

# The Computer Multimedia Instruction Package for Welding and Brazing

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**Abstract**—The objective of this project is to produce computer assisted instruction(CAI) for welding and brazing in order to determine the efficiency of the instruction package and the study accomplishment of learner by studying through computer assisted instruction for welding and brazing it was examined through the target group surveyed from the 30 students studying in the two year of 5-year-academic program, department of production technology education, faculty of industrial education and technology, king mongkut's university of technology thonburi. The result of the research indicated that the media evaluated by experts and subject matter quality evaluation of computer assisted instruction for welding and brazing was in line for the good criterion. The mean of score evaluated before the study, during the study and after the study was 34.58, 83.33 and 83.43, respectively. The efficiency of the lesson was 83.33/83.43 which was higher than the expected value, 80/80. The study accomplishment of the learner, who utilizes computer assisted instruction for welding and brazing as a media, was higher and equal to the significance statistical level of 95%. The value was 1.669 which was equal to 35.36>1.669. It could be summarized that computer assisted instruction for welding and brazing was the efficient media to use for studying and teaching.

**Keywords**—Computer Assisted Instruction, Achievement, Efficiency of the lesson, Evaluation

## I. INTRODUCTION

**I**N the present study was to develop a model to many students. The computer used in the study. Most have used the CAI (Computer Assisted Instruction), sometimes referred to as Computer Aided Instruction in an effort to bring the computer to use the medium of instruction. The computer is more flexible than other materials. A CAI is planning to create a multi-party cooperation and knowledge as educators, psychologists, computer scientists to develop better quality CAI. Educational technology is effective. In learning and teaching that offer both still and moving images as well as charts, graphs and text. In order to transfer knowledge in a manner similar to the virtual classroom the teacher is also a provocation. To stimulate the student's attention on the content, so I follow what is happening. I do not continue and indicating ways of learning to provide students a continuum and guidance. The new content to the next and the impulse response of the different theories related to learning, it is the consensus about what our response in terms of learning. [1-4]

Course of PTE 221 welding and sheet metal the course is one of the students and the department of production technology education in the second year of undergraduate training for technician level on study welding and sheet metal course.

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Students will learn the basic operations including the preparation of welding joint, shield metal arc welding, oxy-acetylene welding, brazing. Operations, including the use of sheet metal and the metal sheet cutting, folding, roll the seams and joints. Welding sheet metal course as was part of the basic skills training to the students. Learn how to use the means of coordination and welding sheet metal. For this reason, the project is thought to be a computer assisted instruction execution PTE 221 welding and sheet metal. The CAI was most effective teaching and learning. The study by the students themselves when in doubt as to the subject was able to repeat them more thorough understanding.

## II. METHODOLOGY

This research was to create a series of computer assisted instruction execution coordination and welding sheet metal work and welding and brazing. A study was to determine the effectiveness of the lesson and effectiveness of student learning.

### A. The content series of computer-assisted instruction

Scope and content related to welding. The main contents are safety in welding prepare welding joint oxy-acetylene welding shield metal arc welding and brazing.

### B. Population and sampling group

Population is the department of production technology education faculty of industrial technology education. The sampling group in this study was composed of 30 third years to study for the PTE 221 welding and sheet metal. The data analyzed of discrimination and the reliability of the test group 2, the sample used for the effectiveness of the lesson learning and achievement of students with learning, including undergraduate students.

### C. Variable study

The independent variables: Including a computer-assisted instruction in course PTE221 welding and sheet metal.

The dependent variable: The effectiveness of computer-assisted instruction welding and sheet metal. The effectiveness of computer-assisted instruction on welding and sheet metal followed the criteria 80/80. Achievement of learning students (Post-test) of the students increased significantly at 95 percent confidence level.

## III. EXPERIMENTAL RESULT

### A. The results of content analysis

The computer-assisted instruction learning was analyzed the company conducted a brainstorming to find a relevant topic and is associated with the welding and sheet metal in order to create a chart with the headings.

The content that is relevant to the preparation of a content network. The content of the lessons learned through the analysis of all five units.

