Student Perception on the Extent Use of Instructional Material in Teaching Computer Organization Course

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Abstract: **- Instructional materials (IM) play an essential role in the teaching and learning process. IM's can be in the form of video, workbook, and textbook to enhance the knowledge and skills of the student. Books and instructional materials are some of the learning materials that the teacher use to deliver the experience and expertise to the student. However, factory produced instructional materials are insufficient and expensive because of the high-cost instructional material provided by the publishing companies, teachers are encouraged to create instructional materials. Moreover, because of the poor academic performance of students in Computer Organization Course which attributestoo numerous factors among which is the instructor's approach in teaching the class due to the limited resources available in the library. However, several conducted studies on the development of instructional materials, but none of this study has been performed to determine the effectiveness of using improvised instructional materials to improve the academic performance of the student. This study shall employ a quantitative research approach using descriptive-correlation design. The respondents of the survey are the 2nd year Bachelor of Science in Information Technology (BSIT) students enrolled in the course Computer Organization at Leyte Normal University. A total of 53 students who were identified to answer the survey questionnaire on the extent use of the instructional material in teaching Computer Organization course. The output of this study will serve as the basis for the revision of the instructional materials used in Computer Organization course.**

Keywords: **Instructional Material, Correlation, Assessment, Information Technology, Instructional Design, Usefulness**

I. INTRODUCTION

Instructional materials (IM) play an essential role in the teaching and learning process. Instructional materials as significant tools necessary for teaching and learning of school subjects to enhance teachers' efficiency and improve students' performance[1]. Likewise,instructional material is defined as items or gadgets that help the instructors to introduce their lessons sensibly and successively to the students[2]. Instructional materials can be in the form of video, workbook, and textbook to enhance the knowledge and skills of the student. Books and instructional materials are some of the available learning materials that the teacher use to deliver the experience and expertise to the student. These contain the expected lesson that students need to learn, which most teachers focus their teaching on the material included in the book they use. Learning can happen as an outcome of newly acquired skills, cognition, perception, facts and new information at hand. Memorizing can be reinforced with instructional materials of a different sort because they stimulate, motivate and as good as arrest learners' attention for a spell during the teaching operation. Instructional materials are learning aids and devices through which teaching and learning done in schools. Non-accessibility and non-usage of learning materials might result in poor education as components in the burden of the utilization of teaching strategies[3].Hence, the significance of improvisation of instructional materials as making learning concrete and genuine that enables the students to take part in the creation of documents[4].

However, studies reported that the factory produced instructional materials are insufficient and expensive[5]. Also,the advantages of instructional materials are that they are less costly to create and helpful in showing the vast number of students to give careful consideration to enhanced there learning[6]. Nonetheless, successful teaching and learning requires an instructor to teach students with instructional materials and utilize functional exercises to make adapting more remarkable, intelligent, practical and pragmatic[7]. Instructional materials assist the teaching and learning environment more exciting[8]. Universities in the Philippines have a scarcity of resources in IT books. As mentioned in the study of [9]with limited IT books found in the library; there is a need for the development of instructional materials for IT classes to supplement learning/teaching process in the delivery of IT lessons.

A similar study of[10] mentioned that due to the high cost of instructional material provided by the publishing companies' teacher are encouraged to produce localized instructional materials. It is a challenge for the college teachers to developeffective instructional materials to help students improved their academic performance even though acquisitions of standard computer books at the tertiary level are limited and with financial constraints. The Nigerian school is facing a similarproblem because of financial constraint battling the education sector which make it impossible for the government to provide instructional materials in schools. Resourcefulness are encouraged to improvise instructional materials to improve the quality of educational and promote academic standard in Nigerian schools[11]. Hence, in the study of[12]the result shows no significant difference between students taught with the developed instructional material than those using the standard books from the publishing companies.

Also, it isrecommended that teachers should have training on how to create instructional materials that will make learning more exciting and stimulating[13].An overview, sending faculty in the tertiary level to formal training on the development of instructional materials is essential to help students achieve their goals and can perhaps compete with the quality of materials and output closely near to the standard books developed by a publishing company. However, the development and effectiveness of instructional material are dependent on the instructional design and constructivist theory. Instructional theory is an explicit guide on how to better help learners' developed their cognitive, emotional, social learning[14]. While, Constructivists' theory deals on the learner acquires knowledge based on their experiences in the teaching-learning situation[15].

