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REVIEW ARTICLE

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THE IMPACT OF COMPUTER-AIDED INSTRUCTIONAL MATERIALS ON STUDENTS' ACADEMIC PERFORMANCE IN SCIENCE 7

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Abstract: The goal of the research is to assess the impact of Computer-Aided Instructional Materials on student's academic performance in Science 7. The particular subjects covered in basic biology can be utilized as a workbook for general education or as an additional reference for teachers to improve their approach to teaching and successfully foster a love of learning in their students. Initially, the researcher assembled a collection of visual and graphic interactive techniques from multiple General Biology references to create the computer-aided Instructional material. To collect the necessary number of subjects for the study, the researcher created a pre-validated survey questionnaire that was broken down into three sections: the first section covers the demographic distribution profile of the respondents; the second section contains the basis for evaluating the respondents' level of acceptability based on the following criteria: learning outcomes or objectives, then content, usefulness, clarity, presentation, appropriateness, language, and style; the third section uses the subject's numerical response as the foundation for suggesting the instructional material. To create and comprehend the content and implementation of the developed computer-aided instructional material, the study employed the descriptive comparative technique of research. The findings suggest that the Instructional material contains all the necessary components to promote improved learning facilitation and increase biology student engagement. The majority of respondents thought positively of the suggested Instructional Material. The said Instructional materials are entertaining, encourage critical thinking, encourage active involvement, and help teachers and students retain the material.

Keywords: assess, computer- aided instructional, impact, workbook

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1.1 Introduction

Science and technology have a way of revealing to us new developments and trends in technology that are now highly relevant to human existence. Technology demonstrates how nations' less developed traits can be altered by transforming their social and cultural frameworks. Both the knowledge that gave a good impression and the crucial technological advancements have been essential for growth and advancement.

Students who get instruction in the art of science eventually develop positive attitudes and information-related behaviors. Raising individuals capable of adjusting to the constantly changing demands of the computer age was one of the primary objectives of science as it developed.

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Students who get instruction in the art of science eventually develop positive attitudes and information-related behaviors. Raising individuals capable of adjusting to the constantly changing demands of the computer age was one of the primary objectives of science as it developed. In any topic he teaches, one can profit from the most recent technology advancements at any time, demonstrating the importance of all these ground-breaking technological discoveries and advancements.

Due to its integration with certain classroom activities, computer-aided instruction has gained awareness among certain traditional educators. More than the usual lecture approach they frequently use in class, it allows them to validate their students' perceptions to reply. The learners' preference for learning is evident from their requests to use the LCD projector and for computer-aided instructional strategies and methods.

According to Corpuz (2016), the terms interactive, integrated, introspective, reflective, contextualized, experiential, collaborative, and cooperative are the best ways to describe an effective instructional technique, such as the use of computer-aided instructional material. The students can communicate with one another. The most important resource for education is the student himself.

The researcher concluded that the idea of creating a computer-aided instructional material, especially for Grade 7 students is a smart place to start for the Philippine educational system in terms of offering a thorough laboratory guide that is both relevant and straightforward. The content and usefulness of this educational workbook are acknowledged on a global scale.

2.1 Research Methodology

The researcher created a pre-validated survey questionnaire with three sections for evaluation purposes and to gather the required number of study subjects. The first section covers the demographic distribution of the respondents; the second part contains the basis for determining the level of acceptability of the respondents based on the objectives or learning outcomes, followed by the content, usefulness, clarity, presentation, appropriateness, language, and style; and the third part bears the subject's numerical response as the basis for recommending the instructional material.

The researcher first created the computer-aided instructional material by gathering several graphic and visual interactive techniques from several General Biology texts. Only themes related to microscopy, organization level, plant and animal cells, and ecosystems were covered by the

instructional material. It includes an introduction before each activity, the study's learning objectives, and a list of techniques for analyzing the different General Biology topics. Additionally, the workbook has an additional section that serves as a guide for guided questions, allowing the student to respond to a series of questions about the subject matter.

Topics covered by the instructional material were restricted to microscopy, organization level, plant and animal cells, and ecosystems. It includes an introduction before to each activity, the study's learning objectives, and a list of techniques for analyzing the different General Biology topics. Additionally, the workbook has an additional section that served as a guide for guided questions, allowing the student to respond to a series of questions pertaining to the subject matter.

2.2 Statistical Analysis of Data

The following statistical tools were used to analyze and interpret the collected data:

Frequency Distribution and Percentage. It was used to present and analyze the profile of the respondents.

Weighted Mean. It was used to determine the level of acceptability of the proposed Computer-aided instructional material and to find the overall recommendation towards the use of the scale below:

Scale	Interval	Qualitative Description
4	3.50 – 4.0:	Highly Acceptable/ Recommended
3	3.00 – 3.49:	Acceptable/ Recommended
2	2.00 – 2.99:	Moderately Acceptable/ Recommended
1	1.00- 1.99:	Least Acceptable/ recommended

Analysis of Variance (ANOVA). It was used to determine if there was a significant difference in the acceptability of the computer-aided instructional material as assessed by the respondents when grouped according to their profile (age, gender, length of service, and highest educational attainment).