Unit 1 is safety in welding.

Unit 2 is the position and welding joint.

Unit 3 is Oxy acetylene welding.

Unit 4 is Brazing.

Unit 5 is Shield metal

### B. The results of analysis exam.

The results showed the analysis to test the performance and achievement computer-assisted instruction. Has a multiple choice test with the objective-oriented behavior, with the option of 4 for 40 and all questions put to the test target department of industrial technology education, a student's third year 30 who studied the PTE 221 welding and sheet metal. Then exam used to determine the index of difficulty and discrimination indices of the test. The exam used analysis of the index of difficulty and discrimination indices of the test. It has exam can be used to determine the efficiency and achievement is the number 48 on the index, the difficulty is in the range 0.20 to 0.80 and the index of discrimination is higher than 0.20 and a selection test of 40 questions used as a test before. And after the sequential test of 40 questions and take a test during the course of five units.

### C. The reliability of test results

The results showed that the test has been test with the target audience is students in the department of production technology education to year 3 of 30 people who have studied the PTE 221 interface and sheet metal work. The result is used to determine reliability. The result was 0.98, which is equal to the test with reliability is very high.

### D. Analysis to evaluate the quality of the lesson

The results showed that the analysis results of the evaluation by experts, which is divided into two parties, the expert analysis of the content and computer media in a series of computer-assisted instruction. The experts evaluated the content of the media and the computer lessons.

TABLE I

THE QUALITY OF THE OVERALL COMPUTER LESSONS FROM THE EXPERTS

Specialist	Evaluation topics.	Average	Meaning
1. The content.	1. The content of lesson	3.00	good
2. Media lessons of multimedia computers.	2. Parts of the text. 3. Part of the picture. 4. Overview of the lesson.	3.53 3.33 3.27	good good good
<b>Sum (<math>\Sigma</math>)</b>		13.13	
<b>Average (<math>\bar{X}</math>)</b>		3.28	good

Table I shows that the quality of the content and media of the computer-assisted instruction of welding and sheet metal. It could be observed for an overall average of 3.28 as a CAI for welding and brazing. The lesson of quality criteria was that to test the effectiveness of lessons.

### E. The result with samples to determine the effectiveness of the lesson.

The series of computer assisted instruction for welding and brazing. The data test sample to determine the efficiency and achievement, which results in the table II.

TABLE II  
THE MEAN SCORES BEFORE, BETWEEN CLASSES AND SCORE AFTER SCORE

Number	Pre Test (d)	Learning (E1)	Post test (E2)	Difference (D)	Difference (D2)
	%	%	%	$(E_2 - d)$	$(E_2 - d)^2$
1	28	85	85	23	529
2	40	88	85	18	324
3	28	85	80	21	441
4	38	80	80	17	289
5	28	85	75	19	361
6	43	80	93	20	400
7	43	80	85	17	289
8	28	75	75	19	361
9	43	85	88	18	324
10	48	80	95	19	361
11	33	88	70	15	225
12	28	80	75	19	361
13	45	80	83	15	225
14	50	93	93	17	289
15	40	85	88	19	361
16	25	88	75	20	400
17	38	93	80	17	289
18	48	75	90	17	289
19	20	83	78	23	529
20	33	78	85	21	441
21	20	80	85	26	676
22	33	88	90	23	529
23	38	85	85	19	361
24	25	83	88	25	625
25	38	90	93	22	484
26	43	88	83	16	256
27	23	85	88	26	676
28	33	78	78	18	324
29	23	80	78	22	484
30	45	83	88	17	289

Table II shows that the analysis of data using the program. The Computer Assisted Instruction for welding and brazing. That has been created to test a sample of 30 such samples. Not been studied in previous lessons. And I learned a lesson that teaches welding and brazing work this out with the students before the test. During the test, and posttest this tests the students are learning all the lessons of five units.

