

# Acceptability of the Basic Electro-pneumatic Control Trainer

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## ABSTRACT

The standard electro-pneumatic control trainer offers students with instructional experience and understanding of the topic and course, as well as instructor presentations and assessments of student success through laboratory activities. The purpose of this research is to evaluate the acceptability of the newly developed basic electro-pneumatic control trainer. This analysis used the concept of descriptive research. After series of demonstrations, evaluation and assessment of the Bachelor of Industrial Technology (BIT) major in Electrical Technology, Electronics Technology and Mechanical Technology students and the faculty-experts from the College of Technology, Pangasinan State University (PSU) Lingayen Campus, the said utility model was rated by both student-respondents and faculty-expert-respondents “strongly agree” on all the criteria in the instrument which means it is very acceptable. With this trainer present in the shop-laboratory, learners can develop their expertise by accomplishing such tasks because it is along-side the real market of industrial process and control.

**Key words:** Electro-pneumatic control, Electrical Technology, Electronics Technology, Mechanical Technology.

## 1. INTRODUCTION

Electro-pneumatics were commonly employed in other fields of factory automation. Assembly, distribution, and shipping facilities all around the world. Such devices are operated by electro-pneumatic control systems. For electro-pneumatics, the pneumatic elements are operated using electrical and electronic circuits. Electronic and electromagnetic controls, electronic switches, and industrial computers are used to substitute the manual pneumatic device power [1].

As a tentative concept, Acceptability Engineering (AE) is the evaluation analysis and application of emerging technology designed to fulfill the approval of consumers and the development and testing of related hypotheses, methods, and phenomena. The goal of AE is therefore to obtain a healthy view of emerging technology and the acceptance of users. Also, it is the field in which study activities concentrate on bridging the divide between early and late adopters and between early and mature markets [2].

The Pangasinan State University–Lingayen Campus, in particular the College of Technology, is providing a Bachelor's degree in Industrial Technology (BIT) in nine (9) major fields of specialization, three (3) of which are primary elective programs for Basic Electro-Pneumatics, and these are Electrical Technology, Electronics Technology, and Mechanical Technology. Until then, the type of delivery of instructions in this elective course, basic electro-pneumatics, has been taught solely by definition, taking into consideration the reality that the topic has a laboratory unit portion. As a consequence, students who have taken up this elective subject will imagine electro-pneumatic systems through internet videos and later via their workshops and field trips to a variety of engineering and manufacturing firms. With an attempt to enhance the consistency of student learning results of BIT majoring in Electrical Technology, Electronics Technology, and

Mechanical Technology, the maker of the basic electro-pneumatic control trainer (Jeff G Pereyras, 2019b)[3] seeks to determine its acceptability to the students and the faculty-experts.

## 2. LITERATURE REVIEW

Through evaluating its acceptability, a low-cost electro-pneumatic automation trainer kit was built to be used as a teaching resource at Caraga State University (CSU) to teach industrial process and control in electrical engineering and technology courses, and maybe a more practical instrument to be utilized in industrial process and control laboratory subjects because it acts as a mock-up system to replicate the actual performances of students. Due to the costly laboratory equipment, the low-cost electro-pneumatic automation trainer kit has been employed to resolve the question of insufficient training facilities in State Universities and Colleges (SUCs), especially in industrial process and control courses. In such courses, the low-cost electro-pneumatic automation trainer kit offers high-quality instruction in industrial process and control laboratory technology without the usage of expensive and widely usable equipment. The Low-Cost Electro-Pneumatic Automation Training Kit equipped CSU with several incentives and advantages for effective students' instruction. It also assists the instructors and professors in the development of surplus instruments to be utilized as an instructional device and in the enhancement of the physical facilities of the

university. In specific, it allows learners to utilize this kit(Castillo, 2015)[4].

The electrical wiring installation trainer offers students with learning skills and knowledge of the topic and course, as well as instructors’ presentations and assessments of student performance during the laboratory period. This research made use of a developmental type of research. Demonstrating, interviewing and collaborating with faculty members of the College of Technology, Pangasinan State University (PSU) Lingayen Campus, Bachelor of Industrial Technology (BIT) Major in Electrical Technology, the stated utility model will carry out all the activities specified in the module in electrical wiring installation, which is parallel to the actual building wiring installation. The Industrial Design (ID) and Utility Model (UM) patents were given to an electrical wiring installation trainer by the Intellectual Property Office of the Philippines.(Jeff Galapon Pereyras, 2020) [5].

**3. OBJECTIVES OF THE STUDY**

The main objective of this research \was to determine the acceptability of the basic electro-pneumatic control trainer for use in learning industrial processes and control in BIT courses as an educational device.

**4. METHODOLOGY**

This analysis employed a descriptive research design. To determine the acceptability of the electro-pneumatic control trainer, the said trainer was demonstrated (Jeff G Pereyras, 2019a) [6] to the BIT majoring in Electrical Technology, Electronics Technology and Mechanical Technology students which serves as the student-respondents and to the faculty members of the College of Technology, Pangasinan State University (PSU) Lingayen Campus who handles the said industrial technology majors who serve as the faculty-expert-respondents. An instrument was adopted from the study of Castillo (2015) and was given to the respondents.

