

**A PRACTICAL STUDY ON ASP E-LEARNING MODEL FOR
DEVELOPMENTAL EDUCATION**

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Abstract. Developmental education is the pre-course program aimed at offering students an extra chance to reach post-secondary academic success. Many Japanese universities adopted this system for freshmen as a complement to regular curriculum. It is usually carried out in an E-learning environment with occasional instructions available from teachers. This study provides a practical review of ASP system on basis of a close observation of its application, analyzes some key human factors, which should be adequately considered in the process of designing, and explores the possibility of improving systems for developmental education to low-proficient students. This paper argues that human factors, including psychological requirements of both teachers and students, are crucial in web-based learning, especially for developmental education, and reciprocity should be abundantly

demonstrated in order to enhance the implementation of any E-learning project.

1. Introduction

Developmental education refers to the pre-college training program for students with no admirable academic proficiencies. It originated in America for the purpose to help students “achieve their maximum potential and enhances their chances for academic success by providing opportunities for skill development through courses and programs designed to improve basic skills” (<http://www.developmentaleducation.eku.edu/>). Similarly, many Japanese universities/colleges started to provide newly-enrolled students with supplementary education in general education subjects in order to compensate for the deteriorating situation in their basic knowledge learning in recent years (Ono, 2005). E-learning is increasingly being adopted in developmental education “as a routine instructional media” (Huddleston and Pike, 2007) due to its considerable efficacy (League for Innovation in the community College, 2005).

In face-to-face class, teachers carry out the following duties to fulfill their teaching tasks: (1) Establishing and adjusting teaching plans according to his/her judgment of students’ learning abilities; (2) Transmitting information and making explanations about the generated knowledge; (3) Handling questions and offering answers. (4) Making comments and evaluation on students’ achievements. These four aspects interpret the process of regular instruction and neither of them can be separated from the learning activities of students. Besides teacher-student interaction, communication between students is also a crucial factor to the understanding of the pedagogical materials. The characteristic element of reciprocity is indispensable for any teaching contexts and imperatively to be demonstrated in any E-learning program, especially in the case of web-based training. How to help them obtain prompt correspondence to their involvement in the system is the key point in its designing and administrating process.

ASP (Active Server Pages) system is typical of the widely accepted E-learning devices in Japanese developmental education (Zhang, Wang & Ishino, 2008). It saves teachers from the hard work of creating contents and reduces the burdens of universities/colleges by providing unified server management service (Figure 1). But does it functioning well as an all purpose tool? Can it substitute for the teacher by capably performing teachers’ missions mentioned above? “Increasing effectiveness of the e-learning has become one of the most practically and theoretically important issues in both educational engineering and information system fields” (Lee, J. and Lee, W., 2007).

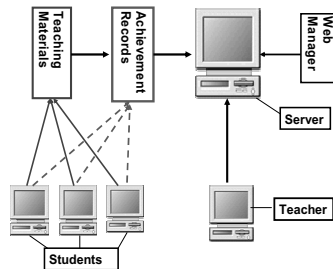


Figure 1. Framework of ASP system.

This paper examines the ASP E-learning model for developmental education developed by Wao-net. Corp., makes a close observation of its implementation process and analyzes the human factors which need be taken into account in its application. This study emphasizes the significance of enhancing both technical and managerial processes on basis of a correct understanding about cognition mechanism of users.

2. Cognition Mechanism

Cognition in a web-based training (WBT) environment indicates the psychological demands of both mediate users (teachers) and end users (students) on the application of the system. In order to fulfill their respective objectives in learning and teaching, mediate users need figure out the reactions of students to the contents and further extend students' academic potentialities, and end users are eager to be awarded with chances to conduct inquiries about the delivered knowledge rather than being passive recipients of information (Lee, J. & Lee, W., 2007). Nickerson (1987) viewed such psychological processes as the key determinant in improving the quality of any learning model (Garrison & Anderson, 2003).

Exploring students' cognitive attitudes has more in-depth implication in developmental education through E-learning. Low proficient students usually lack motivation, confidence and self-regulatory efficacy. They show comparatively less intended efforts in learning, fail to carry out the original learning plans and tend to be the dropouts. But they are required to be responsible for their own study and manifest self-regulatory efficacy through

self-observation, self-judgment and self-response in an E-learning environment (Huddleston and Pike, 2007; Bandura, 1986). The absence of the face-to-face instruction seriously stiffens their disadvantages in managing studies on their own.

Cognitive obstacles are alleviated or removed with a practicably user-centered system for developmental education. The cognitive design and deployment help reduce those covertly distressing factors if awareness is substantially heightened in interface design and at collaborative managerial level. The underlying objective of all these efforts is to “increase the potential to realize learning systems that better meet different user needs and that provide a more satisfying learning experience” (Marsico, Kimani, Mirabella, Norman and Catarci, 2006).

3. Interface Design

Technical accessibility is the prerequisite for any endeavor to improve an online learning model (Barr, 2004). Rapid progress in Information Technology (IT) increases the possibility for more thorough consideration of users’ demands. Delicate psychological care to users is realized through the profound application of multiple technological appliances. Recently, many software developers have realized the necessity of strengthening flexibility through component technologies at the designing stage and “offering end users manageable software flexibility at run-time/use-time” (Wulf, Pipek and Won, 2008; Nickerson, 1987). This challenge to meet end users’ needs maximum is beyond the current web-based learning models, but throws light on future software development in this field.