The data analysis used to determine the effectiveness of the computer assisted instruction for welding and sheet metal. During the course of the tests showed that the 5 percent rate. During the course of the tests, the mean score of the 5 per cent and 83.33 % average score of 83.58 % compared with the performance of the learning set at 80/80 [5] a computer assisted instruction for welding and brazing. It is a computer-assisted instruction. Effective at 83.33 / 83.58, which is consistent with the rating criteria is set at 80 percent, which indicates that The Computer Assisted Instruction for welding and brazing. The real lesson of the series can be used in teaching it.

F. The results of hypothesis testing

When a Computer Assisted Instruction for welding and brazing. The lesson is that the performance of the benchmark set. Percentage is 83.33 / 83.58 and on the results obtained for the achievement of the sample. The Computer Assisted Instruction for welding and brazing created. It shows that The Computer Assisted Instruction for welding and brazing. The sample has a higher level of learning.

TABLE III  
 RESULT OF HYPOTHESIS TEST

Hypothesis	t-test for Calculate	t- Test for table at alpha 0.05
$H_0 (\mu_1 = \mu_2)$	35.36	1.669
$H_1 (\mu_1 < \mu_2)$		

Table III showed sets of assumptions. To the achievement of students by  $\mu_1$  is test score prior to  $\mu_2$  is the test scores after learning of the t to the calculated value is 35.36, and t from the table at 0.05, which is 1.669 when considering that the calculated t value is greater than t from the table. Thus, to reject the hypothesis  $H_0$  can conclude that hypothesis  $H_1$ . Students have more knowledge about it after a series of computer assisted instruction for welding and brazing. The significant level of 0.05 or a confidence level of 95% shows that the computer assisted instruction for welding and brazing, which made the learning more real and can be used.

IV. CONCLUSION

The result showed that the quality of the content and the medium of a computer-assisted instruction welding and sheet metal. It appears that the average quality of lessons was 3.28, which means that the computer-assisted instruction welding and sheet metal. The quality remained good effectiveness of the course is equal to 83.33 / 83.58 Learning the crisis (t-Test) were compared with the value at 35.36. (t-Distribution) in the level of significance at 0.05, which is equal to 1.669 which is greater than the calculated value of t, t in the table shows that the academic achievement of students is actually higher.

The results showed the evaluation and testing of the sample, which is a computer-assisted instruction. The lesson was interface of the welding and sheet metal in a good quality. Lessons are based on performance criteria. As a resulted, student achievement learning of students is actually higher.

The results showed that the computer-assisted instruction welding and sheet metal. That has built up the achievement of those lessons. This increase is a result of the media. The results of the studied and research as you can see that the media is very important for learning and teaching. It can also be observed have discussed the advantages of computer-assisted instruction as follows. [6]

- I. Computer-assisted instruction to increase students' motivation to learn. The study by the computer. It is strange and new experience.
- II. The color stripes that look like animated. The Sound of Music. Adds realism. And inspiring students to be eager to learn the exercises or activities.

- III. The ability of memory. Computer to record the score. And behavior of students to take the next step is to plan lessons.
- IV. The ability to store data. It can be used in the study individually as well. You can customize lessons to each student. And display the progress immediately.
- V. The program provides a lesson to students. To help slow learners. Able to meet their specific needs cannot rush. Do not be shy with other people and do not be shy when I asked the wrong questions.
- VI. To further extend the capabilities of the instructor. In the course closely. The data can be simple and easy to implement.

REFERENCES

- [1] T. Chalongs, *The Development of Computer Assisted Instruction*, Journal of Education. University 10, 2 (June-October): 84-100, 1997.
- [2] S. Taksina, , *computer education*, Bangkok, Education Publishing House, 1987.
- [3] Sallis, Edward, Jones, Gary, *Knowledge Management in Education*. London. Kogan, 2002
- [4] G. Harold Silvius, Estell H. Curry, *Managing Multiple Activities in Industrial Education*, Illinois:Mchnight & Mcknight company, 1971.
- [5] S.Bonchom, *preliminary research*, 2nd edition, Bangkok, suri vitaya public, 1987.
- [6] M.kidanan , *computer assisted instruction, audio-visual*. Department of the Faculty of Education, Chulalongkorn University. 1998.