3.1 Presentation, Analysis, and Interpretation of Data

This chapter includes the presentation, analysis, and interpretation of data that aim to assess the impact of the performance of the grade 7 students towards the computer-aided instructional material.

3.2 Demographic Profile of the Respondents

Table 1.1 presents the frequency and percentage distribution of the teacher-respondents' profiles. Based on the table, the majority of the teacher-respondents are females (F=20 or 83%), where most of their age ranges from 26 to 40 years old (F=20 or 88%), with six (6) years or more experience in the teaching profession and with earned units in the master's program. The data reveal that the teacher-respondents are young professionals who are very active and have notable experience in teaching science.

Table 1.1 Frequency and Percentage Distribution of the Teacher-Respondents' Profile

Profile	Frequency	Percentage
Gender		
Male	4	17
Female	20	83
Age		
21-25 Years Old	1	4
26-30 Years Old	9	38
31-35 Years Old	2	8
36-40 Years Old	10	42
More than 40 Years Old	2	8
Length of Service		
1-5 Years	1	4
6-10 Years	8	33
11-15 Years	7	29
16-20 Years	6	25
More than 20 Years	2	8
Highest Educational Attainment		
Bachelor Degree	2	8
Bachelor's Degree with MA/MS Units	21	88
Ph.D./EdD Degree	1	4
Total	24	100

3.3 Level of Acceptability of the Proposed Computer-Aided Instructional Material Assessed by Faculty Members

Table 1.2 presents the level of acceptability of the proposed computer-aided instructional workbook as assessed by faculty members in terms of objectives. Based on the table, the respondents rated the items "Learning outcome was in-line with the mission, goals and learning outcome of science both departmental and institutional" (WM=4.00); "Consists of learning opportunities and institutional" (WM=3.88); "Appropriate and can be achieved within time-frame" (WM=3.88); "Complex and sufficient to improve students' performance and achievements" (WM=3.86); and "Institutional Learning outcome provided in each lesson can change students' behavior" (WM=3.75) as "highly acceptable" as evidenced by the obtained weighted means.

Furthermore, an average weighted mean of 3.87 with a qualitative description of "highly acceptable" was obtained. The results revealed that the Computer-Aided Instructional Material has a greater acceptability level as to sufficiency and completeness, which gives the students opportunities to improve knowledge, understanding, and skills.

Table 1.2 Summary of the Level of Acceptability of the Proposed Computer-Aided Instructional Material as Assessed by Faculty Members

Indicator	Average Weighted Mean	Qualitative Description
Objectives	3.87	Highly Acceptable
Content	3.88	Highly Acceptable
Usefulness	3.70	Highly Acceptable
Clarity	3.89	Highly Acceptable
Presentation	3.91	Highly Acceptable
Language and Style	3.75	Highly Acceptable
Appropriateness	3.85	Highly Acceptable
Grand WM	3.83	Highly Acceptable

Legend: 1.00-1.49 Least Acceptable (LA), 1.50-2.49 Moderately Acceptable (MA), 2.50-3.49 Acceptable (A), 3.50-4.00 Highly Acceptable (HA)

3.4 Test of Significant Difference in the Level of Acceptability of the Proposed Computer-Aided Instructional Material among the Respondents when Profile was Considered

Table 2 presents the comparison of respondents' level of acceptability of the proposed computer-aided instructional material in terms of gender. Concerning objectives, since the computed P-value of 0.712 is greater than the 0.05 level of significance; thus, the null hypothesis is accepted. Therefore, there is no significant difference in the level of acceptability of the proposed Computer-aided instructional material among the respondents as to objectives when gender is considered.

Similarly, concerning the content, since the computed P-value of 0.849 is greater than the 0.05 level of significance; thus, the null hypothesis is accepted. Therefore, there is no significant difference in the level of acceptability of the proposed Computer-aided instructional material among the respondents as to content when gender is considered.

Likewise, concerning usefulness, since the computed P-value of 0.503 is greater than the 0.05 level of significance; thus, the null hypothesis is accepted. Therefore, there is no significant difference in the level of acceptability of the proposed Computer-aided instructional material among the respondents as to usefulness when gender is considered.

Also, concerning clarity, since the computed P-value of 0.805 is greater than the 0.05 level of significance; thus, the null hypothesis is accepted. Therefore, there is no significant difference in the level of acceptability of the proposed Computer-aided instructional material among the respondents as to clarity when gender is considered.

Correspondingly, concerning the presentation, since the computed P-value of 0.893 is greater than the 0.05 level of significance; thus, the null hypothesis is accepted. Therefore, there is no significant difference in the level of acceptability of the proposed Computer- aided instructional material among the respondents as to presentation when gender is considered.

