The Effectiveness of a Work-text in Logic for College Students

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ABSTRACT

The primary purpose of this study was to determine the effectiveness of a work-text in Logic Descriptive and true-experimental research designs were used. The participants included the selected private colleges and university in CaLaBaRZon. The instruments included the achievement test, a work-text in Logic, and a survey questionnaire. The T-test for dependent and independent variables, weighted mean, standard deviation and percentage were used in treating the test results and assessments of the respondents. Based on the findings, the developed work-text is a valid instructional material providing student performance improvement from 58.01% (pretest score) to 94.07% (posttest score). Testing the effectiveness of the work-textrevealed a significant difference between the performances of the students. Students taught using the work-text had 91.27% performance compared to 79% performance of the students taught using the traditional method. It is recommended that faculty and students use this work-text to facilitate the teaching-learning process of Logic.

Introduction

Teaching is essentially a communication between the teacher and the students. In the past, teaching depended entirely on oral communication. Although this kind of communication continues to play an important role in the teaching process, current educational practice recognizes the value of a growing number of instructional materials as aids to effective communication and, in turn, to effective teaching and learning. Instructional material in the teaching-learning process is significant throughout the delivery of educational programs. According to Escala (2009), many practical outcomes can be achieved when high quality instructional material is used as a means to direct instruction. Moreover, in TIMSS 2003,the National Research Coordination Office claimed that a well-developed instructional material is more effective in the transfer of knowledge. Not only does it enhance the performance of students, but it also helps them increase their interest and love for the subject. Lodronio (2004) proved that even if the teacher is capable enough to handle the class, his technique must be accompanied by good tools to facilitate learning.

With the need for efficient materials in different fields, the researcher used a new tool – work-text to foster learning, interests, and needs of the students. Cabuyao (2011) pointed out that the contents of the work-text aligned to their passion and interest may address their cognitive needs of the students that are aligned with their passion and interest. According to Telus (2008), work-text is designed to suit the course rather than the course being designed to fit the text as what is usually done in some courses. Castaniares (2006) even stressed that the advantage of a work-text is that the student is able to insert additional notes or examples into appropriate location with blank spaces intended for this purpose so that notes (workbook) and text (textbook) are completely integrated. The materials are also printed which allows students to make notes or comments in each lesson.

Since there are few Filipino Logic authors, the illustrative examples provided are not on situation from the learner's socio-cultural milieu. Logicians, according to Pasigui (2002) are not only born; they are also madewith the environmental factor greatly contributing, hence, the need to relate the lessons to the learner's milieu. The topics written by foreign authors are not explained in simple language, which is easily understood by learners. As observed, Logic textbooks are not done for easy comprehension of the lessons by the average college student. In short, the topics and logical exercises are not presented in a way that adapts to the Filipino frame of mind in the hope of motivating the student. Thus, many students perceive the course as difficult which discouraged them to learn the concepts.

Purpose of the Study

The primary purpose of this study was to determine the effectiveness of a work-text in Logic in selected private colleges and universities in CALABARZON for the Academic Year 2011-2012.

Specifically, it aims to:

1. develop a wok-text in Logic;
2. validate the usefulness of a work-text in Logic;
3. determine the effectiveness of the developed work-text.

Methodology

The need assessment, construction, validation, interview, test for effectiveness and relevance of the work-text are presented in Figure 1. The first frame shows the input, which consists of the need assessment questionnaire. The next frame illustrates processing composed of developing need assessment questionnaire, construction of the Table of Specification, development and validation of achievement test, development and validation of a work-text in Logic, personal interview among students, development and validation of relevance questionnaire, test for effectiveness, distribution of relevance questionnaire and lastly, personal interview among students. The last frame is the output, which is the effective work-text in Logic for selected private colleges and universities in CALABARZON.

Research Design

This study is focused on the construction, validation, test for effectiveness and relevance of a work-text in Logic. The researcher made use of the descriptive and true-experimental research design.

Instruments

The researcher prepared an achievement test, a work-text in Logic, and a survey questionnaire to determine the effectiveness of the work-text.

