Deevlopment Document

Chia-Sheng Chien

California State University, San Bernardino

Introduction

Training new engineers of Samsung digital lock in Taiwan is the purpose of this instructional project. In this project, topic is being focused on determining malfunctions. Specifically, helping new engineers to provide technology supports in order to solve customers' problems. Moreover, this material is presenting by website, so learners can read contents on their electronic devices at any place. Basically, the website is a self-instruction since learners review it and do practices by themselves through Internet. Here is the URL of this project

http://jasonetec.weebly.com/etec-644-project.html

Technological tools in this project

Weebly

This is web host which includes website builder. In other words, Weebly provides multiple items which may be needed in website designing. For example, text block, image, or video. Users are allowed to drag any items to put in their web page and show a draft immediately before the website is published. Further, users can publish the contents on Weebly directly, instead of seeking another web host. As a result, website builder is more convenient than traditional HTML website design since it n provides simple operation. Also, assisting users to make precise alignment of the contents.

Slideshow

Slideshow is one of items provided by web builder on Weebly. The feature of slideshow is that multiple images can be shown in sequence in one block. In this project, using slideshow can emphasize different key points on the same electronic circuit. Besides, when those images

are changing in short period time, the effect is similar to GIF animation which can present the importance of electronic circuit repeatedly and clearly for learners.

Movavi

It is a screen capture software which can record everything shown on the screen of laptop. When a presenter is teaching operation process of technologies, screen capture is an appropriate tool for making demonstrations. Orús et al. (2016) states that by using video teaching, "students had a positive attitude towards the exercise and perceived the learning experience as more productive and enjoyable than traditional learning experiences." Also, Merrill (2002) claims that "learning is promoted when new knowledge is demonstrated to the learner." Thus, in this website, instructional designer explain and show the process of how to draw electronic circuit in video in order to motivate learners to go deeper in this content.

PDF

According to target audiences' responds in analysis report, learners are prefer to have visual material to assist them in determining malfunctions since some locations may not have Internet signal for connecting website. Hence, instructional designer decided to create a PDF which is allowed learners to download in their electronic devices. Furthermore, flowchart-based learning "is able to visualize the solution development for a programming problem by converting the given problem statement" (Hooshyar et al., 2016). For this reason, instructional designer sort out a flowchart system of determining process on digital lock in order to help new engineers solve customers' problems rapidly.

The structure of navigation in this project

Based on learning objectives of this project, the main contents are organized in three sections. First, introducing main components; second, connecting the main components by circuit; third, utilizing the circuit to determine malfunctions. Additionally, in order to assess the effectiveness of the contents and provide feedback to learners, a webpage of test and contact information are included in this website. Besides, each page has clear buttons to link to next or the previous section for readers to review the prior contents.
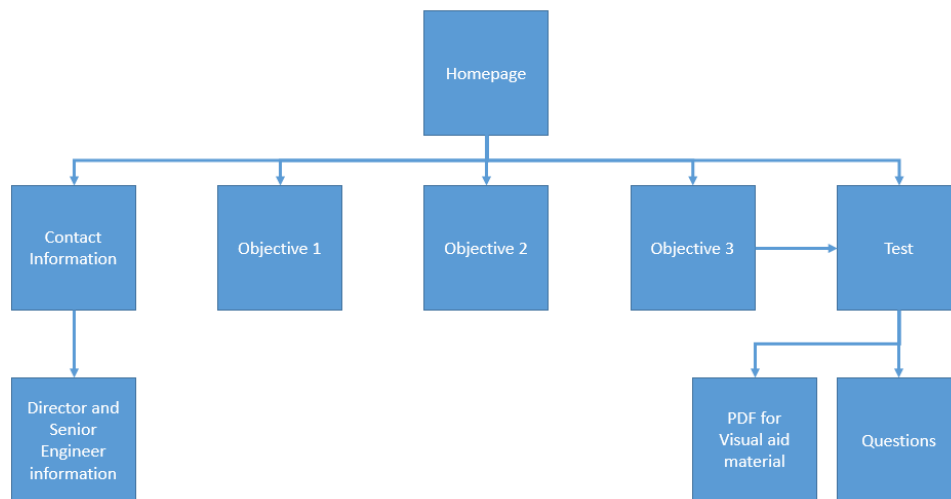
Home Page

To present the goal and learning objectives of this material. Also, learners can understand the overview of each sections by short descriptions below the linked buttons on home page.

Objective 1

Introducing the main components of digital lock. Since "the basic frame working constructing a teaching material is to divide the content into small items" (Arbin, Ghani& Hamzah, 2014), only seven components, which are primary controllers in digital lock functions, are selected and presented in this section for assisting learners to have basic concept at first.

Objective 2

After learners are able to explain seven main components, section 2 will guide them to connect each component by electronic circuit for defining the relationship among components. However, learners will "fail to understand new material if the content is sufficiently complex" (Sweller, 2002), so multiple images are used for clarifying the text of instruction for making a balance between text descriptions and image explanations in this section.

Objective 3

Once learners are able to describe the relationship among each component, the process of determining malfunctions will be much easier. Merrill (2002) states that "learning is promoted when learners are engaged in solving real-world problems." Therefore, based on repairing records from the past, instructional designer concludes four types of problems from clients, and use these problems to demonstrate how to determine errors by electronic circuit.

Assessment

Five questions which engineers encounter frequently are in this page. Learners respond all the questions and send their answers to instructional designer in answer box, so that the designer can evaluate the effectiveness of this website. Also, the visual material is posted on this page for assisting learners to accelerate their determining process.

Contact Information

The department director, senior engineer, and instructional designer's contact information are including in this page. The main purpose of providing contact information is to create a platform for learners and peers for reinforcing knowledge by discussing problems. Besides, learners can send their practices to instructional designer and get feedback through this page.

Instructional design theories in this project

Motivation Theory

Keller's ARCS theory is used in this project. First, attention. Using learning objectives and thought-provoking questions to inspire learners' interests. Second, relevance. Informing engineers that how this knowledge relate to their jobs. Third, confidence. Providing practice in each objective and giving feedback to learners. Finally, satisfaction. Helping learners to solve authentic problems in order to show the effectiveness of this knowledge.

Instructional Strategies

Merrill's first principles of instruction is used in this project. First of all, the topic of this material is determining malfunctions on digital lock which is an important skill for the target audiences of this project. Then, recall learners' prior knowledge which is electronic circuit concept to achieve the skill. Also, using video to demonstrate how to use electronic circuit to present the functions of digital lock. Finally, providing real-cases to learners for applying problem solving skill in this project.

Cognitive Load Theory

Sweller's cognitive load theory is utilized in main contents. Lots of text descriptions are necessary to be used for explaining electronic circuit. Thus, in order to prevent to overload learners' cognitive, instructional designer integrates text, images, and video to make learning more efficient.

Visual design principles in this project

Beriswell's ABC'RUS visual design principles is used for building this website.

Alignment: All titles and text are aligned vertical and left.

Balance: The images, slideshow, and text are making balance side-to-side.

Contrast: The background color is light, so black and bold fonts are used in the text. Also, some key words are presented by red in order to make it outstanding.

Chunking: Each page is divided in three parts, introduction, main content, practice, and each part is separated by dividers clearly.

Repetition: The style of each page and the fonts are consistent uses in whole website.

Simplicity: The main concept is electronic circuit, so every image and video is only focusing on the circuit instruction.

References

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