Industrial Technology Instructions at the Pangasinan State University

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Abstract. Because of the coordinated machinery of its colleges, a college education is regarded as an important catalyst of transformation. Education must address the main issues that occur as a result of these ongoing reforms. Educational structures must be rebuilt, and educational development must be quantitatively rebuilt to achieve outcomes on a large scale to face the demands of the times. This research aims to survey industrial technology, specifically in electronics technology instruction at Pangasinan State University (PSU), and its implications for ability growth, specifically to determine the level of achievement of the course content in Electronics subjects, the degree of effectiveness of the strategies used in skills development and instruction, and, the level of adequacy of instructional materials used in developing skills development in electronics instruction, the severity of the problems experienced in acquiring skills development in electronics and instruction, and the extent to which remedial steps are needed to minimize the problems encountered in acquiring skills development in electronics and instruction. The descriptive normative survey approach was used in the analysis. The questionnaire checklist, informal interview, and observation methods were used to collect data for this report, which was circulated to PSU freshmen and sophomores. The t-test regression analysis was used to assess if there was a substantial disparity in the expectations of freshmen and sophomores. The study's key results were that sophomores greatly outperformed freshmen in terms of course material in Electronics; The efficacy of the other methods was slightly higher among sophomores than among freshmen, and the degree of adequacy of the instructional materials used in skill creation in Electronics was reasonably adequate; the degree of adequacy of instructional materials on freshmen was not significantly higher than on sophomores in using it as a means of skill growth in Electronics, indicating that it is not important. The various difficulties faced in learning skills in Electronics Instruction are important; finally, sophomores performed slightly higher than freshmen when evaluating the above remedial steps. It was suggested that teachers recognize students' level of accomplishment in studying the course contents of Electronics Instruction; instructors should use a variety of techniques when teaching Electronics and should not go above the students' literacy stage. Electronics can be taught using a variety of educational resources; the teacher should pursue a solution to the problems experienced by taking into account the remedial steps suggested in this study; and ultimately, remedial measures should be introduced to minimize the problems encountered in teaching Electronics courses.

Keywords: Industrial Technology Instructions, Pangasinan State University, Electronics Technology. Skills Development.

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

INTRODUCTION

The world we live in is not the same as those in the previous decades, for changes have taken place and are still taking place everywhere. This requires a college education to make the necessary and needed adjustments. Because of the integrated machinery of its colleges, a college education is regarded as an important catalyst of transformation. Education must address the main issues that occur as a result of these ongoing reforms. Educational structures must be rebuilt, and educational development must be quantitatively rebuilt to achieve outcomes on a large scale to face the demands of the times. Individuals in charge of the education of college students must be retooled with skills useful in meeting the problems of change and conflict. The colleges and universities must develop new insights into human behavior, increasingly defined concepts of social change, including novel new methods that would improve learning outside the outcomes of previous training programs.

The journal article, text, or resource's brief narrative summary. A student who wishes to pursue a career in technology education must be particularly encouraged to integrate information technology into learning theories. Before the learning process, evaluation provides a point of reference for pupils. Once students have been exposed to practical electronics and computer equipment, the expert method can be introduced. Specifically, expert systems are computer programs that encode the knowledge of an expert and replay this information to the novice. An emerging area of expert systems is in education. Building expert systems in education consist of five interdependent activities; identification, conceptualization, formalization, implementation, and testing.

The instructors must possess an interest in the preparation of the college students to face challenges as well as the skills, attitudes, and values that have developed in the process. It is for this reason that the researcher program should divide the instruction time for the areas of experience into length, location, and sequence of periods that make possible effective learning. In other items, the program should be divided into few long periods thus allowing college students the time to participate in the types of activities that are profitable to them especially in doing technical activities such as projects. Since the length of time devoted to an area of the curriculum is an indication of the emphasis given, those parts regarded as the core of the program should presumably be given the preferential position in time allotment.

STATEMENT OF THE PROBLEM

This study aims to look into the Skill development in electronics instruction at the PSU–Lingayen Campus (LC), 1st Semester 2019-2020.