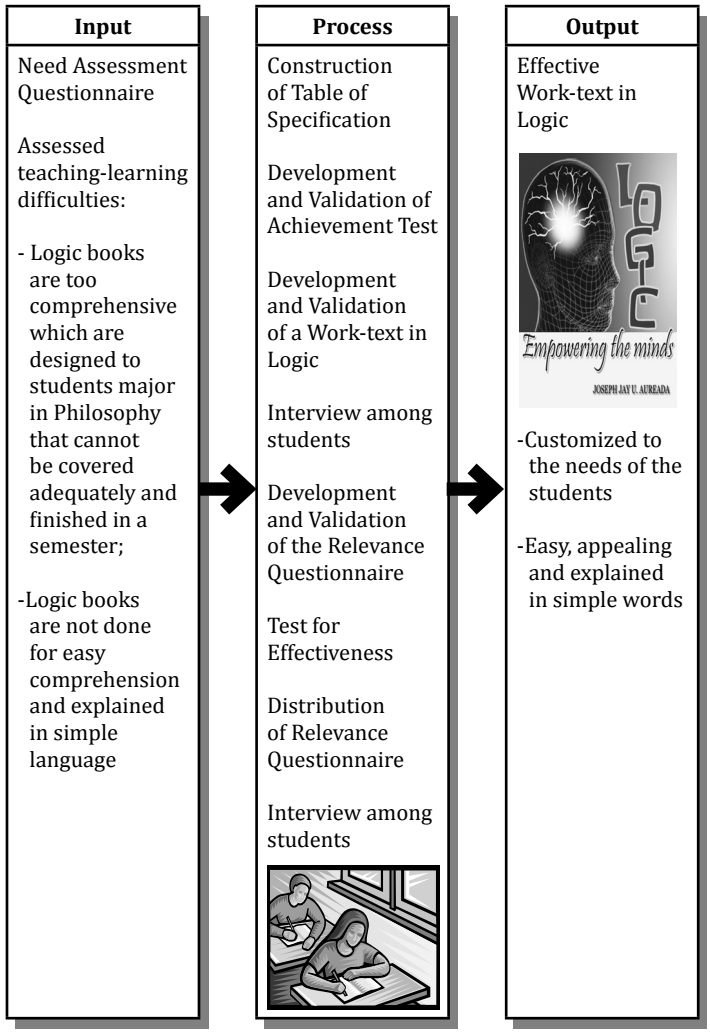


Figure 1: A Modified Input-Process-Output of Testing the Effectiveness of a Developed Work-text in Logic for College Students.

Achievement test

A content-validated test consisting of 50 items in administered every period of prelim, midterm and finals. This validation happens only through item analysis. The results were subjected to quantitative item analysis using the higher 50% and lower 50% of the students arranged from highest to lowest. The results were item analyzed. Items that did not pass the analysis were rejected while items that appear ambiguous or unclear were revised accordingly.

Work-text in Logic

This instructional material in Logic is a combined workbook and textbook which includes features that may develop the student skills in logic and motivate students to learn the subject matter. It also includes enhancement materials with varied exercises.

Survey questionnaire

This instrument is a Likert-scale questionnaire used to ascertain the relevance of the work-text as to structure and layout,

objectives, introduction, content material, summary or review, exercise and activity.

Participants Needs Assessment

The respondents who answered the need assessment questionnaire were four (4) faculty and fifty-two (52) students from San Pablo Colleges, De La Salle Lipa, and St. Anne College Lucena, Inc. No sampling method was used for they were the present students during the conduct of the study. Specifically, twenty-two (22) 3rd year AB Political Science students, nineteen (19) 3rd year BS Nursing students, and eleven (11) 2nd year students of Graduate in Midwifery.

Development of the Work-Text

The researcher carefully arranged the sequence of the topics so that the students would be guided on how to use the material properly. The researcher read textbooks, visited the library and browsed the internet during the construction of the work-text. After that, the researcher consulted his co-Logic professors for comments and suggestions. Revisions have been made. Then he presented it to his adviser until the work-text was constructed.

Validation of Work-Text

The respondents for the validation of this study were 106 college students from one class in every school from selected private colleges and universities in CALABARZON, who were enrolled in the Logic in the 1st semester of A.Y. 2011-2012. In the 2nd semester of the same year, the experiment proper was done in San Pablo City with 54 BS Mass Communication students who were divided into control and experimental group to test for the effectiveness of the work-text. The respondents who answered the need assessment questionnaire were 4 faculty and 52 students from the colleges of San Pablo City, Lucena City, and Cavite City. Complete enumeration was used as sampling technique for this study.

Evaluation of Work-Text

Before the study was conducted, the researcher submitted a letter of request to the Dean of San Pablo Colleges, San Pablo City to obtain the names and grades of the students who were part of the experiment for the match-pairing of the two groups. The respondents were fifty-four (54) first year BS Mass Communication students. No sampling method was used for they were the only students taking Logic subject in the said school. The Grade Point Average (GPA) in Philosophy of Man, Psychology and English obtained from the Collegiate Rating Sheet last first semester A.Y. 2011-2012 was the bases of grouping the students. The said three (3) basic subjects as the nearest subject in Logic were based on the Revised Bachelor of Science in Mass Communication Curriculum given by the dean of College of Arts and Sciences. The total population was fifty-five (55) where twenty (20) are males and thirty-five (35) are females. However, the population was reduced to fifty-four (54) to make the two groups equal. They were equally divided into two groups comprising twenty-seven (27) students for each group. The means and standard deviation of the two groups were determined whether they were equally distributed or not. Adjustment in groupings was done by members match-pairing. The researcher determined the composition of the experimental and control groups. After the match-pairing, the list of students was given to the concerned faculty.

Data Collection and Analysis

The researcher prepared and developed a work-text in Logic which is described as a functional instructional material designed to meet the needs of the students more adequately than traditional mode.

Before the development, the researcher conducted a needs assessment, constructed a table of specification (TOS), developed and

validated an achievement test, and designed a work-text in Logic.

The following steps were done to come up with the work-text.

Needs Assessment.

The researcher sought an official permit to conduct the study from the administrations of sampled schools for the distribution of the needs assessment questionnaire to faculty teaching Logic and to those students who have already taken the subject. The needs assessment survey included four faculty and 52 students from the colleges of San Pablo City, Batangas City, and Lucena City. Complete enumeration was used as sampling technique for this study.

The respondents were assessed if they have any problem or difficulty encountered in teaching and learning Logic. It was answered by yes or no. If the answer is yes, problems have to be specified. Afterwards, their suggestions on how to enhance teaching and learning of Logic were also asked.

Development of a Work-text in Logic.

The researcher carefully arranged the sequence of the topics so that the students would be guided on how to use the material properly. Using varied referenced, the researcher was able to draft the work-text. The researcher, then, consulted his co-Logic professors for comments and suggestions. Revisions have been made based on their recommendations.

Validation of a Work-text in Logic.

With proper correspondence, descriptive content and face validation was done by several content experts. All suggestions and recommendations were included in the revised version of the work-text.

The validated work-text was then utilized in the classroom of the selected private colleges and universities in CALABARZON.