Leyte Normal University offers a Bachelor of Science in Information Technology (BSIT) program. Wherein, Computer Organization (CO) is one of the essential subjects offered to the 2nd Year BSIT students. In the study of [9] Computer Organization is one of those many subjects mentioned that there is a need to develop instructional material. Computer organization course description deals with the hierarchical structure and logic design of a computer. Computers perform calculations using components called logic gates, which are made up of integrated circuits that receive an input signal, process it, and change it into an output signal[16]. Topics included in this course are Binary conversion, Boolean algebra, logic gates, microprogramming and memory management.

Statement of the Problem

However, the poor academic performance of students is attributed to numerous components among which is the instructor's approach in teaching the class due to the limited resources available in the library. Teaching the course without instructional materials to support the teaching /learning process may result in the poor scholastic performance of the student.

Research Questions

Several studies conducted on the development of instructional materials, but none of this study unravels the perception of the students. It will correctly answer the following questions:

1. What is the perception of the respondent in term of:

    a. Content;

    b. Instructional design;

    c. Assessment

2. What is the level of utilization of instructional material in the teaching/learning process?

3. What is the level of usefulness of instructional material as a tool in the teaching/learning process?

4. Is there a significant correlation between the Usefulness and Utilization?

5. Is there a significant correlation between the Usefulness regarding

    a. Content;

    b. Instructional design;

    c. Assessment

II. METHODOLOGY

Research Design

This study employed a quantitative research approach using a descriptive- correlation design. The descriptive research design Student Perception on the Extent Use of Instructional Material in Teaching Computer Organization Course. This type of model is used to describe the current status of phenomena to describe what existsabout the conditions in a situation[17].

Respondents of the study

The respondents of the survey are the 2nd year Bachelor of Science in Information Technology(BSIT) students enrolled in the course Computer Organization at Leyte Normal University. A total of 46 students out of 53 students who were identified to answer the survey questionnaire on the extent use of the instructional material in teaching Computer Organization course. During the time the survey questionnaire was administered there is seven (7) student who was absent.

Research Method

At the start of the 2nd semester of SY 2017-2018 a developed instructional material was given to the 2nd year BSIT enrolled in Computer Organization course. Since, November of 2017 to January 2018 almost three months, the IT students have been using the instructional materials to help the Computer Organization teacher in teaching the topic Number Conversion, Arithmetic operations (binary, octal, hexadecimal) Simplifying the Boolean expression using Boolean Algebra. The survey questionnaire was a patternonPrince Edward Island, Evaluation and Selection of Learning Resources survey form. However, there was a little change from the original questionnaire to suit the current study[18].

Moreover, the inquiry is composed of four (4) parts: Part I focus on the content; instructional design and assessment; Part II on the extent use of instructional materials; Part 3: Rate the effectiveness of using instructional materials and Part 4; What recommendation that will be the basis for the revision of instructional materials. The questionnaire was given personally during class schedule MTh 9:00-10:30 and TFri 9:00 -10:30. The interview was conducted to understand the result from the quantitative data further.

Treatment of Data

This study utilized Microsoft Excel 2010 to specify the cause of frequency count, percentages, mean as statistical tools in determining the perception of the respondents in using instructional materials based on the content; instructional design, and assessment, and utilized SPSS software for them to correlate the student perception and the usefulness of the instructional material.Below qualitative description used for instructional material regarding Content, Instruction Design,and Assessment.

Qualitative Description for Content, Instructional Design, and Assessment

Rating Scale	**Qualitative Description**
5	Strongly agree
4	Agree
3	Undecided
2	Disagree
1	Strongly disagree

Below is the limit scale and the qualitative description for the Content, Instructional Design, and Assessment

Frequency Distribution	**Qualitative Description**
4.21-5.00	Strongly agree
3.41-4.20	Agree
2.61-3.40	Undecided
1.81-2.60	Disagree
1-1.80	Strongly disagree

Qualitative Description of the extent use of Instructional material

Rating Scale	**Qualitative Description**
5	Always
4	Very often
3	Sometime
2	Rarely
1	Never

Limit Scale for the extent use of Instructional material

Frequency Distribution	**Qualitative Description**
4.21-5.00	Always
3.41-4.20	Very often
2.61-3.40	Sometime
1.81-2.60	Rarely
1-1.80	Never

Qualitative Description for the Effectiveness of Instructional Material

Rating Scale	**Qualitative Description**
5	Extremely useful
4	Very useful
3	Somewhat useful
2	Slightly useful
1	Not useful

