

# Web 2.0 and Its Implementation to eLearning

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## Abstract

*Web 2.0 is a new buzzword being used in the Internet these days. The concept had become popular after the discussion was made in 2004 between O'Reilly and MediaLive International. Although most people claim that Web 2.0 is the second phase of the World Wide Web development, it is not apparently clear what it means and what it takes. However, the proponents of Web 2.0 formulated the seven principles characterizing the current practices which are explored. These are (1) The Web As Platform, (2) Harnessing Collective Intelligence, (3) Data is the Next Intel Inside, (4) End of the Software Release Cycle, (5) Lightweight Programming Models, (6) Software [written] Above the Level of a Single Device, (7) Rich User Experiences. Relatively, the principles of Web 2.0 have the following key components: connectivity, interactivity and participation from the users. Nowadays, this concept is also being used in the field of education which has come to be known as E-Learning 2.0. This paper presents the process of implementing the concepts of Web 2.0 in E-Learning by integrating different tools into the concept which will help users learn fast and interact effectively while using E-learning website.*

**Keywords:** Web 2.0, RSS, E-Learning, Education, Web Platform

## 1. Introduction

Even though Web 2.0 is becoming an interesting topic in the internet, it is not a familiar word for the users. There are a lot of users still asking for the meaning, the function, and the objective of Web 2.0 and also comparing it to the present web technology. They are afraid that Web 2.0 will make incompatibility in the client side. But none of the technology on the client side is changing. The development of Web 2.0 emphasizes on the way of thinking to provide the content and interface on the website. The Web was shifting from being a medium, in which information was transmitted and consumed, into being a platform, in which content was created, shared, remixed, repurposed, and passed along [2]. Most of the concepts in Web 2.0 integrate some web technologies in the present days.

Nowadays, Web 2.0 is a new buzzword in the Internet. This concept has been well-known after the discussion between O'Reilly and MediaLive International in 2004. Despite the claim that Web 2.0 is the second phase of the World Wide Web development, it is not actually clear what it means and what it takes. Some of them emphasize on the social network between the website and its users, like the Blog does. But others push the ideas on using web as a platform, like AJAX (Asynchronous Javascript and XML) does [5].

The users can run the word processor or spreadsheet software using the web browser only. They do not have to install the software in the computer, but they can access the website of the application provider via web browsers, for instance, Google Spreadsheet (<http://spreadsheets.google.com>) or Zoho Writer (<http://www.zohowriter.com>).

Through these applications, the users can create, format, and edit documents online with a powerful WYSIWYG editor. Moreover, they can access and share their documents from anywhere using only the web browser. Users do not need the conventional storage anymore. Saving and sharing the documents can be done via internet.

## 2. Concepts Overview

After the brainstorming between O'Reilly and MediaLive International, they published the seven character principles of Web 2.0 [4]. The first character is web as a platform in which the users can create the web as a place to work at everywhere. They only need to open the web browser and then they can type, calculate, analyze finance, or create a presentation document using any application related to the work and publish the work directly in the internet. The example of this first character can be seen in the following figure.

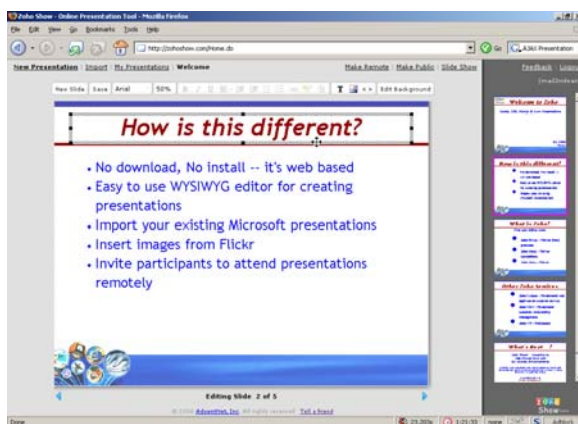


Figure 1. Web as a platform

The second character is participation from the users on the knowledge collaboration. It reminds the users about the trust that is given to the internet users like in the Wikipedia. They can share their knowledge in the Wikipedia, an encyclopedia based on the web which is developed by the internet users over the world. The content is characterized by open communication, decentralized authority, freedom to share and re-use, and dynamic interactivity [1].