During the 1st semester, the validation of the work-text was conducted in selected private colleges and universities in CALABARZON. The pretest and posttest method was employed to determine the validity of the material through the use of one-group pretest-posttest design. Achievement test in the form of pretest and posttest were used to validate the worthiness of the work-text.

After the validation on the first semester, the researcher collated comments and suggestions on the content of the work-text.

Results and Discussions

Development of a Work-text in Logic.

The work-text is an Aristotelian-Scholastic or a classical or traditional treatment of Logic. It is not meant for experts in the philosophical discipline of correct thinking, it is rather written for the learners who started exposure to the world of critical thinking. The researcher wishes that through the method and style he has adopted in the work-text - simple, yet rich and appealing, the students will find Logic as a subject that is not hard to understand and that eventually they can apply the inputs they learn in their journey towards their chosen path in life.

The researcher entitled the work-text, "Logic: Empowering the Minds" as a fruit of his seven-year experience in teaching Logic in college.

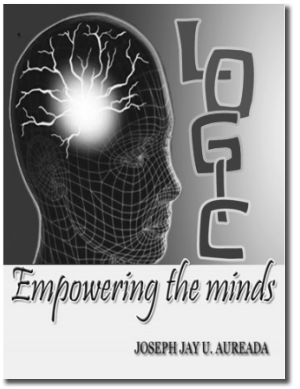
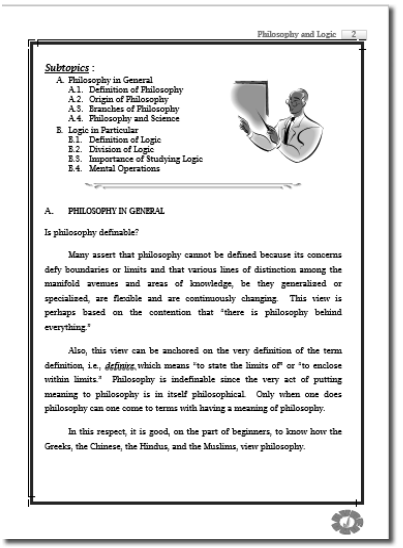


Figure 1. Title Page of the Work-text

The chosen topics follow the current Scholastic manuals treating syllogism as the basic structure of an argument. It divides the mental process into three phases: simple apprehension, judgment, and reasoning which account for the three linguistic "expressions," (namely): terms, propositions, and syllogisms. The six aforementioned lessons provided unique contribution to the learners' logic principles. Lesson 1 – Philosophy and Logic-- intended to help learners appreciate Philosophy through Logic. Lesson 2, 3 and 4provides processes of mental operation. The last part is Lesson 6 – Fallacy, which is considered as errors in argumentation. Every term has two Lessons.


Philosophy and Logic 2

Subtopics :

A. Philosophy in General
- A.1. Definition of Philosophy
- A.2. Origin of Philosophy
- A.3. Branches of Philosophy
- A.4. Philosophy and Science

B. Logic in Particular
- B.1. Definition of Logic
- B.2. Division of Logic
- B.3. Importance of Studying Logic
- B.4. Mental Operations

A. PHILOSOPHY IN GENERAL

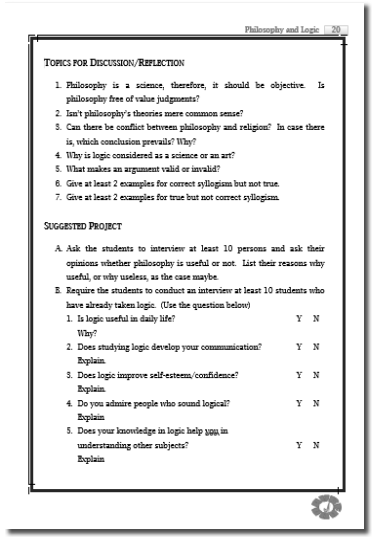
Is philosophy definable?

Many assert that philosophy cannot be defined because its concerns defy boundaries or limits and that various lines of distinction among the manifold avenues and areas of knowledge, be they generalized or specialized, are flexible and are continuously changing. This view is perhaps based on the contention that "there is philosophy behind everything."

Also, this view can be anchored on the very definition of the term definition, i.e., *defining* which means "to state the limits of" or "to enclose within limits." Philosophy is indefinable since the very act of putting meaning to philosophy is in itself philosophical. Only when one does philosophy can one come to terms with having a meaning of philosophy.

In this respect, it is good, on the part of beginners, to know how the Greeks, the Chinese, the Hindus, and the Muslims, view philosophy.

Figure 2. Discussion Content of Chapter 1


Philosophy and Logic 20

TOPICS FOR DISCUSSION/REFLECTION

1. Philosophy is a science, therefore, it should be objective. Is philosophy free of value judgments?
2. Isn't philosophy's theories mere common sense?
3. Can there be conflict between philosophy and religion? In case there is, which conclusion prevails? Why?
4. Why is logic considered as a science or an art?
5. What makes an argument valid or invalid?
6. Give at least 2 examples for correct syllogism but not true.
7. Give at least 2 examples for true but not correct syllogism.

SUGGESTED PROJECT

A. Ask the students to interview at least 10 persons and ask their opinions whether philosophy is useful or not. List their reasons why useful, or why useless, as the case maybe.