Limit scale for the Effectiveness of Instructional Material

Rating Scale	**Qualitative Description**
4.21-5.00	Extremely useful
3.41-4.20	Very useful
2.61-3.40	Somewhat useful
1.81-2.60	Slightly useful
1-1.80	Not useful

III. RESULT AND DISCUSSION

Table 1: Instructional Material regarding Content

CONTENT	**Weighted Mean**	**Qualitative Description**
1. The syllabus identified course objectives and method of grading.	**4.20**	**Strongly Agree**
2. The course content was consistent with the stated course objectives.	**4.41**	**Strongly Agree**
3. The course content was arranged in a clear, logical and orderly manner.	**4.22**	**Strongly Agree**
4. Content is current	4.13	Agree
5. Content is accurate	**4.22**	**Strongly Agree**
6. Scope and depth of topic are appropriate to student needs.	**4.30**	**Strongly Agree**
7. The level of difficulty is appropriate for the intended students	4.15	Agree
8. Content integrates "real-world" experiences.	3.98	Agree
GRAND MEAN	**4.20**	
Qualitative Description	**Agree**	

Table 1 represents the perception of the respondents regarding content in the instructional materials. Instructional materials should be that the course content is consistent with the stated objective with a mean of four and forty-one (4.41). Followed by Scope and depth of topic are appropriate to the student needs with four and thirty (4.30). Then, Content is accurate, and The course content arranged in a clear, logical and orderly manner with a mean of forty and twenty-two (4.22) were identified by the respondent as **Strongly Agree.** Also, Content is accurate with a mean of forty and thirteen (4.13), followed by The level of difficulty is appropriate for the intended students with a mean of four and fifteen (4.15). Finally, Content integrates the respondent identified real-world experience with a mean of three and ninety-eight (3.98) as **Agree.** As a result, the perception of the respondent on

Instructional materials regarding Content has Grand Mean of 4.20 with a qualitative description as **Agree.**

It implies that in the development of instructional material the content is focused on the student needs and in-line with the course objectives in the syllabus. Wherein, in the curriculum, the contents are arranged according to the level of difficulty and arepresented accurately. The developed a model for an instructional development called Four D-Model (Define, Design, Develop, and Disseminate). Define stage; it identifies the objective and constraint of instructional materials[19]. This set of objectives is used as the basis for test construction and later integrated into the instructional materials that the teachers utilized. Additionally, developing instructional materials, it is required to address students' needs. It will ensure that the materials meet the needs of the students and teachers' expectations[20].

Table 2: Instructional Material regarding Instructional Design

INSTRUCTIONAL DESIGN	Weighted Mean	Qualitative Description
9. The material is suitable for a wide range of learning/teaching styles.	**4.20**	**Strongly Agree**
10. The material promotes student engagement	**4.20**	**Strongly Agree**
11. The methodology promotes active learning	**4.20**	**Strongly Agree**
12. The methodology promotes the development of communication skills.	4.11	Agree
13. The material encourages group interaction	**4.22**	**Strongly Agree**
14. The material encourages student creativity.	3.85	Agree
15. The material allows/encourages the student to work independently.	**4.28**	**Strongly Agree**
16. Materials are well organized and structured.	4.11	Agree
17. Material promotes retention	3.91	Agree
18. Concepts are clearly introduced	4.15	Agree
GRAND MEAN	**4.12**	
Qualitative Description	**Agree**	

Table 2 shows the perception of the respondent regarding instructional design. Instructional material is suitable for a wide range of learning/teaching styles; article promotes student engagement and methodology supports active learning with mean four and twenty (4.20) or as identified by respondents as **Strongly agree.** Moreover, the report encourages group interaction with a mean of four and twenty-two (4.22) or determined by respondents as **Strongly agree.** Also, the material allows/ helps the student to work independently with a mean of four and twenty-eight (4.28) or **Strongly agree.** Lastly, the rest of the indicators the respondents **Agree** that the instructional material promotes the development of communication skills, the articleencourages student creativity, items are well organized and structured, materials encourage retention, and the concepts are well introduced.

It implies that instructional design should be engaging that allows students to work independently and promote harmonious group interaction. Hence, instructional design can have utilized a variety of teaching/learning style to cater individual needs of the students. The results are views that students learn faster through activity oriented instruction and when students are not actively involved in the learning process, performance becomes poor[21].

