The Importance of Implementing Drupal in Instructional Design

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Abstract

Internet and mobile technology also enhances collaboration and communication between students and instructors. The teacher can easily receive and response their students' comments and give students feedback instantly, which can help students be aware of how they have learned and motivate them to learn. Students can also communicate with each other easily and help each other. Working with other people is an important skill for the 21st century. Especially for engineering students, collaboration is an essential skill to approach high learning performance because most of the time engineers need to collaborate with others as a team to work on projects. When students try to collaborate with their peer or teachers, they will have a better understanding about the knowledge. They will receive different thoughts about the same event and try to review and construct their original ideas. According to Vygotsky's social learning theory, knowledge is created through social interaction, a central role in the development of cognition ability. Internet and mobile technology provide learners more convenient opportunities to collaborate with other leaner. The problem is that some instructors do not have enough computer skills to create online learning environment for their student. Drupal is considered as the most popular and powerful open source content management platform in the world. Drupal provides them opportunity to build online learning environment easier and faster. In addition, introducing some new modules which can be utilized for online learning environment.

1 Introduction

Multimedia learning is becoming more and more useful recently. With the rapid development of technology, more and more web and mobile learning technologies have been employed in teaching and learning such as online games, virtual worlds, simulations, podcasts, online conferences, and so on. These technologies have greatly promoted the development of education and improved the effectiveness of teaching and learning. With the help of computer, internet, and mobile, distance learning have developed to a new stage-online learning. However, not all multimedia instructions are effective and efficient and not all instructors know how to apply multimedia learning theory in instructional design. How to organize picture, text, and video in design is an issue that cannot be ignored. In addition, some multimedia learning tools are not easy to learn and use, such as Lectora and website creation tools like Adobe Dreamweaver. Even though instructors

understand that a well-designed website is very beneficial for delivering instructional materials and helping student learn, they cannot spend tremendous time from their busy schedule to learn how to use these tools and design multimedia modules.

1.1 Organization

This paper includes two section. The first section focuses on what is social media networking and why we need social media networking in our teaching and learning. The second section pays attention on digital literacy which are going to cause the problems for instructors to design online learning course. The last section focuses on introducing some new online modules and demonstrate my personal website for teaching which was designed by using Drupal

2 Definitions and Background

2.1 Social Media Networking Technology

Media is defined as the means of communicating and transferring a learning concept to the learners. defined media as the replicable means, forms, or vehicles by which instruction is formatted, stored, and delivered to the learners[Sch77]. Currently, educators imply media as devices that provide learning experiences which involves sound, visuals, concrete objects, or actual physical movement. The media theory emphasizes on the learning that occurs as a result of using media and attempts to explain how the learning occurs when instruction is delivered via media. Sometimes, a medium can carry another medium. An example given by McLuhan is that a television (one form of media) carries the spoken word (another form of media) of the thoughts of a person[McL64]. The second medium can be in different forms rather than the spoken word, for example, it can change to draw, act, or write the message.

Media selection and media use are the two major ways in which media is integrated into the Instructional design process. Just as we use different tones, gestures, loudness to communicate, different types of media should also be used in delivering instruction. There is no one media better than the other. A particular medium may be suitable for a particular situation, so selecting the appropriate media are important for the effectiveness of instruction delivery process. Media selection models either early models or recent models can be simple or complex, but they all involves explaining media's role in facilitating learning. Most media selection models address five factors: content, learner characteristics, instructional strategies, environment, and management. Stated that "media selection is basically a process of matching media and their attributes to the needs of the situation at hand"[RKT11].

Learning content is represented by the learning tasks. Learning outcomes serve as the basic for identifying the required instructional conditions. To select appropriate media, the characteristics of learners must be taken into consideration. For example, if the learner is not confident in using computer technologies, the learning content should not be delivered via computer. Instructional strategy was often viewed as being individualized in the early years. Viewing the strategy as one of Gagne's events of instruction is another standard way of interpreting instructional strategy in media selection. Instructional environment is also an important factor that influences designers to choose one medium over another. If the environment is not adapted to the use of a given medium, the medium should not be chosen.

The two major functions that media serve are: being a vehicle of instructional automation and being a means of bringing realism and interactivity into the learning environment[RKT11]. As the development of computer technologies and internet, computer-based media becomes the dominant role in instruction. Instruction is less restricted by location and time, and new instructional strategies emerged. Communication between teachers and learners can happen at

any time. The types of learning materials become more varietal. Video, audio, images and other forms of learning materials become the commonly used delivery methods.