B. Require the students to conduct an interview at least 10 students who have already taken logic. (Use the question below)

1. Is logic useful in daily life? Y N
   Why?
2. Does studying logic develop your communication? Y N
   Explain.
3. Does logic improve self-esteem/confidence? Y N
   Explain.
4. Do you admire people who sound logical? Y N
   Explain
5. Does your knowledge in logic help you in understanding other subjects? Y N
   Explain

Figure 3. Content Activities of Chapter 1

The preliminary pages consist of the following: student's information, preface, acknowledgment, dedication, instruction, syllabus, and table of contents. Every lesson comprises of ten (10) main parts: (1) a list of Objectives which is provided to set the tone for what the students hope to accomplish; (2) Subtopics which will serve as an outline; (3) the Lesson Presentation which will provide narration of the topic lesson supported with lots of examples; (4) a brief summary of the Lesson; (5) an activity which is a rich store of individual or group tasks to assess student's learning (6) exercise for self-evaluation which is neither too short to lose the impact nor too long to make it tedious; (7) Topics for Discussion or Reflection; (8) Suggested Projects; (9) Suggested Readings; (10) the Note Pages after each Lesson for additional information and examples as well as the learner's reaction to the concluded discussion. At the last part, references and faculty guide for the answer key was also provided.

Validation of a Work-text in Logic.

Table 1 shows the summary of values between the prelim pretest and the posttest scores in validating the work-text in Logic in the five colleges in CALABARZON.

Table 1

Summary of Values for Testing Significant Differences between the Prelim Pretest-Posttest Scores in Validating the Work-text

College	Test	Scores		n	Mean	SD	t	Sig. Level
A	Pretest	H	16	16	10.00	3.14	24.70	.01
		L	5					
	Posttest	H	50	16	46.00	3.65		
		L	38					
B	Pretest	H	15	15	8.87	2.85	33.21	.01
		L	5					
	Posttest	H	50	15	45.60	3.50		
		L	39					
C	Pretest	H	14	27	8.52	2.34	36.28	.01
		L	5					
	Posttest	H	50	27	43.85	4.19		
		L	36					
D	Pretest	H	18	29	7.69	2.58	35.91	.01
		L	5					
	Posttest	H	50	29	42.55	4.40		
		L	33					
E	Pretest	H	12	19	8.89	2.00	34.95	.01
		L	6					
	Posttest	H	50	19	45.47	3.67		
		L	37					

Legend: H = Highest Score *n = number of respondent*
L = Lowest Score *t = computed t-value*
SD = Standard Deviation

As revealed, there is an increase of 36.00 points from the pretest mean score of 10.00 in college A; 36.73-8.87 (college B); 35.33-8.52 (college C); 34.86-7.69 (college D); and 36.58-8.89 (college E). Also, it shows that there is a difference between the pretest and the posttest scores of the respondents in the five colleges which are all significant at the one percent (1%) level. This result implies that the developed work-text in Logic in the prelim lesson is valid. It could be inferred that there is homogeneity of groupings in the respondents of all colleges.

This result further implies that the students improved their knowledge on Logic after the use of the work-text. Thus, there is a significant difference between the prelim pretest and the posttest scores of the students in using the work-text in Logic.

Table 2

Comparing the Prelim Pretest and Posttest Scores in Validating the Work-text

College	Pretest	Posttest	Gain
A	60.00%	96.00%	36.00%
B	58.87%	95.60%	36.73%
C	58.52%	93.85%	35.33%
D	57.69%	92.55%	34.86%
E	58.89%	95.47%	36.58%

As revealed in Table 2, all groups obtained an overall average of 60.00%, 58.87%, 58.52%, 57.69% and 58.89% in the pretest. The result showed that the gain difference between the pretest and the posttest percentage of colleges had an increase of 36.00%, 36.73%, 35.33%, 34.86% and 36.58% respectively. These percentages may be attributed to the learning they have acquired while they were using the developed work-text.

Table 3

Comparing the Pretest-Posttest Scores in Validating the Work-text

College	Test	Scores		n	Mean	SD	t	Sig. Level
A	Pretest	H	13	16	8.63	2.22	37.14	.01
		L	5					
	Posttest	H	50	16	44.94	3.53		
		L	39					
B	Pretest	H	13	15	9.40	1.55	58.04	.01
		L	8					
	Posttest	H	46	15	43.13	2.36		
		L	38					
C	Pretest	H	14	27	8.33	1.82	58.34	.01
		L	7					
	Posttest	H	44	27	41.15	2.70		
		L	36					
D	Pretest	H	13	29	8.55	1.72	54.16	.01
		L	6					
	Posttest	H	43	29	40.17	3.06		
		L	33					
E	Pretest	H	12	19	8.63	1.64	59.82	.01
		L	7					
	Posttest	H	43	19	41.32	1.67		
		L	39					

Domingo (2003), Rivano (2009) and Cabuyao (2011) reported the same text who validated their work-text using a group of students and found out that significant difference exists on the performance of the respondents in the pretest and post-test.

The table 3 shows that out of the fifty-item test, the mean score of students from College A who took the pretest was 8.63 and the standard deviation was 2.22, while in the post-test the mean score was 44.94 and the standard deviation was 3.53. The mean score of the students from College B who took the pretest was 9.40 and the standard deviation was 1.55, while in the post-test the mean score was 43.13 and the standard deviation was 2.36. The mean score of the students from College C who took the pretest was 8.33 and the standard deviation was 1.82, while in the post-test the mean score was 41.15 and the standard deviation was 2.70. The mean score of the College D students who took the pretest was 8.55 and the standard deviation was 1.72, while in the post-test the mean score was 40.17 and the standard deviation was 3.06. The mean score of the students from College E who took the pretest was 8.63 and the standard deviation was 1.64, while in the post-test the mean score was 41.32 and the standard deviation was 1.67.