It is specifically aimed at answering the following questions:

1. What is the level of achievement in electronics course material for freshmen and sophomore students?
    a. Is there a noticeable gap in the degree of accomplishment of the course material of electronics as viewed by freshmen and sophomores?
2. How successful are the techniques used in skill creation in electronics instruction?
    a. Is there a substantial gap in the degree of success of techniques used in improving skills learning in electronics teaching as viewed by freshmen and sophomores?
3. What is the degree of adequacy of educational resources used for electronic ability development?
    a. Is there a noticeable variation in the degree of adequacy of educational resources used for electronic ability learning as viewed by freshmen and sophomores?
4. How severe are the problems faced in acquiring skills acquisition in electronics instruction among freshmen and sophomores?
    a. Is there a noticeable gap in the degree of severity of the difficulties faced in gaining skills acquisition in electronics and teaching as perceived by freshmen and sophomores?
5. What is the degree to which remedial steps are needed to alleviate problems experienced in acquiring skills growth in electronics instruction among freshmen and sophomores?
    a. Is there a noticeable gap between them is the degree to which remedial steps are needed to mitigate the problems faced in learning the skills development in electronics instruction?

NULL HYPOTHESES

The following null hypotheses influenced this study:

1. There is no statistically meaningful discrepancy between freshmen and

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

sophomores' expectations of the extent of accomplishment of course material in electronics.
2. There is no substantial variation in expectations of the degree of success of the techniques used in skill creation of electronics training between freshmen and sophomores.
3. There is no substantial variation in expectations of the degree of adequacy of educational resources used in learning basic electronics abilities between freshmen and sophomores.
4. There is no substantial gap in the degree of severity of the problems faced in learning the basic knowledge and skills of electronics education between freshmen and sophomores.
5. There is no substantial gap between freshmen and sophomores' views of the magnitude of the importance of remedial steps to alleviate the problems faced in obtaining the basic knowledge and skills in electronics instruction at the PSU– LC.

SCOPE AND DELIMITATION OF THE STUDY

The scope and limitations of this analysis are limited to the fundamental knowledge and skills in electronics instruction at PSU– LC during the first semester of 2019-2020. This study's populations were made up of 100 students, 50 of whom were freshmen and 50 of whom were sophomores. The data gathered is limited to the views of the two classes of respondents requested in the study's particular problems.

METHODOLOGY

The descriptive normative survey approach was used in this study's analysis. It is descriptive [1], [2] [4] [5] [6] in the context that it identified and investigated the current state of skill growth in electronics instruction at PSU–LC, 1st Semester 2019 2020.

Data Gathering Techniques

This researcher used a questionnaire to collect the evidence required to address the study's basic questions, which were supplemented and crosschecked by library testing and participant observation. The researcher studied questions from previous studies while developing the questionnaire. The researcher also conducted a thorough and meticulous investigation into the concepts of questionnaire design. The researcher created the instrument in collaboration with the specialist. The objects in the instrument were derived from the researcher's participation-observation readings and consultations with experienced individuals. Each respondent was instructed to complete the instrument by checking the things that corresponded to his or her answer. The researcher floated the questionnaire to the respondents with the help of all concerned. Upon retrieving, the researcher classified then tallied the questionnaire responses per group. The responses were tabulated, analyzed, and interpreted.

Validation of the Questionnaire

A dry run of the questionnaire was conducted among the Grade 10 electronics students at Pangasinan School of Arts and Trades. No comments or suggestions were made for the improvement of the questionnaire so the draft was finally prepared. The dry run revealed that the items were comprehensible. The responses of these groups were not included in the final data that were analyzed in as much as the locale of the dry run was different. Responses from the retrieved instrument for the dry run were tabulated, interpreted, and analyzed. Data provided were the basis for identifying replicated, ambiguous and vague items. From there, the improved draft was presented for comment suggestions to the experts for further improvement. These were inserted into the final draft of the questionnaire, which was sent to the respondents.

