the scores for synchronous and asynchronous classes. This means that the scores of the students were the same regardless of whether the learning module was delivered in a synchronous or asynchronous manner. It is essential to continue to study the conditions of underlying affecting the students' performance for researchers and educators working on academic achievements and the like.

RECOMMENDATION

This study demonstrated the efficacy of synchronous and asynchronous methods for teaching climate change and disaster risk reduction to university students. Because this technique is a distinctive manner of teaching, it may be used broadly in numerous disciplines and topics and at different levels of education. As a result, instructors should get enough training on how to develop and administer a module in a classroom context.

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