The difference in the pretest and posttest mean scores of College A 36.31, College B 33.73, College C 32.82, College D 31.62 and College E 32.69 revealed at first glance that there is a difference in the performance of the students after being exposed to the work-text. It indicates that the students improved their knowledge in Logic.

Table 4

Comparing the Pretest-Posttest Scores in Validating the Work-text in terms of percentage

College	Pretest	Posttest	Gain
A	58.63%	94.94%	36.31%
B	59.40%	93.13%	33.73%
C	58.33%	91.15%	32.82%
D	58.55%	90.17%	31.62%
E	58.63%	91.32%	32.69%

Table 5

Comparing the Final Pretest-Posttest Scores in Validating the Work-text

College	Test	Scores		n	Mean	SD	t	Sig. Level
A	Pretest	H L	11 4	16	7.81	2.00	32.29	.01
	Posttest	H L	47 37	16	42.75	3.13		
B	Pretest	H L	13 5	15	7.80	2.76	23.61	.01
	Posttest	H L	46 32	15	40.93	3.97		
C	Pretest	H L	15 5	27	7.81	2.59	39.66	.01
	Posttest	H L	47 31	27	41.48	4.07		
D	Pretest	H L	14 7	29	8.41	1.59	48.20	.01
	Posttest	H L	49 35	29	41.28	3.13		
E	Pretest	H L	17 5	19	8.84	2.81	35.26	.01
	Posttest	H L	45 37	19	42.84	2.59		

As revealed in Table 4, all groups obtained a grand average of 58.63% (college A), 59.40% (college B), 58.33% (college C), 58.55% (college D) and 58.63% (college E) in the pretest. The result showed the gain difference between the pretest and posttest percentage of colleges had an increase of 36.31%, 33.73%, 32.82%, 31.62% and 32.69% respectively. It can be attributed to the learning they have acquired while they were being subjected to the work-text.

It could be inferred that the improvement in the student's performance was due to the work-text. This is supported by Villadiego (2003) and Bautista (2004) who revealed that a work-text could raise the achievement level of students. The significant difference of the pretest and posttest can be attributed to the learning they have acquired while they were subjected to the work-text. It indicates that the students improved their knowledge in Logic. Hence, there is significant difference between the midterm pretest and post test scores of the students.

Table 5 shows the level of performance of the students before and after the use of work-text in Logic. The significant increase in the test scores of the students indicates a better performance among them after they were subjected to the work-text. The students' improved performance may be attributed to the knowledge they have attained while using the instructional material. It may be pointed out that the work-text in Logic helped the students learn better about Logic.

As revealed in Table 6, all groups obtained a grand average of 57.81% (college A), 57.80% (college B), 57.81% (college C), 58.41% (college D) and 58.84% (college E) in the pretest. These results implied that the respondents had the same knowledge level before the conduct of the study. The result showed the gain difference between the pretest and posttest percentage of colleges had an increase of 34.94%, 33.13%, 33.67%, 32.87% and 34.00% respectively

Test for effectiveness of the developed work-text.

Table 6

Comparing the Final Pretest-Posttest Scores in Validating the Work-text in terms of percentage

College	Pretest	Posttest	Gain
A	57.81%	92.75%	34.94%
B	57.80%	90.93%	33.13%
C	57.81%	91.48%	33.67%
D	58.41%	91.28%	32.87%
E	58.84%	92.84%	34.00%

As revealed in table 6, all groups obtained a grand average of 57.81% (college A), 57.80% (college B), 57.81% (college C), 58.41% (college D) and 58.84% (college E) in the pretest. These implied that the respondents had the same knowledge level before the conduct of the study. The result showed the gain difference between the pretest and posttest percentage of colleges had an increase of 34.94%, 33.13%, 33.67%, 32.87% and 34.00% respectively.

Thus, these exist a significant difference in the test scores of the students before and

Table 7

Summary of Values for Testing Significant Differences between Pretest and Posttest Scores in Test for Effectiveness of the Work-text

Period	Group	Test	Scores		Mean	SD	Computed t-value	Sig. Level
PRELIM	Control	Pretest	H	23	14.59	4.96	15.60	.01
			L	7				
		Posttest	H	44	32.85	5.93		
			L	25				
	Experimental	Pretest	H	21	13.81	4.72	23.28	.01
			L	7				
		Posttest	H	46	41.78	3.08		
			L	35				
	Gain	Control			18.26	6.08	6.37	.01
		Experimental			27.96	6.24		
MIDTERM	Control	Pretest	H	20	12.56	4.66	12.52	.01
			L	6				
		Posttest	H	31	26.56	3.81		
			L	18				
	Experimental	Pretest	H	20	12.52	4.65	25.56	.01
			L	6				
		Posttest	H	46	42.37	3.01		
			L	36				
	Gain	Control			14.00	5.81	9.27	.01
		Experimental			29.85	6.07		
FINALS	Control	Pretest	H	24	13.00	4.86	11.34	.01
			L	8				
		Posttest	H	39	27.85	4.59		
			L	21				
	Experimental	Pretest	H	23	13.07	5.59	27.25	.01
			L	7				
		Posttest	H	44	39.67	3.05		
			L	33				
	Gain	Control			14.85	6.80	7.91	.01
		Experimental			24.72	5.99		

after using the work-text which implies that the developed work-text is valid. Hence, these findings confirmed the conclusion of Rivano (2009) and Escala (2009) that work-text as a kind of an instructional material is valid and acceptable by their respondents

Table 7 midterm coverage shows the comparison between the posttest mean scores obtained by respondents of the users and non-users groups. The posttests mean scores obtained by the users group have a very satisfactory performance with mean scores of 42.37; while the non-users post-test mean score is 26.56.

