The Roles and Functions of the ULSS (Ubiquitous Learning Supporting System)

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Summary
Due to recent development of wireless internet and information& communication technologies, interests on u-learning(Ubiquitous Learning) have been increased. In order to implement u-learning, ULSS takes part in essential role for construct successful u-learning environments. In this paper, first of all, the necessity of the ULSS is introduced. Also, background information is presented for the recent ULSS emergence. Based on the discussion, the formal definition of ULSS is presented. Also, various functions of the ULSS are introduced.

Keywords:
U-learning, ULSS, LMS, LCMS

1. The necessity of the ULSS

'Ubiquitous' is originated from a Latin word, and means 'anytime, anywhere' or 'everywhere' etc. The term was known to the general public, when Mark Weiser of Xerox Company introduced the concept of the 'Ubiquitous Computing' in 1988. The ubiquitous learning of the new type of education in the Ubiquitous age can be defined as following e.g. "It means that students can access a course of study, anytime, anywhere in the normal daily lives, regardless of their time, places, and environment, based on ubiquitous learning environment." The characteristics of ubiquitous learning also can be summarized as following[1,2]:

- There's no boundary of time or space in the ubiquitous learning. That is, it enables them, anywhere, anytime to exchange any information they want through using wire/wireless networking without restrictions of the devices.

- It emphases the necessity of the individualized education. The ubiquitous learning presumes a situation that every student is able to possess his or her device. Based on this assumption, when required contents are provided to them, they can choose their best fit teaching and learning method.

- It maximizes the effects of interaction.
The ubiquitous learning maximizes the effects of interaction among parents, teachers, and expert from various levels of the society to enables them to communicate each other through using wire/wireless networking. Also, it maximizes the effects of interaction not only for humans, but also, for the interaction between the terminals by means of individualized agent functions.

- It helps keep track of learning procedures.
Under the ubiquitous learning environment, the diversified information is provided to the students, and it makes it easy to trace back the previous activities of their learning, to be able to reflect the whole learning procedures. By following this, it enables to record the student's whole activities, and then it makes it appear that the evaluation of learning procedures is much more important than that of the results of the learning

2. The background of ULSS's emergence

Under the existing E- learning environment, both the LMS (Learning Management System) and the LCMS (Learning Content Management System) have been used to provide efficient contents to the students as well as to provide means of efficient management of the learning/ educational matters. Both of these two established the LMS and LCMS in the ubiquitous environment have the followings problems[3,4]:

- It offers less support to the wireless internet environment. Under the ubiquitous environment, not only the common classrooms but also all the spaces outside of the classrooms can provide the places of learning.
   Furthermore, it becomes common to see more and more instruments of many kinds that being equipped with tags and sensors are gradually connected wirelessly. As the existing LMS/LCMS were basically started on the foundation of connected internet environment, they are not sufficient enough to provide supports to the ubiquitous system environment.

- It has limited ability to cope with the brainy terminals

Under the ubiquitous system environment, various kinds of personal terminals, such as PDA, Tablet PC and UMPC, etc. are currently being used, and both of their abilities and capacities are getting better and bigger everyday.

Furthermore, its use of brainy terminals is increasing by the development of interspaces. The compatibility with these kinds of brainy terminals is very important, and also the ability to deal with the transparency of information between the terminals, and also between the connected and wireless equipments as well, is very important. The existing LMS and LCMS have their own capability limit to provide support these kinds of brainy terminals.

- It lacks the capability to support the prompt interactivities.

Students need the required supporting systems, with which they could access the information they want anytime, anywhere, and also, they should be able to solve the issues by prompt interactions through the various kind of communications with their parents, teachers, and professionals, etc. Both of the current existing LMS and LCMS are neither sufficient to provide accessibilities to the information they need, nor have the capabilities to support the interactions between the people of various fields.

- It can't provide the characteristic contents.

Under the ubiquitous system environment, many types of available personal terminals, along with the development of speedy networking will enable the individualized personal educations, in which personal taste, the background knowledge etc., are considered relatively, to increase gradually. In this general tendency, the individualized contents that are being provided should be characterized and diversified. It can not be denied that there have been lacks of educational resources, lacks of conversion technologies, etc., in the existing LMS/LCMS, under which it was impossible to provide the adequate personalized education.

- It doesn't have the ability to provide support for multiphase evaluations.

Under the ubiquitous environment, it makes it possible to record the whole procedures and results of education through various sensors and terminals.
Therefore, it's possible to monitor student's learning activities, and also, it's not difficult to look at the evaluations of student more objectively and clearly.
On the contrary, under the environment of the existing LMS/LCMS, it is possible to view only when the student accesses the system intentionally but it has its own limit to make it impossible to look at the whole time and spaces that the student can't recognize. Therefore, the fact that the existing LMS/LCMS can't provide the necessary functions in the ubiquitous system environment raises the issues of the necessity of ULSS, which can provide the support for both the connected and wireless terminals that are equipped with various functions.

3. The concept and functions of the ULSS

In order to achieve the ULSS, three foundation structures are needed[5].

- Internet connectivity

There should be the availability of internet services through the infrastructures of WiFi, Bluetooth combined with GPRS, Wireless broadband, etc. that provide continuous services.

- Single content repository

All of the contents should be stored in a single repository, That is, they shouldn't be stored in several repositories in order to maintain the integrity of the desktop PC, Notebook, and Pocket PC.

- Output variation

Either the sizes of the contents should be adjusted to be able to meet the requirement of the size of the terminals and technological restraints, or the contents itself should be redesigned to get them displayed on the mobile screen adequately.

- Filtering

Even the same contents should be adjusted through the method of the conversion of its contents, conversion of its structures is also necessary to have them compatible with the user's equipments.

I have reflected and considered the basic concepts of the ubiquitous learning and the ubiquitous system environments so far on this article. I would like to define the ULSS as following. That is, "It means a system that enables the students to access a course of study, anytime, anywhere in the normal daily lives, regardless of their time, places, and environment, based on ubiquitous learning environment."

4. Conclusion and suggestions

We should consider the followings, as mentioned in this article, if we want to have the ULSS applied adequately and properly in the schools.

- It should provide the user friendly interspaces.
First of all, it should provide the simple and user friendly interspaces in order to be useable by various users.

- It should be able to provide information harmoniously.

Because of its nature, it is based on the environment of the coordination between the connected or wireless terminals. That is, it should be able to provide speedy transmission of the information along with the amicable adjustment of the contents for the various kinds of mobile terminals, also it should be able to provide the appropriate service for the newly emerged products in the market.

- It should provide the diverse services to users.

The ULSS provides more diversified service functions to users than those by the LMS and LCMS, and has more wide spread levels of users than the LMS and LCMS. It is very important to provide the users the useful menus and contents, in which the tastes, characteristics of the users were already filtered.

- The capacity of battery

The batteries of mobile terminals currently allow unreasonably short time to use. It should have the adequate capacity to provide reasonable enough time to go on the smooth education.

References

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