CURRICULUM DEVELOPMENT FOR TRANSFER PROGRAM
COMPUTER AIDED DESIGN AND MANUFACTURING

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ABSTRACT: The objective of this research was to transfer technology in computer aided design and manufacturing, which is important in the manufacturing industry as it increases the speed of production and improve the quality of work. Three times of technology transfer were conducted with different curriculums. Besides, this research also aimed to compare the achievement of curriculum used for transfer technology in computer aided design and manufacturing. The results of this research showed that there were 25 participants. The evaluation result showed that the first curriculum gained the mean score of 2.44, meaning moderate to good levels; the second curriculum at 2.91, meaning good level; the third curriculum at 3.6 out of 5 points, meaning very good level. After the experiment, the third curriculum had the highest mean score. The participants: industrial and school personnel viewed that the third curriculum providing CNC training could increase the participants’ understandings about manufacturing process and command of computer aided design and manufacturing. The participants could learn more about manufacturing process sequence and command entering for accurate work.

Keywords: Computer-aided design and manufacturing, Curriculum, Transfer Technology,

1. INTRODUCTION

The current industrial design and manufacturing industries in the country, Thailand is developing towards industrial parts manufacturing medicines which require the knowledge and technology to improve the design and production personnel, which constitutes the main industry in developing countries in order to click. Designated to become industrial country production, but in the current competition for industrial design and manufacture, grows quickly as conditions change, technological. Complementary to our efforts to reduce waste and increase efficiency in the production process result in the design, calculation, production must be made correctly. So there is no need to bring computer technology in design and manufacturing (CAD/CAM), imported by supporting production to match demand, and from China to Thailand has supported the development of the fundamental manufacturing industry continued. Education institutions need to adapt to current conditions. [1] By supporting the development of production personnel to have the capability to design and manufacture using the computer aided design and manufacturing, personnel development. There are several institutions that are currently operates. Individual training and Development Institute has designed a training course and analysis of training that trained personnel have the ability and skills to respond to the real industrial sector. In this research, therefore, foresees the importance of curriculum used in training. What's the difference? and what curriculum, achievement, good personnel development industry, designed and manufactured by computer programs that aid in the design and manufacturing of CAD/CAM.

CNC [2] stands for Computer Numerical control system, Control the words, using computer control system. Makes it possible to manipulate the data that is entered into the system, NC. The product development and production process is supported by computer software. The name of this technology is CAx computer aided something. These software tools support the specific engineering activities. The help of the computer means different things. In case of manufacturing the CNC programs are generated by a CAM system, the CAE means the collection of every engineering analysis and calculation. The task of the CAPP is to generate a process plan for manufacturing. The CAQA [3] is the programming of coordinate measurement machines in general. The most often used abbreviations are the next

• CAD – computer aided design
• CAM – computer aided manufacturing
• CAE – computer aided engineering
• CAPP – computer aided process planning
• CAQA – computer aided quality assurance
• CAPPS – computer aided production planning and scheduling
• CAST – computer aided storage and transport

2. CAD/CAM/CNC CURRICULUM

Nowadays a computer comes in every section of every branch of engineering. In mechanical engineering, which involves the study of the behaviour of the system, the system of rigid. System, thermal and mechanical system of remote machines. To understand these things, there will be a lot more complicated when these systems are complex. In preliminary studies, we can use various PHP tools. But when we want to analyze the system closest to the truth, or related studies, both in the system of flow and heating systems. Various equations describing the behaviour is more complex and will no longer be calculated by hand. A computer program to help mechanical engineering therefore has a role in the current. The insurgency, these applications will start from the basis that similar programs using CAD [4] to create the workpiece shape, we currently need to be studied. The program helps in designing (CAD) will make it possible to create a piece of work in 3 dimensions, style, which will have a clear picture, and also facilitates in several parts that are designed to make the finished piece. Additionally, the program can also identify the workpiece collision with them. Make a design with greater accuracy. Then define the scope of the problem and the part's features, we study and then analyzed by program analysis, engineering properties of various systems, CAE, such as resistance to lateral forces or heat transfer occurs and when it must adjust to the appropriate format, it can return returned to editing in CAD programs and bring it back quickly.

For the sophisticated production facilities, which require a mechanical chakrotmong (CNC Machine) in this connection, the movement of the driver blade cutting the work piece will be written to control to cause a desired shape, but when more complex shapes. Programming by hand, it will be impossible. Program CAM, will take part in the programming, instead of people for such complex shapes.