Table 7 final coverage shows the comparison of the highest score, lowest score, the mean and the standard deviation during the pretest and posttest of the control and experimental group. The experimental group shows that highest score obtained in the pretest was 23 and the lowest was 7 and; 44 and 33 in the posttest respectively. It also shows that out of 50 items, the mean score of the students in the pretest is 13.07 while the mean score in the posttest is 39.67. The control group, on the other hand, shows that highest score obtained in the pretest was 24 and the lowest was 8 and; 39 and 21 in the posttest respectively. It also shows that out of 50 items, the mean score of the students in the pretest is 13.07 while the mean score in the posttest is 27.85. The mean score 39.67 in the posttest was obtained by the experimental group and 27.85 by the control group.

As revealed in Table 8, the two groups obtained a grand average of 64.59% and 63.81% (prelim), 62.56% and 62.52% (midterm), and 63.00% and 63.07% (finals) in the pretest. Table 9 implied that the respondents had the same knowledge level before the conduct of the study. The result shows that the experimental group has a higher percentage than the control group (27.97%, 29.85% and 26.60% respectively). The gained percentage in the posttest of the experimental group indicated that the use of work-text in Logic is advantageous for the students.

Table 8

Summary of Values for Testing Significant Differences between Pretest and Posttest Scores in Test for Effectiveness of the Work-text in terms of percentage

Period	Group	Pretest	Posttest	Gain
prelim	control	64.59%	82.85%	18.26%
	experimental	63.81%	91.78%	27.97%
midterm	control	62.56%	76.56%	14.00%
	experimental	62.52%	92.37%	29.85%
finals	control	63.00%	77.85%	14.85%
	experimental	63.07%	89.67%	26.60%

Table 8 shown the comparison of the highest score, lowest score, the mean and the standard deviation during the pretest and posttest (prelim coverage). It shows that highest score obtained in the pretest was 23 in the control and 21 in the experimental group and the lowest was 7 in both groups. In the posttest, the highest score control group was 44 and that of the experimental was 46 while the lowest of the control was 25 compare to 35 of the experimental group.

It also showed that out of 50 items, the mean score of the students in the pretest of the control is 14.59 and 13.81 in the experimental group while the mean score in the posttest is 32.85 in the control and 41.78 in the experimental group. The result in the posttest shows that the experimental group has a higher mean with standard deviation of 5.93 than the mean of the control group with standard deviation of 3.08.

The mean performance of the posttest was subjected to t-test and yielded a t-value of 15.60 in the control and 23.28 in the experimental group which is greater than a tabular value of 2.479 at 0.01 level of significance. This result means that there is a significant difference between the performances of the students who were taught using the work-text in Logic than those who were taught using the traditional

method, which may imply that the students who were using work-text in Logic performed better compared to those students who did not use the work-text.

This finding strengthens the statements of Marino (2005) that when instructional materials like work-text are utilized in teaching the subject, better performance is expected among students.

The above studies concluded that work-text is effective in acquisition of knowledge. This creates a challenge for teachers and students if everyone is not presented with the same materials. Therefore, the null hypothesis, has no significant difference between the prelim posttest scores of the students in the control group and those of the students in the experimental group is rejected.

Work-text relevance among students based on structure and layout, objectives, introduction, content material, summary or review, exercise and activity.

Table 9 to 14 present the data on the assessment of the different aspects of the developed work-text in Logic. It is essential to know what questions to ask to ensure that the work-text in Logic will serve the purpose well. It is important to keep in mind a few points such as the ways in which the work-text is intended to function, and how students will react to them. The researcher presented criteria to judge the work-text. These criteria can be clustered under major sub-headings as follows: structure and layout, objectives, introduction, content material, summary or review, exercise and activity.

Table 9

Frequency and Weighted Mean Distribution of the Responses of the Students as to Structure and Layout

Criteria	4	3	2	1	WM	Descriptive Rating
A. STRUCTURE AND LAYOUT						
1. The material is visually attractive.	20	7	0	0	3.74	Strongly Evident
2. The material includes the requisite features of self-instruction, such as:						
-self-directed,	18	9	0	0	3.67	Strongly Evident
-self-motivating,	15	12	0	0	3.56	Strongly Evident
-self-learning,	15	12	0	0	3.56	Strongly Evident
-active-learning,	21	6	0	0	3.78	Strongly Evident
-individualized tutoring,	16	11	0	0	3.59	Strongly Evident
-updated content, and	19	8	0	0	3.70	Strongly Evident
-self-paced learning.	10	17	0	0	3.37	Strongly Evident
3. There is sufficient blank white space to write notes, answer self- assessment questions posed by the learning materials and exercises.	25	2	0	0	3.93	Strongly Evident
4. It is easy for learners to find their way backwards and forwards with the help of icons and signposts.	17	10	0	0	3.63	Strongly Evident
				AWM	3.73	Strongly Evident

Legend:	*Scale*	*Remarks*	*Range*
	4	*Strongly Evident (SE)*	*3.25 - 4.00*
	3	*Evident (E)*	*2.50 - 3.24*
	2	*Not Evident (NE)*	*1.75 - 2.49*
	1	*Not Strongly Evident (NSE)*	*1.00 - 1.74*

Table 10

Frequency and Weighted Mean Distribution of the Responses of the Students as to Objectives

Criteria	4	3	2	1	WM	Descriptive Rating
B. OBJECTIVES						
1. The objectives are stated in behavioral and measurable terms.	16	11	0	0	3.59	Strongly Evident
2. The objectives are specific.	20	7	0	0	3.74	Strongly Evident
3. The objectives are attainable within the allotted time frame.	23	4	0	0	3.85	Strongly Evident
4. The objectives give both the faculty and the students a sense of direction and purpose.	22	5	0	0	3.81	Strongly Evident
5. The objectives motivate the interest of the students.	15	12	0	0	3.56	Strongly Evident
				AWM	3.71	Strongly Evident