2.2 Multimedia in Online Learning Design

Using multimedia in instruction can be helpful in making the instruction more effective, efficient and appealing; however, it does not mean that using multimedia can definitely improves instruction. There is a balance that instructional designers have to keep in mind when using multimedia. Adding multimedia to instruction should consider many factors - the knowledge level of the learners, the type of learning content, whether to use static or dynamic graphics, and so on[Jab12]. Richard Mayer's several multimedia principles explain how to best make use of multimedia to promote learning, which include the Multimedia Principle, the Contiguity Principle, the Modality Principle, the Redundancy Principle, the Coherence Principle, and the Personalization Principle[May01]. These principles provide great guidelines for instructors when considering integrating multimedia into learning.

With the rapid development of technology, more and more web and mobile learning technologies have been employed in teaching and learning such as online games, virtual worlds, simulations, podcasts, online conferences, and so on. These technologies have greatly promoted the development of education and improved the effectiveness of teaching and learning. With the help of computer, internet, and mobile, distance learning have developed to a new stage-online learning. Before computers, web, and mobiles, distance education was mainly through correspondence. The advancement of technology and internet made distance education faster, easier, and accessible to all.

2.3 Digital Literacy

The application of web and mobile learning technologies has dramatically changed the way of teaching and learning. Instructors now are facing a lot more strategy choices when designing courses. They need to decide which learning technologies should be integrated in teaching and how to do that. For example, they need to decide whether to use asynchronous or synchronous communication style, whether to add videos in course materials or present only in text, and so on. Using these strategies can improve the effectiveness of teaching and learning, however, instructors are also facing a lot of challenges. First, technologies can hurt learning if they are used inappropriately. For instance, adding pictures, audios or videos can make the course appealing to students, but if these materials are irrelevant to the learning objectives, students would be distracted from what they should learn. The second challenge is the technology inequality. Not everyone can catch up the pace of technological advancement, and the gap which is divided into two forms including digital divide and technology gap gets wilder faster. Instructional designers should take this factor into consideration when designing courses because students' learning and performance may vary with their technology abilities and their access to technology.

2.4 Collaboration Skill

Working effectively with other people is an important skill for the twenty-first century. When students collaborate with their peers or teachers, they develop better understanding and knowledge. They will receive different thoughts about the same topics and try to review and reconstruct their original ideas. According to Vygotsky's social learning theory, knowledge is created through social interaction, which plays a central role in the development of cognitive ability[Jab12].

Biggs (1999) emphasized the importance of teacher-student interaction in the learning environment, stating that students would achieve a better understanding of the knowledge they learned and know how to apply it as they interact with teachers. Discussion, feedback, and collaboration are the major interactions in the classroom. Glasersfeld pointed out that the advantage of encouraging discussion in the classroom is that it "contributed to the students' linguistic development and provided them with opportunities to witness the use of words in the context of the experiences to which they refer"(as cited in Tobin, 1994, p. 30). The process of discussion requires students to retrieve knowledge from their memory to make inferences or assumptions about the subject and helps them to align the knowledge within an existing knowledge structure. A student who joins in class discussion retains a greater portion of the material in memory (Biggs, 1999).

Rivard and Straw (2000) also found that discussion has a significant positive effect on learning. In their study, students were separated into four groups: control, talk only, write only, and talk and write. Students were given a pretest and a posttest to determine the effect of discussion. The results showed that "talk had a significant impact on the achievement and depth of understanding" (p. 114). Students who participated in the talk only and write and talk groups had higher performance than students in the control and write only group.

2.5 What is Drupal

Drupal can be a great solution for instructors who are trying to design multimedia lessons but struggling with complex multimedia learning tools. Drupal is an open source content management platform powering millions of websites and applications. Drupal can be used to build everything from personal blogs to enterprise applications. It contains thousands of add-on modules and designs to help users build any site they can imagine. Drupal is also very easy to learn and use. Drupal web technology is increasingly being adopted across the globe. It is currently in use by massive organizations including the White House, McDonald's, Twitter and so on (Imagex, 2014). More and more educational institutions are also using Drupal for their website design. According to statistics, 71 percent of top universities use Drupal and 28 percent of all .edu sites use Drupal. There are a lot of reasons why the use of Drupal is dramatically increasing in education. The following characteristics of Drupal would be the primary reasons: content generation, reusable content, branding and design, and mobile and accessibility. To generate content, you do not have to be a web expert. Drupal is very user-friendly and allows users to upload content easily. You can manage any media and even spin up a brand new additional site in minutes. The content or templates created with Drupal can be reused or shared easily. In addition, websites created with Drupal can be accessed from personal computers or even smart phones and tablets, which is very convenient for both teachers and students to access learning materials. Using Drupal in education can not only save instructors or institutions a lot of money but also save them a ton of headaches down the road. Even though Drupal is easy to learn and use, it has very powerful functions. With Drupal, instructors can design all possible collaborative learning activities such as discussion board, blog entries. Collaboration is essential for students' learning. In the following paragraphs, I will discuss why multimedia instruction and collaborations are important for facilitate learning.