The next character is data that becomes a trademark of application. It reminds the internet users with the "Intel Inside" slogan which is famous among the computer users. That trademark has been a trust guarantee to the users who have a computer or want to buy a computer. The same objective explains the third character in which the data supplier will give a trademark. That trademark will be used by a website owner to give the trust guarantee to the visitors. A few examples of this character are "Nevteq Onboard" slogan for the map data on the GPS navigation and "Powered by Google" for the Google Maps which supports the world map based on web.

The fourth character is web 2.0 as the end of software release cycle; it illustrates every software producer which does not release their product physically. Because of web as a platform, users can come to the website to run the software that they want to use. Every update can be used directly by the users. Software is not sold as a product but as a service. Producer who gives the faster and better service will be chosen by users.

The fifth character is the support of the simple programming and the idea of web service. The existence of RSS can be remixed easily by other websites using their own interface, web design, and simple programming.

The sixth character is software which is not limited to specific devices. It emphasizes on the term of web as a platform in which all application can access. Computer is not the

only device that can run any application on the internet. Every application on the web 2.0 must be designed to run at personal computer, handheld devices (mobile phone or PDA), or internet server.

Finally, the last character is innovation on the client interface using Rich Web Applications with AJAX. Supports of AJAX which integrates HTML, CSS, Javascript, and XML on the Yahoo!Mail Beta and Gmail make the users get more additional values than ordinary web based e-mail service. Combination Instant Messenger or Voice over Internet Protocol can create a stronger character of Web 2.0 on the website.

### 3. Strategies

The existing eLearning website can adopt several characters to be implemented in each situation. In this pre-eliminary experiment, the five characters which can be adopted are the first character (web as a platform), second character (participation from users), fourth characters (the end of software release cycle), fifth character (support from simple programming and the idea of web service), and the sixth character (software which is not limited to a specific device).

The first character is web that can serve as lecturers' workplace. The lecturer can use the web to create the presentation, text document, or other else. If the lecturer has created the documents before, the documents can be imported to the web and saved in the server. Since it is saved on the internet, users can see the documents via the internet or participate in giving any input or changes if the lecturer share it for them.

Like Wikipedia, every change is saved in the history. Everyone can see the changes until the official document is released by the lecturer. This kind of collaboration emphasizes the second character of Web 2.0. The users are trusted to make changes but

their activities are recorded to give clear information to other users about the changes.

The fourth character can be adopted to eLearning website to help the lecturers create their presentation, text document, or others without installing the application. The lecturers can visit eLearning website and do their job there. eLearning website must be equipped with several office applications to support the lecturing.

Based on the fifth character, the saved documents can produce RSS to support the simple programming and the idea of the web service.

The flowchart of produce XML RSS can be seen in the following figure.

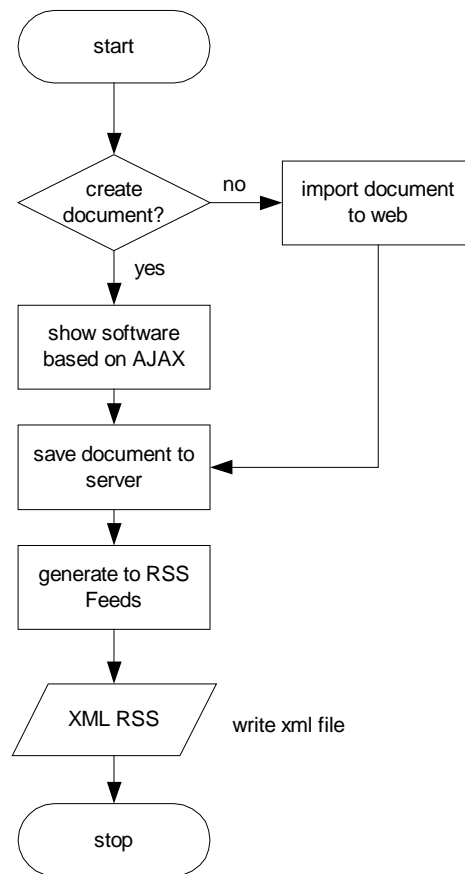


Figure 2. Produce XML RSS via web based software

The flowchart explains (1) If the lecturers want to create a new document, they will get the software based on web. Otherwise, they can choose to import the existing document to be saved on the server. (2) After the lecturers finish the activity, they can save the document in the server, and (3) generate it to produce XML RSS.