Table 9 shows the evaluation of the students on the level of the relevance of the work-text on structure and layout. It can be learned in the table that the respondents strongly agreed that the material is visually attractive; the material includes the requisite features of self- instruction, such as self-directed, self-motivating, self-learning, active-learning, active-learning, individualized tutoring, updated content, and self-paced learning; there is sufficient blank white space to write notes, answer self- assessment questions posed by the learning materials and exercises; and it is easy for learners to find their way backwards and forwards with the help of icons and signposts. These were evidenced by the composite mean scores of 3.74, 3.60, 3.93 and 3.63 respectively with the verbal interpretation of "strongly evident."

It can be learned in the table that the respondents strongly agreed that the material is visually attractive; the material includes the requisite features of self-instruction, such as self-directed, self-motivating, self-learning, active-learning, active-learning, individualized tutoring, updated content, and self-paced learning; there is sufficient blank white space to write notes, answer self- assessment questions posed by the learning materials and exercises; and it is easy for learners to find their way backwards and forwards with the help of icons and signposts. These were evidenced by the composite mean scores of 3.74, 3.60, 3.93 and 3.63 respectively with the verbal interpretation of "strongly evident."

The above findings testify the study of Abarro (2004), Sapalaran (2009) and Castaniares (2006) that instructional materials when properly prepared and used could accomplish the following: they supply a concrete basis for conceptual thinking and hence reduce meaningless word of learners; they have a high degree of interest for students; they make learning more permanent; and, they offer reality of experience which stimulates their minds

Table 10 presents the assessment of the students as to the relevance of the work-text on objectives.It could be deduced from the data that the respondents rated all the items on objectives as "strongly evident" as shown by the computed mean values 3.59, 3.74, 3.85, 3.81, and 3.56 respectively with an average weighted mean of 3.71.

The respondents perceived that the objectives based on the competency of the subject are relevant and properly stated. They are parallel to the learning contents, activities, and evaluation set by the author of the work-text. The result implies that the work-text in Logic is strongly evident on the relevance for the development of logical abilities of the students. The reason behind this fact lies in the sense that there is congruency on the evaluations among students.

Table 11

Frequency and Weighted Mean Distribution of the Responses of the Students as to Introduction

Criteria	4	3	2	1	WM	Descriptive Rating
C. INTRODUCTION						
1. It provides the students with enough information about the concept of the skills to be performed.	14	13	0	0	3.52	Strongly Evident
2. It gives the student the idea on what the particular activity is all about.	19	8	0	0	3.70	Strongly Evident
3. It indicates the prerequisite skills.	16	11	0	0	3.59	Strongly Evident
4. It arouses the student's interest to perform the activity.	18	9	0	0	3.67	Strongly Evident
5. It attracts/catches the attentions of the students.	17	10	0	0	3.63	Strongly Evident
				AWM	3.62	Strongly Evident

Table 12

Frequency and Weighted Mean Distribution of the Responses of the Students as to Content Material

Criteria	4	3	2	1	WM	Descriptive Rating
D. CONTENT MATERIAL						
1. It is readable and simple.	19	8	0	0	3.70	Strongly Evident
2. The content is relevant and adequate.	12	15	0	0	3.44	Strongly Evident
3. It is presented in personalized style using words such as 'I', 'you', 'we', etc.	16	11	0	0	3.59	Strongly Evident
4. The material is broken up into manageable chunks.	22	5	0	0	3.93	Strongly Evident
5. The material is prepared for all types of learners (good/ average/below average).	15	12	0	0	3.56	Strongly Evident
6. Contents are appropriate to the needs and abilities of the learners.	17	10	0	0	3.63	Strongly Evident
7. The learners enjoy reading the text.	13	14	0	0	3.48	Strongly Evident
8. Topics are properly organized based on the syllabus of the subject.	23	4	0	0	3.85	Strongly Evident
9. Concepts and information are sufficient to satisfy the needs of the learner.	16	11	0	0	3.59	Strongly Evident
10. Concepts and information are comprehensively presented.	20	7	0	0	3.74	Strongly Evident
11. Topics are harmonious with the desired learning competencies.	20	7	0	0	3.74	Strongly Evident
				AWM	3.66	Strongly Evident

This affirmed the study of Luistro (2008), Bautista (2004) and Daguman (2003) that, in teaching, objectives are very important in choosing the appropriate strategies and instructional material for it to become a worthwhile experience for the students and the teachers as well.

Table 11 shows the data on the assessment of the students on the Introduction of the developed work-text. It could be gleaned from the table that as perceived by the students, the relevance of the introduction of the developed work-text is strongly evident with computed mean values of 3.52, 3.70, 3.59, 3.67 and 3.63 respectively with an average weighted mean of 3.62 and interpreted likewise. This result means that the introduction in each lesson gives a clear overview of the lesson to be taken and it motivates the students setting their minds to the present lesson.

Table 13

Frequency and Weighted Mean Distribution of the Responses of the Students as to Summary or Review

Criteria	4	3	2	1	WM	Descriptive Rating
E. SUMMARY OR REVIEW						
1. The summaries or reviews are clear and useful.	15	12	0	0	3.56	Strongly Evident
2. The summaries or reviews provide useful ways for students to revise the material quickly and frequently.	17	10	0	0	3.63	Strongly Evident
				AWM	3.60	Strongly Evident

This conforms with the laboratory manual in Biology made by Lodronio(2004) where she also put introduction to every experiment conducted. Moreover, it is also similar to the work-text in Physics 2 developed by San Antonio (2007) where the introduction was placed at the start of every topic discussed.