2.6 Why We Need Drupal

With the rapid development of technology, more and more web and mobile learning technologies have been employed in teaching and learning. It is important for instructor to be able to integrate these technologies in their instructional design in order to facilitate learning. However, many multimedia learning tools are not easy to learn and use and instructors are usually reluctant

to spend too much time to learn and use these tools. Drupal is a very powerful open source content management platform that is relatively easy to use in comparison to other website design software. It provides great potential for instructors to design almost all the interactive learning activities they need for their students. Multimedia is of great benefit for instructors to deliver learning materials effectively and efficiently; however, not all multimedia is appropriate for all the learning situations. Drupal provides a platform in which all possible learning activities can be created. With Drupal, instructors are also able to increase the effectiveness of collaboration between students and teachers and therefore facilitate learning. Overall, the benefits by using Drupal for online learning course can be categories as follow:

- To increase student interaction with course-related technology
- To provide multiple forms of participation to students
- To gather evidence of learning in a single location
- To centralize the technologies for easy use
- To simplify management of student work for students and instructor

2.7 Useful Module for Online Learning

The most popular modules for social learning network are as follows: ELMS: Course Information System. The features are as follows:

- Data visualization tools (Google Chart Tools)
- Data import
- User management tools for distributing the course creation and setup process

ELMS: Collaborative Learning environment. This project is part of the ELMS initiative at Pennsylvania State University. Instructor can use it to create online collaboration group. Each group can assign team leader to manage. DrupalChat: Online chat. Instructors can use it for answering students' questions. It is safe because only the register use can see all the information. Forum: Online discussion forum. Instructor can provide some interesting topics for their student to discuss. Calendar and Event: These modules allow instructors or teaching assistants to create a calendar of all course events, primarily assignments and discussion topics. Rather than the traditional course schedule chart, however, these events are visible in an actual calendar. Students can also filter the events depending on what they need to see. Signup: This module allows students to sign up for events and then receive email notifications. For any assignment, therefore, students can sign up and receive emails a few days in advance so they are not caught off guard by due dates.

3 Drupal Demonstration and Code

In order to design the Drupal website, some software and modules need to be installed. The detail as follows: Software: XAMPP (cross-platform web server solution stack package consisting mainly of the Apache HTTP server, MySQL database, and interpreters for scripts written in PHP and Perl programming languages) Required Module: Nodequeue, Chaos tool suite, Backup and Migrate, Devel, Libraries API, Forum, Blog, Contact, Calendar, Data, and Zenophile. Other Software: Drupal 7 and Netbeans.

Code Hwo to delete Site Name and Site Slogan

```php
<?php if ($site_name || $site_slogan): ?>
      <div class="header__name-and-slogan" id="name-and-slogan">
        <?php if ($site_name): ?>
          <h1 class="header__site-name" id="site-name">
            <a href="<?php print $front_page; ?>" title="<?php print t('Home');
?>" class="header__site-link" rel="home"><span><?php print $site_name;
?></span></a>
          </h1>
        <?php endif; ?>
        <?php if ($site_slogan): ?>
          <div class="header__site-slogan" id="site-slogan"><?php print
$site_slogan; ?></div>
        <?php endif; ?>
      </div>
<?php endif; ?
My account and logout
    <?php if ($secondary_menu): ?>
      <nav class="header__secondary-menu" id="secondary-menu" role="navigation">
        <?php print theme('links__system_secondary_menu', array(
          'links' => $secondary_menu,
          'attributes' => array(
            'class' => array('links', 'inline', 'clearfix'),
          ),
          'heading' => array(
            'text' => $secondary_menu_heading,
            'level' => 'h2',
            'class' => array('element-invisible'),
          ),
        )); ?>
      </nav>
    <?php endif; ?>
```

function code 2 How to fix issue: No front page content has been created yet

```php
Write the function in template. The function as follows:
function johnnycs_preprocess_page(&$variables,$hook) {
   unset($variables['page']['content']['system_main']['default_message']);
 }
```

4 Future Work

In order to do some research on Drupal, I designed a personal website with basic function such as contact me, forum, and blog. This is not enough for teaching online course. Therefore, more functions need to add later. For example, calendar function for reminder, online video tutorials, and twitter function will be added. In addition, some security issues and assign user the appropriate permission need more research. For example, how to protect your personal information. In addition, school policies are also need to be reviewed and considered.

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