Because the output is XML RSS, the educational content can be accessed via mobile phone, PDA, desktop computer, or other media using any communication media, such as GPRS, HCS D, EDGE, LAN, or WiFi.

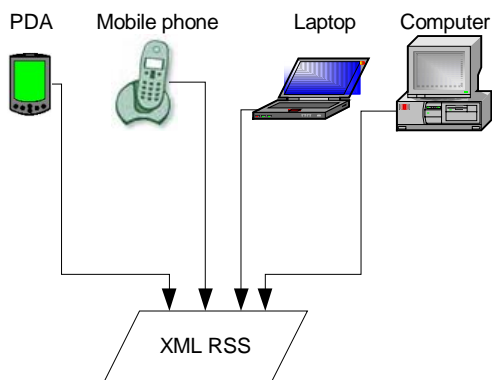


Figure 3. XML RSS can be accessed by any devices

The XML RSS can be adopted by other website with simple programming. However, for the commercial education, RSS can be supported by HTTP authentication to limit the users. Only registered users can access the RSS from their own device.

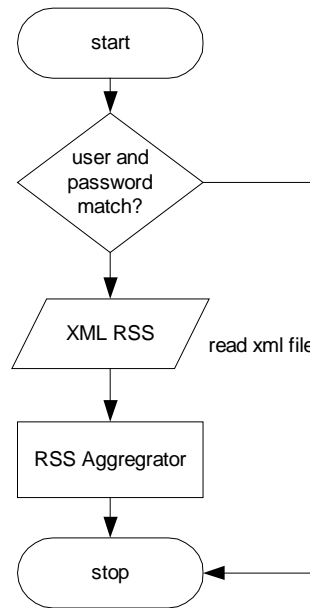


Figure 4. XML RSS with HTTP authentication

#### 4. Implementation

To provide the software based on the web, the university can develop E-Learning website using AJAX. An example of the office application can be seen on [zohoshow.com](http://zohoshow.com) (presentation software), [zohowriter.com](http://zohowriter.com) (word processor), [zohosheet.com](http://zohosheet.com) (spreadsheet), and [spreadsheet.google.com](http://spreadsheet.google.com) (spreadsheet). They have the capability to access from anywhere, share and collaborate, load the existing document based on the Microsoft Office and OpenOffice; thus, installation is unnecessary. A simple office application can be seen on Figure 5.

After the lecturer saves the documents, it will create an xml file using RSS format (see Figure 6). This format is used to provide items containing short descriptions of web content together with a link to the full version of the content. The items can be seen by using the RSS aggregator application which is installed in desktop computer (see Figure 7), mobile phone, and PDA (see Figure 8).