Table 12 presents the computed weighted mean on the evaluation of the respondents with respect to content material. It can be gleaned from the table that as perceived by the students, the relevance of the contents of the developed work-text is strongly evident with computed mean values of 3.70, 3.44, 3.59, 3.93, 3.56, 3.63, 3.48, 3.85, 3.59, 3.74 and 3.74 respectively with an average weighted mean 3.66. This resultimplies that students in Logic considered the content comprehensible and with depth in presentation. It provides considerable knowledge, idea, and explanation needed for self-phase learning of the lesson.

These findings confirmed the conclusions of Vinoya (2001), Marino (2004), De la Torre (2008) and Tenido (2006), that the content must be arranged in a manner that it will be easy to understand the lessons. Information is sufficient to be understood. The materials used simple words and grammar. The lesson's jargons are explained in detail.

Table 13 shows the average weighted mean 3.60 on the evaluation of the respondents on the relevance of the developed work-text with respect to the Summary or Review. The overall findings show that there is congruency on the evaluation among respondents on the developed work-text. It can be deduced that the work-text contained the required characteristics that would really help in improving the performance of the students in Logic.

These findings were proven by Villamor (2003) and Rivano (2009) that a work-text must provide a summary of key messages or the most important issues of the lesson.

The table 14 presents the evaluation with respect to the exercises and activities of the work-text. The relevance of the work-text is strongly evident as perceived by the students with the computed weighted mean values of 3.67, 3.63, 3.85, 3.70, 3.56, 3.70, 3.78, 3.63 and 3.74 respectively with an average weighted mean 3.70. This implies that the reinforcement exercises and activities given in the work-text are found to be sufficient and adequate contributory to the understanding and performance of the students.

The table 14 presents the evaluation with respect to the exercises and activities of the work-text. The relevance of the work-text is strongly evident as perceived by the students with the computed weighted mean values of 3.67, 3.63, 3.85, 3.70, 3.56, 3.70, 3.78, 3.63 and 3.74 respectively with an average weighted mean 3.70. This implies that the reinforcement exercises and

Table 14

Frequency and Weighted Mean Distribution of the Responses of the Students as to Exercises and Activities

Criteria	4	3	2	1	WM	Descriptive Rating
F. EXERCISE AND ACTIVITY						
1. The developed work-text includes interesting and challenging activities.	18	9	0	0	3.67	Strongly Evident
2. Exercises and activities are up to date.	17	10	0	0	3.63	Strongly Evident
3. The developed work-text includes tests and other evaluative tools.	23	4	0	0	3.85	Strongly Evident
4. Exercises and activities are related to the content of the work-text.	19	8	0	0	3.70	Strongly Evident
5. Exercises and activities are useful in the classroom teaching.	15	12	0	0	3.56	Strongly Evident
6. Exercises and activities are fitted to the level of the students.	19	8	0	0	3.70	Strongly Evident
7. Instruction for learning activities is clearly presented.	21	6	0	0	3.78	Strongly Evident
8. Exercises and activities are varied for individual differences.	17	10	0	0	3.63	Strongly Evident
9. Exercises and activities are adequate for each lesson within the allotted time frame.	20	7	0	0	3.74	Strongly Evident
				AWM	3.70	Strongly Evident

activities given in the work-text are found to be sufficient and adequate contributory to the understanding and performance of the students.

This support to the research done by Villadiego (2003) and Bautista (2004) that instructional materials should contain strategies and tools for continually measuring student achievement. Where assessments are present in the supplemental materials, they provide sufficient evidence for teachers to evaluate student progress toward proficiency in the content outlined. Assessment strategies use established ways to measure effective learning and assess student progress by reference to stated learning objectives. All assessment tools are designed to be an integral part of the learning process.

Conclusions

The primary purpose of this study was to determine the effectiveness of a work-text in Logic in selected private colleges and universities in CALABARZON for the Academic Year 2011-2012. Theresearcher wishes that through the method and style he has adopted in this work-text - simple, yet rich and appealing, the students will find Logic as a subject that is not hard to understand and that eventually they can apply the inputs they learn in their journey towards their chosen path in life.

The developed work-text in Logic is described as a functional instructional material designed to meet the needs of the students more adequately than traditional method of teaching both with the quality of learning and the content. It will be an advantage to students and instructors in the field to make the teaching-learning process more motivating and effective.The work-text in Logic which is customized to the needs of the students, easy, appealing, and explained in simple words will help students achieve maximum use of their reasoning skills.

Recommendations

The policy on the use of the work-text is not tackled. Replicate studies are made in order to confirm the findings of the study and to external validity. The

topics are validated by the researcher in this study as well as other work-text in math be subjected to an in-depth evaluation to ensure the effectiveness and fitness of work-text tothe conditions of the learner. Since the abilities and needs of students are greatly considered in the development of the work-text, where examples and illustrations are contextualized, teachers should be encouraged to validate and develop work-text in their areas of concentrations.

Financial support shall be extended by the school administration on the publication of the instructional material. Teachers should be supported to undertake further research on the effectiveness of the work-text in improving the teaching learning processes.A revision shall be initiated before publishing the work-text. And lastly, submit the completed work-text to a copyright in compliance with the Intellectual Property Rights to prevent plagiarism.

More seminars-workshops and trainings should be conducted with regards to the development of instructional material for the instructors to be familiar and used to this kind of learning tool.

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