Concerning language and style, since the computed P-value of 0.051 is more than 0.05 level of significance; thus, the null hypothesis is accepted. Therefore, there is a significant difference in the level of acceptability of the proposed Computer- aided instructional material among the respondents as to language and style when gender is considered.

Finally, concerning the appropriateness, since the computed P-value of 0.061 is greater than the 0.05 level of significance; thus, the null hypothesis is accepted. Therefore, there is no significant difference in the level of acceptability of the proposed Computer aided instructional material among the respondents as to appropriateness when gender is considered.

These results show that whether the respondents are males or females, they have a similar assessment of the Computer-aided instructional material as to objectives, content, usefulness, clarity, presentation, and appropriateness; however, they may share different opinions in the language and style. The Computer-aided instructional material may be universally used as instructional material in teaching Biology in grade 7.

The result is supported by the study of Computer-Assisted Instruction (CAI), that the teaching method consisted of self-learning principles.

Table 2. Summary of Comparison of Respondents' Level of Acceptability of the Proposed Computer-Aided Instructional Material

	Computer-Aided Instructional Workbook		
Profile	**P-Value**	**Decision**	**Remark**
Gender	0.802	Accept Ho	Not Significant
Age	0.196	Accept Ho	Not Significant
Length of Service	0.076	Accept Ho	Not Significant
Highest Educational Attainment	0.071	Accept Ho	Not Significant
Legend: Significant at P<0.05			

3.5 Overall Recommendation of the Respondents toward the Use of the Instructional Material

Table 3 presents the respondents' overall recommendation regarding using the instructional material. The data reveals that the respondents highly recommend the developed Computer-aided instructional material. The developed Instructional Material may be used to teach Biology among grade 7 students, preferably if the topic concerns a cell's concepts, parts, and domains.

Furthermore, the results imply that the Instructional Material has all the essential portions, which will encourage better facilitation of learning and make students more engaged in Biology. In addition, the Instructional Material may claim that it contains vital learning objectives, clear procedures, appropriate guide questions, and creative visual graphic presentations leading to the utilization of computer-simulated cameras crafted for individualized learning.

Table 3: Overall Recommendation / Impact of the Respondents Towards the

Indicator	Weighted Mean	QD
Recommendation	**3.62**	**Highly Recommended**
Legend: 1.00-1.49 Least Recommended, 1.50-2.49 Moderately Recommended, 2.50-3.49 Recommended, 3.50-4.00 Highly Recommended		

Use of the Computer-Aided Instructional Material on the students' academic performance

4.1 Summary of Findings

4.2 Demographic Profile of the Respondents

The majority of the teacher-respondents are females (F=20 or 83%), where most of their ages range from 26 to 40 years old (F=20 or 88%), with six (6) years or more experience in the teaching profession and with earned units in the master's program.

4.3. Level of Acceptability of the Proposed Computer-Aided Instructional Material as Assessed by Faculty Members

In terms of objectives, an average weighted mean of 3.87 with a qualitative description of "highly acceptable" was obtained. In terms of content, an average weighted mean of 3.88 with a qualitative description of "highly acceptable" was obtained. In terms of usefulness, an average weighted mean of 3.70 with a qualitative description of "highly acceptable" was obtained. In terms of clarity, an average weighted mean of 3.89 with a qualitative description of "highly acceptable" was obtained. In terms of presentation, an average weighted mean of 3.91 with a qualitative description of "highly acceptable" was obtained.

In terms of language and style, an average weighted mean of 3.75 with a qualitative description of "highly acceptable" was obtained. In terms of evaluation, an average weighted mean of 3.85 with a qualitative description of "highly acceptable" was obtained. The overall summary of the level of acceptability of the proposed computer-aided instructional workbook as assessed by faculty members obtained a grand weighted mean of 3.83, strengthening the claim that the computer-aided instructional material is "highly acceptable" by the respondents.

4.4 Overall Recommendation of the Respondents Toward the Use of the Instructional Material

The data reveals that the respondents highly recommend the developed Computer-aided instructional material.

5.1 Conclusions

Based on the summary of the findings of the study, the researcher concluded the following:

- Most of the teacher-respondents were females whose ages ranged from 26 to 40 years old, with at least six (6) years or more experience in the teaching profession and earned units in the master's program.

- There is no significant difference in the level of acceptability of the proposed Computer-aided instructional workbook among the respondents based on the profiles (age, gender, length of service, and highest educational attainment).
- Most respondents highly recommended the proposed Computer-aided Instructional Material since there is active learning and participation among teachers and students during classroom hours.
- The Instructional material is enjoyable, foster active engagement, develop critical thinking, and promote retention among the learners and teachers. It lessens the preparation for their daily routine and enhances teaching methodology/strategy. It is also commendable in the new normal.

5.2 Recommendations

Based on the conclusions drawn from the study, the researcher would like to recommend the following:

- More topics in science and biology should be developed and integrated into computer-aided instructional materials since this will enhance the learning capabilities while encouraging active participation among the students.

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