**5. RESULTS AND DISCUSSION**

This study was confined to just a simple evaluation and assessment of the developed basic electro-pneumatic control trainer for use in studying industrial processes and control in BIT elective subject as an educational device.

Using statistical means, the findings revealed that the aforementioned utility model was very acceptable based on the parameters set and is, therefore, an important educational resource and ready to be used to promote real learning experiences. The results of the demonstration, evaluation, and assessment of the performance of the utility model revealed the following findings where the response value description of the student-respondents and faculty-expert-respondents were shown in Table 1 and Table 2 respectively. Table 1 shows the result of the evaluation and assessment of the basic electro-pneumatic control trainer as perceived by the student-respondents and Table 2 shows the result of the evaluation and

assessment of the basic electro-pneumatic control trainer as perceived by the faculty-expert-respondents.

**Table 1:** Student-Respondents Evaluation Result

<b>Criteria</b>	<b>Mean</b>	<b>Descriptive Rating</b>
The trainer is easy to use and to operate	4.8	Strongly Agree
Learning objectives of the trainer are easy to understand and user friendly	4.77	Strongly Agree
The trainer is efficient in its operation	4.71	Strongly Agree
The trainer is convenient to use	4.68	Strongly Agree
The trainer has multiple applications	4.71	Strongly Agree
The trainer is based on industry standards	4.9	Strongly Agree
The trainer stimulates creativity thereby it add knowledge to the user	4.94	Strongly Agree
<b>Total Average Mean</b>	<b>4.79</b>	<b>Strongly Agree</b>

<b>Legend: Scale</b>	<b>Descriptive</b>
<i>Limits</i>	<i>Equivalent</i>
<b>4.51 – 5.00</b>	<b>Strongly Agree</b>
<b>3.51 – 4.50</b>	<b>Agree</b>
<b>2.51 – 3.50</b>	<b>Slightly Agree</b>
<b>1.51 – 2.50</b>	<b>Less Agree</b>
<b>1.00 – 1.50</b>	<b>No Agreement at all</b>

As evaluated by the students during their laboratory activities, the basic electro-pneumatic control trainer is easy to use and operate, the learning objectives of the trainer is easy to understand and user friendly, the trainer is efficient on its operation, the trainer is convenient to use, the trainer has multiple applications, the trainer is based on industry standards, and finally the trainer effectively stimulates creativity thereby it adds knowledge to the users, all these criteria were given a “Strongly Agree” descriptive rating which means the student-respondents accepts the utility model.

**Table 2:** Faculty-Expert-Respondents Evaluation Result

Criteria	Mean	Descriptive Rating
The trainer is easy to use and to operate	4.6	Strongly Agree
Learning objectives of the trainer are easy to understand and user friendly	4.6	Strongly Agree
The trainer is efficient in its operation	4.7	Strongly Agree
The trainer is convenient to use	4.5	Strongly Agree
The trainer has multiple applications	4.5	Strongly Agree
The trainer is based on industry standards	4.8	Strongly Agree
The trainer stimulates creativity thereby it add knowledge to the user	4.8	Strongly Agree
<b>Total Average Mean</b>	<b>4.64</b>	<b>Strongly Agree</b>

<i>Legend: Scale</i>	<i>Descriptive</i>
<i>Limits</i>	<i>Equivalent</i>
<b>4.51 – 5.00</b>	<b>Strongly Agree</b>
<b>3.51 – 4.50</b>	<b>Agree</b>
<b>2.51 – 3.50</b>	<b>Slightly Agree</b>
<b>1.51 – 2.50</b>	<b>Less Agree</b>
<b>1.00 – 1.50</b>	<b>No Agreement at all</b>

As assessed by the faculty-experts during the evaluation of the instructional device, the basic electro-pneumatic control trainer is easy to use and operate, the learning objectives of the trainer is easy to understand and user friendly, the trainer is efficient on its operation, the trainer is convenient to use, the trainer has multiple applications, the trainer is based on industry standards, and finally the trainer effectively stimulates creativity thereby it adds knowledge to the users, all these criteria were given a “Strongly Agree” descriptive rating which means the faculty-expert-respondents accepts the utility model. The findings of this research were parallel to the finding of the previous study of Pereyras (2020) entitled Acceptability and technical feasibility of an electrical wiring installation trainer [7].

**6. CONCLUSION**

In the common context, the basic electro-pneumatic control trainer was found to be very acceptable in terms of its architecture, efficiency, instructional capabilities and protection features, and its application by students and faculty-experts in the field of industrial process and control courses.

**7. RECOMMENDATIONS**

Within this research, the following ideas were suggested after an interview and consultation with the faculty-expert-respondents; the trainer is recommended to be used for the courses relating to Industrial Controls, and, for Income Generating Projects (IGP) purposes, the Pangasinan State University can mass-produce this trainer soon since it uses inexpensive and durable materials for its parts. It's a substitute for a high-cost industrial automation trainer kit. Pangasinan State University may also ask assistance from the technology business incubation centers for commercialization purposes [8].

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