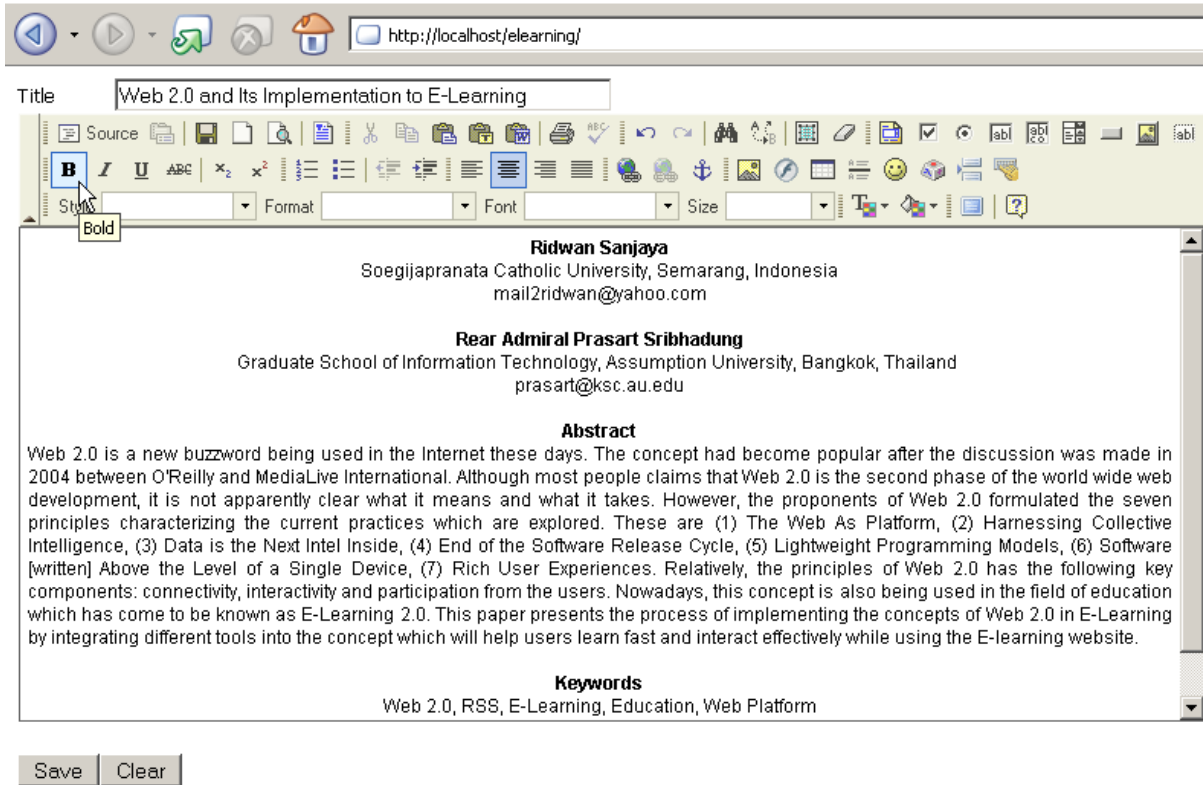


Figure 5. Sample office application based on the web

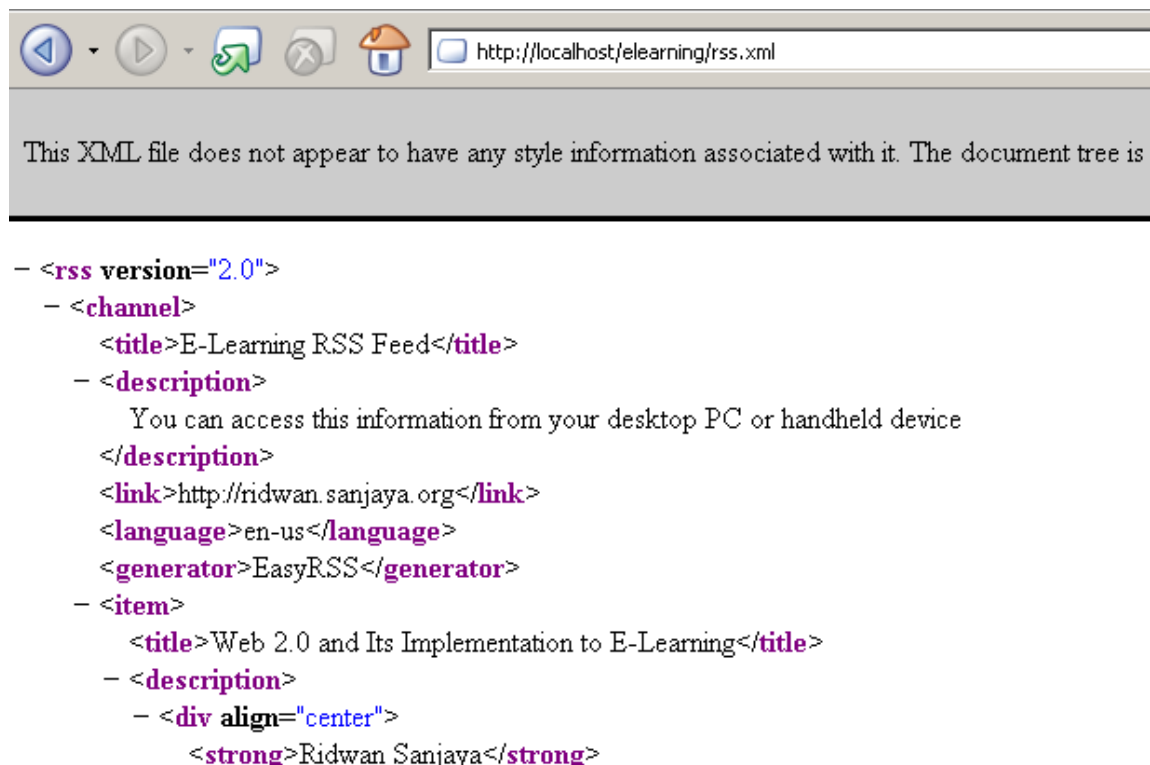


Figure 6. Saved document on the XML RSS format

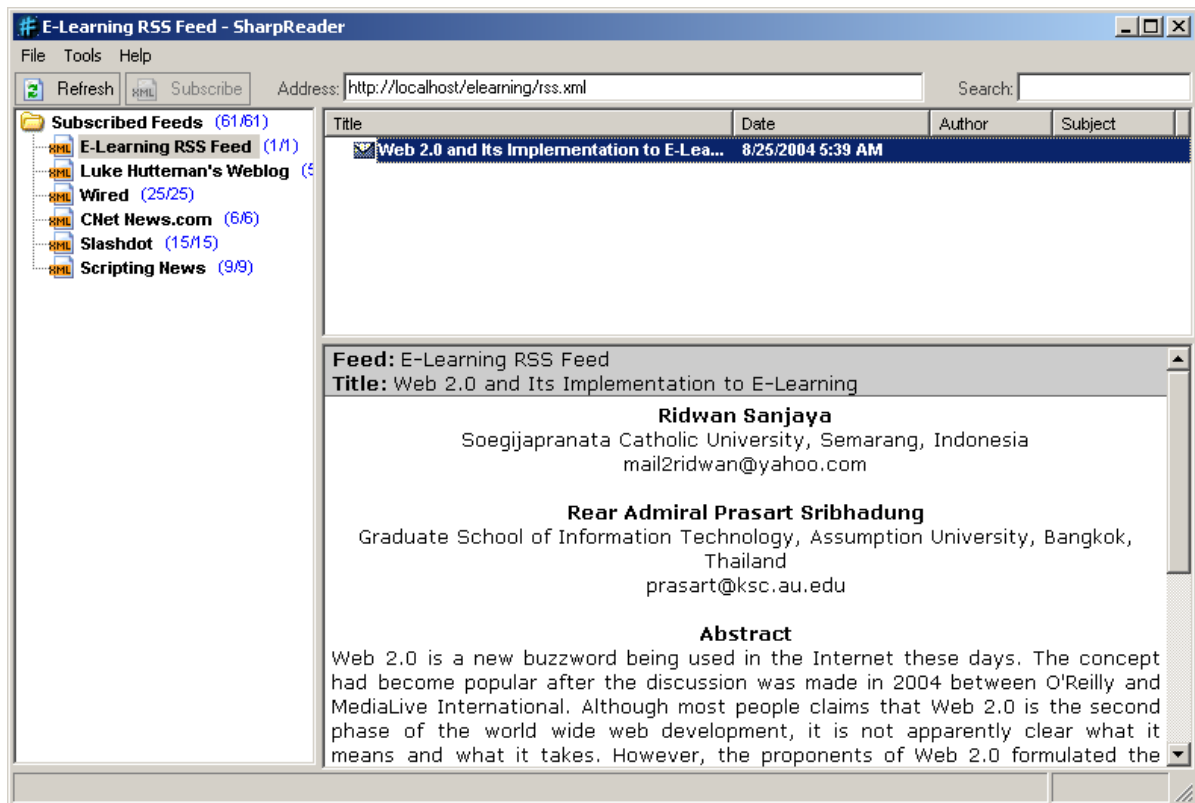


Figure 7. View of the e-learning content from the desktop application



Figure 8. View of the e-learning content from the handheld device

For the commercial education, RSS can be supported by using HTTP authentication. It will limit the number of users. Only the

registered users can access the RSS from their own device. The HTTP authentication is a common method to provide security on the website. However, when HTTP authentication is combined with SSL, the RSS can become more secure [3].

For Apache web server users, they have to make sure that the value of AllowOverride parameter in the httpd.conf file has changed to All.

```
# AllowOverride controls what directives may be
placed in .htaccess files. It can be "All", "None",
or any combination of the keywords: Options
FileInfo AuthConfig Limit
AllowOverride All
```

They have to create .htaccess and .htpasswd files in the saving directory. The content of .htaccess file can be seen on the following. Then, they have to modify the e-learning-directory string to the real location on the web server.



```
AuthUserFile /elearning-directory/.htpasswd
AuthGroupFile /dev/null
AuthName "E-learning Authentication"
AuthType Basic

<Limit GET POST>
require valid-user
</Limit>
```

student list. To make it dynamic, it can be connected to the database as well.

```
htpasswd -c .htpasswd username
```

Figure 9 describes the result of using HTTP authentication. Before the users access the content, they have to write the username and password. If it matches, the RSS XML will be read and it will be saved on the RSS aggregator application. The flowchart can be seen at Figure 4.