Hence,teachers are encouraged to create instructional materials for teaching/learning that are useful, easy to use, and enjoyable to the learners[22]. The instructional material should stimulate student interest, encourage participation, and make learning more meaningful and fun[23]. Furthermore, to enhance the instructional design individual differences needs should be recognized and integrated into the design phase[24]. The instructional material should be not only flexible but also support diverse learners with different learning styles.

Table 3: Instructional Material regarding Assessment

ASSESSMENT	Weighted Mean	Qualitative Description
19. Appropriate follow-up activities are provided	4.26	Strongly Agree
20. Adequate assessment/evaluation tools are provided.	4.26	Strongly Agree
21. The course's assignments (readings, problem sets, essays, projects, reports, in-class exercises, etc.) helped you learn.	4.70	Strongly Agree
22. Graded materials (exams, quizzes, assignments, reports, projects, etc.) reflected what was taught in the course.	4.59	Strongly Agree
23. The instructor used timely feedback of the quizzes and assignment	4.52	Strongly Agree
24. You put effort into learning the materials covered in this course.	4.43	Strongly Agree
25. You are challenged to do your best in this course.	4.65	Strongly Agree
26. You are encouraged to ask questions.	4.35	Strongly Agree
GRAND MEAN	**4.47**	
Qualitative Description	**Strongly Agree**	

Table 3 refers to the perception of the respondents regarding assessment. In all indicator, the respondents **Strongly agree** or Grand Mean of four and forty-seven.It implies that there should be adequate exercises, activities, and quizzes included in the instructional materials that will help the student learn the topics. Timely feedback is necessary to inform and support the students improved in their skills and knowledge in Computer Organization. Hence,designed learning activities for the improvement of student metacognition and problem-solving skills and management strategies[24]. Furthermore, assessment is integrated into the learning environment, not as an add-on to instructional design or separate process of pre-test, posttest[25,26].

Table 4: Extent use of Instructional Material

How often do you use the Computer Organization instructional materials?	Always	Very Often	Sometimes	Rarely	Never
TOTAL	15	14	17	0	0
MEAN	**3.96**				
Qualitative Description	**Very Often**				

Table 4 shows the perception of the respondents on the extent use of Computer Organization instructional material. Wherein Computer Organization instructional material is being used **Very Often** or with a mean of three and ninety-six (3.96). It implies that the use of the instructional material is used frequently in the class. Several reasons affect the utilization of the instructional material in Computer Organization course. First, the shortening of classes, having one hour and thirty-minute class period will not be able to use the IM's if the teacher will still need to perform the checking of student attendance. Second, supplementation of other instructional material like videos and internet resources to help the student understand more about the topic.

Additionally, teachers should maximize the use of instructional material during class instruction to get the maximum advantage in the teaching/learning process[27].

Table 5: Usefulness of Instructional Material

How would you rate the usefulness of the instructional material in the teaching/learning process?	Extremely useful	Very Useful	Somewhat useful	Slightly Useful	Not Useful
Total	10	31	3	1	0
MEAN	**4.02**				
Qualitative Description	**Very Useful**				

Table 5 shows the perception of the respondents on the use of instructional material for the Computer Organization course. The instructional material is **Very Useful** or grand mean of four and zero-two (4.02). It implies that the lessons included in the instructional material arebeneficial to the student understand the topics in Computer Organization. Hence, the student finds the instructional material as engaging, encourages independent learning and effectiveness.

Nevertheless, the use of the instructional material as perceived by the teachers and students influence the effectiveness of teaching and learning process. It helps the student improve their performance and develop skills[28]. Moreover, in the study of [22] the students expressed high perceived usefulness of video-based instructional materials in learning practical skills in block laying and concreting. The learners also found the documents relevant, useful, enjoyable, and exciting and would recommend them to their fellow students to use.

Table 6: Descriptive Statistics

	Mean	Std. Deviation	N
Utilization	3.9565	.84213	46
Usefulness	4.1111	.61134	45
llContent	4.2337	.41485	46
InstDesign	4.1465	.43861	46
Assessment	4.4843	.36543	46

Table 7: Correlation between the perception of the students and the effectiveness of instructional materials

		Utilization	Usefulness	Content	InstDesign	Assessment
Utilization	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	46				
Usefulness	Pearson Correlation	.448**	1			
	Sig. (2-tailed)	.002				
	N	45	45			
Content	Pearson Correlation	.325*	.209	1		
	Sig. (2-tailed)	.028	.169			
	N	46	45	46		
InstDesign	Pearson Correlation	.346*	.416**	.600**	1	
	Sig. (2-tailed)	.018	.004	.000		
	N	46	45	46	46	
Assessment	Pearson Correlation	.263	.310*	.439**	.625**	1
	Sig. (2-tailed)	.077	.038	.002	.000	
	N	46	45	46	46	46