The curriculum used to train technology transfer programs, computer aided design and manufacturing. Most of the course will focus on the use of CAD and CAM [5] program which is a program of the advanced training of qualified participants who has CAD become basic principles. In this connection, researchers hypothesized that if training courses in the field of content production using a computer controlled manufacturing will result in user satisfaction are trained per training courses, CAD and CAM more. Trial courses with a group of participants, both the industry and educational institutions. Therefore a list of participants in Appendix By researchers has scheduled training courses the course 3 Appendix b to use in the comparison results, training by all 3 courses are different, marketing and training period. As follows:

The objective of 1 course syllabus focuses on the use of CAD/CAM program design of three-dimensional workpieces, respectively, starting from the ket. To create a workpiece based on the principles of 3D Wireframe 3D workpiece handling. Final conversion Code by using the production CAM (Computer Aided Manufacturing).

The purpose of the 2 courses with an emphasis on training, understand the principles of design, writing a piece of work. Two dimensions and three dimensions. Understand the three dimensional parts with CAD/CAM programs and know how to read Code when converting Code with a computer program AIDS in the production of the last CAM experiment with automatic machinery.

The purpose of the 3 courses with an emphasis on training, understand the principles for creating two-dimensional and three-dimensional and understand Code conversion programs, CAD/CAM, along with description of reading Code and fix the Code before using automated machinery.

3. RESULTS AND DISCUSSION

Questionnaires, participants in each course. The number of people in the 25 participants 25 people selected participants from companies and institutions and archives questionnaire after completion of training, according to the form in the Appendix.

Courses that are one found that curriculum evaluation adequate levels and evaluation the Facilitator on the part of the course. 64 percent of their content is in adequate levels. 60% of the knowledge and skills that have been more adequate level. 60 percent of the content of the training expectations, adequate level. 60% practice consistent with the content of the lessons.

The two course, found that the assessment course and instructor is in the best part of the course. 80 percent of the knowledge and skills that get more and more appropriate training documentation is in class, and 60 percent of appropriate content and materials. The tool. The machine is suitable for training.

The three courses, found that the assessment course and instructor is in a very good level. In the section of the course, 76 percent of the knowledge and skills that get more and more appropriate course content is in a very good level and 68 percent adequate teaching materials and allows for easier learning, very good level.
Table 1 Results of the analysis in the overall evaluation of the curriculum / instructional materials.

<table>
<thead>
<tr>
<th>Course Evaluation</th>
<th>Evaluation 5 points</th>
<th>Translation Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum1</td>
<td>2.44</td>
<td>Adequate</td>
</tr>
<tr>
<td>Curriculum2</td>
<td>2.91</td>
<td>Good</td>
</tr>
<tr>
<td>Curriculum3</td>
<td>3.60</td>
<td>Very good</td>
</tr>
</tbody>
</table>

Table 2 Results of the analysis in the overall evaluation of the lecturer.

<table>
<thead>
<tr>
<th>Course Evaluation</th>
<th>Evaluation 5 points</th>
<th>Translation Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum1</td>
<td>2.57</td>
<td>Good</td>
</tr>
<tr>
<td>Curriculum2</td>
<td>3.00</td>
<td>Good</td>
</tr>
<tr>
<td>Curriculum3</td>
<td>3.58</td>
<td>Very good</td>
</tr>
</tbody>
</table>

4. CONCLUSIONS

From course technology transfer programs, computer-aided design and manufacturing, which is the technology of the advanced CAD/CAM program, used to help design and manufacturing, today many institutions and agencies have organized courses, technology transfer program, computer-aided design and manufacturing, most courses will focus on the characteristics of design and production, using the program as a primary. Researchers have provided a technology transfer project, a program of CAD/CAM 3 times to experiment with the use of technology transfer courses that researchers have a new design, which will affect the learning and understanding of the participants as well.

The study found that in the transfer of technology, the use of computer-assisted design and manufacturing, In the course the average 2.44 review-level 1 course at 2.91 average level 2 and good curriculum; 3 average 3.60 level good trial course at an average 3 most courses at the 3 participants from industrial sectors, eg, click. And education personnel, commented at the time that the 3 course in training content about CNC topics therefore Appendix. D will result in participants understanding of the production processes and the use of computer-assisted program, command, design and production, and to know the stage of the production process and enter the command, work order computer programs produced correctly.

5. REFERENCES