In a web-based learning context, all the serviceability made available by technical accessibility is reflected on human interface. Interface functions as the direct medium of communication between software creators and users (both mediate and end), mediate users and end users, and among end users. All of the messages implied in the interface construct an ideally virtual environment similar to the regular classroom. Nickerson (1987) proposed the concept of “cognitive interface” with “user friendliness”, stressing “the relatively invisible variables that are critically important to an effective user-system interaction”. Researchers found out that learners even ask for politeness in the design of online tutorial feedbacks, which was reported to have “yielded better learning outcomes” (Wang, Johnson, Mayer, Rizzo, Shaw and Collins, 2008).

In ASP system, interface is a reminder of digital contents and progressing records installed in the database. Instant retrieving of digital information helps define both teaching and learning activities at the following dimensions: (1) Users (mediate and end) obtain digital information from

creators; (2) Student users receive instructions from teachers. But within most models for developmental education, reactive and autonomous behaviors of the message recipients are not sufficiently supported by the interface.



Figure2. Sample Picture of Interface.

The sample picture in Figure 2 is the top page of an ASP system following the log-in window. The main body is divided into three sections: the upper message section, the middle content section and the lower blank section. The content section is strikingly designed and clearly indicated. Students often get confused with the message section because expressions are too simple. They are not notified to whom their messages are going to be sent, and how to get their problems promptly solved. Although one of the icons on the top right is set for automatic inquiry, users often fail to acquire correct replies, because of the excessive restrictions on questioning and there are no guidelines exhibited in the interface. Only 3% of the students were reported to have ever succeeded in obtaining the exact replies concerning their queries, either from the web manager, or the automatic inquiry system. Consecutive failures to attain expected help result in users' complete ignorance of this function.

Although holistic learning contents and tasks are indicated to students, they are not provided with any channel to send feedbacks/inquiries to their teachers, or messages to other students. Teachers are informed of students' progressing situation, but there is no applicable platform for them to make adjustment of the contexts, tailor curriculum plans, carry out detail explanations, and make evaluations on students' integrated performances.

APS system employed for developmental education in Japan tends to focus on unilateral knowledge delivery with no concrete instructions for users (especially student users) in case of incidents. Disorientation caused by excessive conciseness is the lethal defectiveness in its interface design.

Student users felt left alone and no one to appeal to in case of trouble. Such unfavorable situations in E-learning environment may have a robust impact on low-proficient students, causing frustration, discouragement and even withdrawal from the program due to their lack of independence and voluntarism in learning. Interaction policy based on user consciousness lays the foundation of E-learning system for developmental education.

4. Managerial Collaboration

Huddleston and Pike (2007) pointed out that “the superset of all instructional management strategies and the resources and systems that underpin it comprise what is referred to as the management of training system”. Management strategies involved in an E-learning environment are based on “learner characteristics” and include “scheduling lessons, production and allocation of required resources, assessment handling, production of management information and evaluation of the effectiveness of the system”. Training objectives can not be achieved without the collaboration of software developers, web managers and teachers. Barr (2004) assumed such collaborative administration as “senior management” which “needs to be prepared to support the creation” of systematic environment (Barr, 2004).

Close collaboration is particularly needed in the case of E-learning systems for developmental education. The psychologically vulnerable feather of low-proficient students intensifies their desire for a learning environment similar to regular classrooms, where they are frequently attended and security about learning is experienced. Collaborative managerial network helps expand the framework of ASP system for developmental education and the defects in its design are compensated to some extent by successful management strategies.

For low-proficient students, direct instruction is the most effective teaching approach and a major job of human instructors that no other substitute exists. Students often reject help from automated decision aid unless reliability, trust and reliance are warranted (Dzindolet, Peterson, Pomranky, Pierce, and Beck, 2003). We suggest that two types of direct instruction be integrated in E-learning environment for developmental education: advance training and regular live online support/offline face-to-face support. The former refers to on-site training for all users about the operation procedures before the program is carried out. It offers chances for users to get along with the system and improve their artificial manipulation skills to handle problems in order to avoid chaos both mentally and practically. The image of the latter may be an interview, a discussion or sometimes a lecture hosted by the teacher, through which student users may

exchange ideas with each other and make inquiries directly encountered in learning. No matter what forms such support activities take, they need be held regularly to reinforce the presence of instructors. Human support does not manifest its worth in problem orientation only, but rather distinguishes the significance of “fostering a sense of community” (Wang, 2004), which is at the core of online developmental education.

5. Conclusion

User need is the key factor in the assessment of any network system and should be met by “the design, implementation and operation of virtual environments” (Wilson and D’Cruz, 2008), and both “technical side” and managerial side” are to be dealt with addressing this issue (Altayeb, 1997). “Users of modern technology are not simply technology users but also service consumers and may consider both cognitive and emotional benefits” (Kim, Chan H. and Chan Y., 2007). Effective networks for developmental education are supposed to be created and developed from low-proficient students’ perspectives, and their application depends on contributions of all parties involved.

E-learning software for developmental education should serve both mediate users and ends users, facilitating their utilization, providing necessary tools for teaching and learning objectives, renovating the infrastructure to assure better results. Software developers, web managers and teachers need collaborate in management and administration, discussing feasible managerial strategies and redefining their duties to meet the changing needs of students.

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