Treatment of Data

The data collected from the questionnaire were categorized, tallied, tabulated, evaluated, and interpreted. To display the data visually on tables, frequency distribution, percentage, and average weighted mean were used. A frequency spectrum is a table that shows how many cases fall into each group. For analysis, the responses were arranged according to the descriptive equivalent of each choice. The frequency spectrum was also used to mean the overall level of accomplishment of the course material in Electronics Student, the degree of effectiveness of the strategies used in developing the basic knowledge and skills in electronics instruction among freshmen and sophomore students, and the degree of effectiveness of the strategies used in developing the basic knowledge and skills in electronics instruction among freshmen and sophomore students, the adequacy of instructional materials used in learning basic knowledge and skills in electronics, the severity of problems experienced in acquiring Skills Growth in Electronics Instruction among freshmen and sophomores, and the degree to which remedial steps are needed to mitigate problems encountered in acquiring basic knowledge in electronics instruction among freshmen and

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

sophomores. The views of the two classes of respondents on the questions asked were assessed using a three-point scale. The weighted mean was calculated by multiplying the frequency of responses by the weight for each descriptive counterpart, then dividing the estimate by the number of respondents. To obtain the total weighted mean, the weighted means were applied and then separated by the number of items; a similar process was followed for all response frequencies. The t-test was used to assess if there was a substantial gap in expectations between freshmen and sophomores at PSU– LC. [3].

RESULTS AND DISCUSSIONS

The presentation, analysis, and interpretation of data were gathered from the freshmen and sophomores in the PSU– LC who serve as a primary source of data. The data was analyzed, illustrated in graphs, and discussed in detail.

Table 1 presents comparative statistics on the combined understanding of PSU freshmen and sophomores on the extent of accomplishment of the course material in electronics.

The overall average weighted mean for freshmen students was 2.04, which is moderately achieved in descriptive equivalent, while 2.54 was moderately achieved in descriptive equivalent for sophomore students. In descriptive equivalent, the tabulated average weighted mean was 2.29, which is moderately accomplished (MA).

The statistical treatment of data used was T – a test of significance. Where the data was computed and procured T-test values were 8.14 which was lower than the tabular T-test values of 3.055 with 12 degrees of freedom at a .01 level of significance. This is justified by the fact that there is a substantial gap in expectations of the degree of accomplishment of the course material in electronics between freshmen and sophomore students. As a result, the null hypothesis was dismissed.

Table 1
Comparison of Perceptions on the level of achievement
Of the Course Content in Electronics Achieved
Among the freshmen and sophomores
N=50 freshmen
N=50 sophomores

	Freshmen		Sophomores		Average	
	WM	DE	WM	DE	WM	DE
1.Identification of Electronics Component and its function	2.10	MA	2.52	MA	2.31	MA
2.Identifying Circuits	2.08	MA	2.34	MA	2.21	MA
3.PCB designing	2.00	MA	2.4	MA	2.2	MA
4.AM radio Assembly	2.06	MA	2.5	MA	2.28	MA
5.Amplifier Circuit Design and Assembly	2.06	MA	2.6	MA	2.33	MA
6.Digital Electronics	2.06	MA	2.78	MA	2.42	MA
7. Television Troubleshooting And repair.	1.9	MA	2.64	MA	2.27	MA
Overall Average Weighted Mean	2.04	MA	2.54	MA	2.29	MA

Legend:

t comp = 8.14
t .01, 12df = 3.055

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

Result = Significant
Decision = Reject H_o

Table 2 presented the collective perspectives of PSU freshmen and sophomore students on the success of the techniques used in ability learning and teaching.

So, the computed average weighted mean for the freshmen students having a 1.18 was slightly effective while for the sophomore students the computed average weighted mean was 1.71 with moderately effective as the descriptive equivalent. The tabulated combined mean was 1.45 having a slightly effective descriptive equivalent.

As indicated in the table with the use of T-test significance, the procured T-test value was 5.08 which was lower than the tabular T-test value of 3.355 with 8 degrees of freedom at a 0.01 level of significance. As a result, there was a substantial gap between freshmen and sophomore students' views of the efficacy of the methods used in ability learning and teaching at PSU.

As a result, the null hypothesis was ruled out. "There is a substantial disparity between the perceptions of freshmen and sophomore students on the degree of efficacy of the methods used in ability learning and instruction," said the null hypothesis.