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Correlation between Utilization and Usefulness

The result indicates that there is a significant relationship of instructional materials at 0.01 level of significance between utilization (*M= 4.0, SD = .84)* and usefulness (*M= 4.1, SD = .61).* A Pearson's *r* data analysis revealed a moderate positive correlation with *r* =. 45.It implies that the usefulness of having instructional materials that guide the students and teachers in the learning and teaching process should not be understated. However, using developed instructional materials, assists the teacher

economically and also allows student interaction. It makes student use their intellectual ability during learning and teaching processes[12].

Correlation between Usefulness and Content

However, there is no significant relationship between usefulness and content as perceived by the students. It implies that that student uses different resources to access the lessons in Computer Organization. Students have access to the internet wherein they can search the experiences using various search engines or watch YouTube videos for tutorials. Students acquire knowledge in the lessons taught with different instructional material to help better understand the topic[12]. The student does not only learn a lesson from the developed instructional material but is supported that instructional media sources (films, videos, news stories) help students to develop quantitative reasoning[29].

Similarly, students use the content because the structure or design of the instructional material promotes independent learning wherein lessons, activities, chapter quiz are integrated into the IM.Additionally, materials must be directly relevant to the content of the lesson andthe teacher's whole approach,and subject presentation is integrated[13]. In teaching the computer organization course, it is highly recommended to use videos and films, and the teacher may not only depend on the IM's but also utilized or introduced other types of resources that are likable to the student to learn the course.

Correlation between Usefulness and Instructional Design

The result indicates that there is a significant relationship at 0.01 level of significance between usefulness (*M= 4.11, SD = .61)* and InstDesign (*M= 4.1, SD = .44).* A Pearson's *r* data analysis revealed moderate positive correlation *r* = .42. It implies that in the development of the IMs there must be a system that is being observed to implement the teaching principles into the instructional plan. Following the ADDIE model wherein the needs assessment was conducted to identify the problem of the students enrolled in the Computer Organization course as well as defining the goals and objectives of the course.Self-paced lessons were observed to encourage the student to learn the materials at his/her on pacing. Tests at the end of each chapter are provided to assess the knowledge of the students based on the lessons. It denotes that instructional design used is appropriate to help the students understand the lessons in Computer Organization.Moreover, the instructional design must be learner-centered and goal-oriented that measures the skills and knowledge of the students[30].

Correlation between Usefulness and Assessment

The result shows that there is a significant relationship at 0.05 level of significance between usefulness (*M= 4.1, SD = .61)* and Assessment (*M= 4.5, SD = .37).* A Pearson's *r* data analysis revealed moderate positive correlation *r* = .31.Assessment tool plays a significant role in the academic performance of the students, wereteacher can get information on whether students accomplished the goals and objectives of the course[31]. Assessment should be made available at the end of each lesson to test the learning of the students.Additionally, assessment should match challenging subject matter standards and serve to represent the knowledge and learning in each discipline[32]. It implies that students use the assessment to test their cognitive skills by answering the chapter quiz at the end of the lessons. It means that assessment is applied not to recall past teachings, but to showcase the ability of them to employ knowledge in a real-world situation. Evaluation should focus on what students need to be learned. Likewise, evaluationof the practicalassessment is on the ability of the student to demonstrate and apply the knowledge and skills in computer. Example, if we want our student to become a programmer, performance-based assessment should be applied rather than using paper-pencil test. Giving a student a written examination that will recognize the different programming skills does not promote higher order thinking skills. More hands-on activity/exercises must be given to the student demonstrate and apply of their programming skills in the actual condition.

IV. CONCLUSION

Therefore, as a result, shows that the development of instructional material is advantageous and useful in the teaching/learning process to help the students understand the topics in Computer Organization. It is understandable that in the development of IM's it should identify the student needs and course objectives before the development of IM. Teachers should ensure that the created IM's should promote a different learning style and it should be congruent with the course syllabus and promote learner-cantered approach. The developed instructional material should be attuned to the course objective and encourage students to work independently. However, teaching the course does not only depend on the developed IM. Instead, teachers should open doors to utilize other forms of instructional materials. It supports the statement of Donkor (2011) using video-based instructional material also enhanced student learning and this could ignite their interest in learning the course. However, utilization of IM's should always be done in the classroom to maximize the benefit of having IMS.

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