To create .htpasswd, the command can be typed as the following. Then, they have to change the username to the real name on the

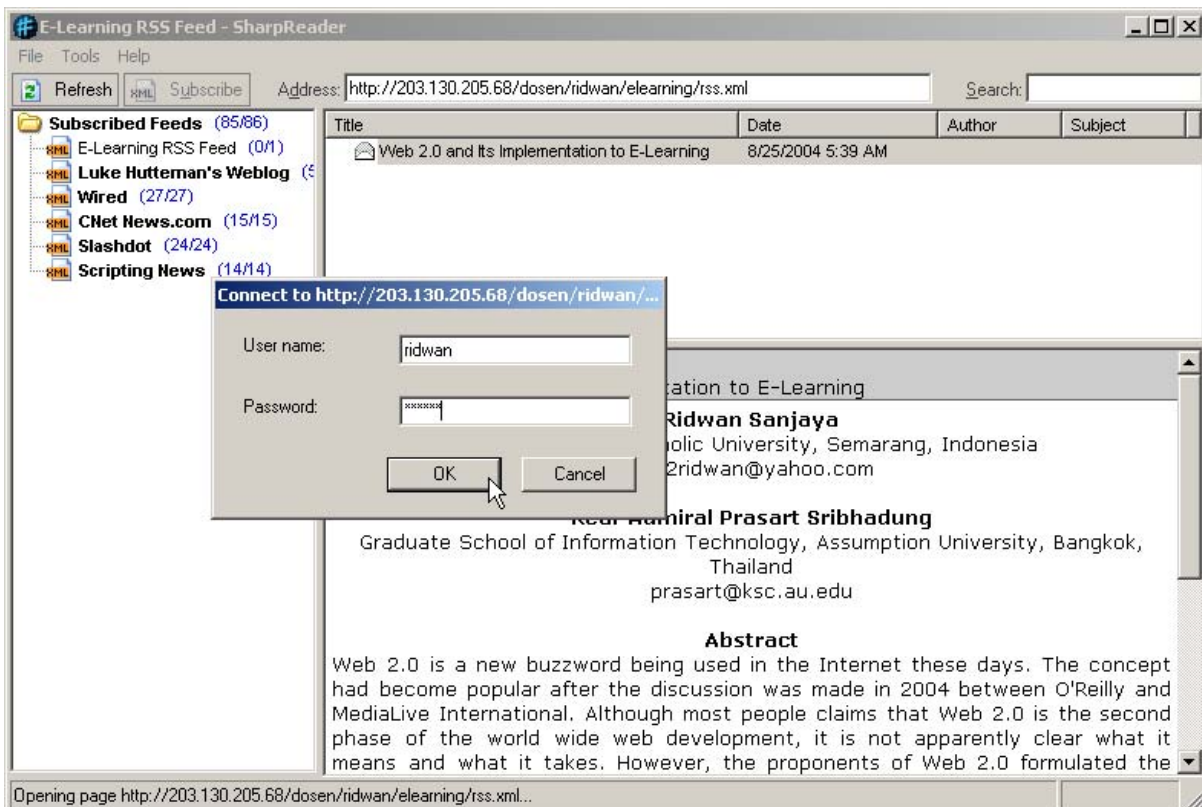


Figure 9. Using HTTP authentication

In order to invite the users to participate, e-learning website can provide editing forms. Each edited activity and the user's identity will be recorded in the history. If the editing is not correct, the lecturer can rollback to the previous document based on the history list. The E-learning website can also be equipped with the shoutbox or chatbox as a communication tool between the lecturer and students.

## 5. Conclusion

E-learning website can add several characters on the Web 2.0 to provide some advantages for its users. First of all, by using the Web 2.0, users do not have to install the software. The next advantage is users can access the E-learning content without visiting the website. Finally, users can access the E-learning content from any devices.

Besides these advantages offered to its users, the use of HTTP authentication can limit the number of E-learning content viewers. Only the users who have rights can access the content of E-learning.

Although E-learning website is equipped with several communication tools to

encourage users' participation in sharing knowledge, this website still needs lecturers' trust in order to maintain the participation.

## 6. References

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