Table 2
Comparison of Perceptions on The Degree of Effectiveness of the Strategies Used in Skills Development and Instruction among the Freshmen and Sophomores
N=50 Freshmen
N=50 Sophomores

	Freshmen		Sophomores		Average	
	X	DE	X	DE	X	DE
1.Lecture / Discussion	1.2	SE	1.5	SE	1.35	SE
2.Demonstration	1.28	SE	1.44	SE	1.36	SE
3.Problem solving	1.16	SE	1.9	ME	1.53	SE
4.Paper and pencil test/observation	1.12	SE	1.9	ME	1.51	SE
5.Others, please specify group activity	1.16	SE	1.82	ME	1.49	SE
Overall Average Weighted Mean	1.18	SE	1.71	ME	1.45	NA

t comp = 5.08
t .01,df8 = 3.355
Result = Significant
Decision = Reject H_o

In table 3 illuminates the comparative data on the combined perceptions of freshmen from sophomores students with regards to the level of adequacy in terms of textbooks and reference books, visual aid, chart,

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

chalkboard, modules, measuring instrument, electronic tools and equipment, overhead projector, internet, and others service manual in the Pangasinan State University.

Table 3
Comparison of perception on The Level of Adequacy of Instructional Materials used in Skills Development in Electronics among the Freshmen and Sophomores
N=50

Instructional Material	Freshmen		Sophomores		Average	
	X	DE	X	DE	X	DE
1.Textbooks and reference books	2.6	A	1.96	MA	2.3	MA
2.Visual Aid	2.68	A	1.98	MA	2.3	MA
3.Chart	1.36	NA	1.7	MA	1.5	NA
4.Chalkboard	1.2	NA	2.4	A	1.8	MA
5.Modules	1.4	NA	2	MA	1.7	MA
6.Measuring Instrument	1.4	NA	1.9	MA	1.7	NA
7.Electronic Tools & Equipments	1.36	NA	1.98	MA	1.7	MA
8.Overhead Projector	1.28	NA	1.8	MA	1.5	NA
9.Internet	1.4	NA	1.96	MA	1.7	MA
10. Other, Please specify service manual	1.36	NA	1.9	MA	1.6	NA
Overall Average Weighted Mean	1.60	NA	1.96	MA	1.78	MA

t comp = 1.79
t .01,df18 = 2.878
Result = Not Significant
Decision = Accept H_o

It is shown in the table that the computed and obtained T-Test value was 1.79 which was lower than the computed T-test value of 2.878 and 18 degrees of freedom and a significance rating of.01 This is to demonstrate that there is no substantial gap between freshmen and sophomore students' views of the degree of adequacy of instructional resources used in developing skills development in electronics teaching. As a result, the null hypothesis was adopted.

The degree of seriousness rated and relative values used were the same through with Table 4.

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

Table 4
Comparison of Perceptions on the Degree of Seriousness of the problems encountered in acquiring the skills development in electronics instruction among the Freshmen and Sophomores
N = 50 Freshmen
N = 50 Sophomores

Problems	Freshmen		Sophomores		Average	
	X	DE	X	DE	X	DE
1.Inadequate instructional material	1.32	NS	1.7	MS	1.51	NS
2.Limited time appropriate for lecture, discussion,& activity	1.4	NS	1.96	MS	1.68	MS
3. Strategies are insufficient for the development of course material.	1.36	NS	1.9	MS	1.63	NS
4.Lack of train instructor	1.36	NS	1.86	MS	1.61	NS
5.To expensive of tools and equipment	1.6	NS	1.9	MS	1.75	MS
6.Other, please specify discussion of a lesson	1.4	MS	1.86	MS	1.63	NS
Overall Average Weighted Mean	1.41	NS	1.86	MS	1.64	NS

t comp = 8.34
t .01, df 10 = 3.169
Result = Significant
Decision = Reject H_o

This table, Table 4, is concerned with the comparative statistics on the joint views of freshmen and sophomore students on the seriousness of the problems faced in gaining skills growth in electronics and instruction at PSU.

The tabulated average weighted mean for the freshmen students was 1.41 while 1.86 for the sophomore students and the combined weighted mean was 1.64.

The T – a test of significance was used as a statistical treatment of data. The tabulated T-test value was 8.43 which was higher than the obtained T-test value of 3.169
with 10 degrees of freedom at a .01 level of significance. This indicated a disparity in attitudes between freshmen and sophomore students about the severity of the problems experienced in acquiring the skills growth in electronics and instruction at PSU. As a result, the null statement, "There is a substantial

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

discrepancy between the views of freshmen and sophomore students on the degree of severity of the problems faced in acquiring the skills development in electronics and teaching at PSU," was dismissed.

Table 5b
Comparison of Perception on the Extent of Necessity of the Remedial Measures to Minimize the Problems Encountered in Acquiring the Skills Development in Electronics Instruction Among the Sophomore
N=50 Freshmen
N=50 Sophomores

Remedial Measures	Freshmen		Sophomores		Average	
	X	DE	X	DE	X	DE
1.Instructional Materials should be provided	1.4	SN	2.04	FN	1.72	FN
2.add more time for the course	2.2	FN	1.78	FN	1.99	FN
3.Apply effective and diverse methods	2.4	FN	1.5	SN	1.95	FN
4. Instructors should receive further instruction and advancement.	2.4	FN	1.9	FN	2.15	FN
5.Make use of indigenous materials	1.2	SN	1.28	SN	1.24	SN
6. Other, Please specify	1.4	SN	2.3	FN	1.85	FN
Overall Average Weighted Mean	1.83	FN	1.80	FN	1.82	FN

t comp = 0.12
t .01,df10 = 3.169
Result = Not Significant
Decision = Accept H_o

Table 5, illustrates the comparative data on the combined perceptions of the freshmen and sophomores students on the extent of the necessity of the remedial measures to minimize the problems encountered in acquiring the skills development in electronics and instruction in the PSU.

The figured out average weighted mean for the freshmen students was 1.83 while 1.80 for the students of the sophomore and the combined average weighted mean was 1.82.

In getting the accurate outcome of the combined perceptions of freshmen and sophomores students, a T-test of significance was used. The table's data were estimated, and the results were collected. The T-test value was 0.12 which is lower than the tabular T-test value of 3.169 with 10 degrees of freedom at a .01 level of significance. The data

ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)

proves that there was no significant difference between the perceptions of freshmen and sophomores students on the extent of the necessity of the remedial measures to minimize the problems encountered in acquiring the skills development in electronics and instruction in the PSU.

As a result, the null hypothesis was accepted: "There is no substantial gap in the attitudes of freshmen and sophomore students on the magnitude of the importance of remedial steps to mitigate the problems faced in learning the skills development of electronics and teaching.

CONCLUSIONS

Based on the findings laid, the following conclusions are hereby presented; Freshmen had poorly achieved the course contents in Electronics Instruction while the sophomores had moderately achieved, There was a significant difference on the level of achievement of the course content in electronics among freshmen and sophomores as perceived by themselves in the PSU, Both respondents believed that lecture/ discussion and demonstration are slightly effective in skill development and instruction while Problem solving; Paper and pencil test/observation; and others were believed to be slightly effective and moderately effective for sophomores, There was a significant difference on the degree of effectiveness of the strategies used in developing skills in electronics instruction among freshmen and sophomores except for using demonstration which is not significant, Both freshmen and sophomores have varying perceptions of the degree of adequacy of educational resources used in professional learning of Electronics. All the computed t on the level of adequacy of instructional materials except for chart is highly significant, and lastly, freshmen and sophomores had different perceptions on the degree of seriousness in acquiring the skills development in electronics.

There was a major variation in the severity of the difficulties faced when developing electronics skills. The respondents held varying views on the degree to which remedial steps were needed to mitigate the problems faced in obtaining the skills growth in electronics, and Except for the use of indigenous materials, which was negligible, there was a substantial gap in the degree of the need of remedial steps to alleviate the problems faced in obtaining the advancement of the skills of electronics.

RECOMMENDATIONS

The following suggestions are made based on the results reached; the instructors should consider the students' level of accomplishment in studying the course contents of Electronics Instruction. The instructors should use various methods in teaching Electronics and should not go above the students' understanding level. Electronics can be taught using a variety of educational resources. The teacher should suggest the remedial approaches suggested in this analysis to find a solution to the problems observed. Remedial steps should be taken to reduce the difficulties faced when teaching Electronics. As far as the school administrators are concerned, they should properly orient and supervised the teachers in teaching Electronics, finally, Seminar-workshops regarding Electronics should be offered not only to school administrators but also to the teachers.

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ISSN 2651-8414 (Print) www.psurj.org/mrj ISSN 2651-8406 (Online)