

## A HYBRID E-LEARNING MODEL INCORPORATING SOME OF THE PRINCIPAL LEARNING THEORIES

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In the context of e-learning many learning theories used in the physical classroom situation, including learning in a community adaptive, collaborative, scaffolding, and scenario learning, have been adopted and validated. Based on these learning theories, an electronic platform and set of procedures for applying a hybrid e-learning model to an internationally accredited training course in industry was explored, developed, and evaluated for this study. This hybrid e-learning system provided electronic, illustration, group learning, comprehension, and workshop learning units and complied with the training objectives of the designated course. The validation of this model was positive and the results indicated that the proposed hybrid e-learning course could be further improved by taking into consideration individual learners' attributes.

*Keywords:* adaptive learning, collaborative learning, learning in a community, scaffolding learning, scenario learning, hybrid e-learning.

This research was inspired by recently developed hybrid e-learning practices and the latest theories about enhancing the effectiveness of the teaching-learning process. In the setting of a knowledge-based economy and organizational learning, learning theories such as learning in a community, adaptive, scenario, collaborative, and scaffolding learning (Protheroe, 2004) can be integrated into many hybrid e-learning practices, such as online digital content, multimedia training compact disks, supplemental learning content online discussion, and live

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broadcasting (Ijab, Anwar, & Hamid, 2004) to improve the teaching-and-learning process. Theoretically, the hybrid e-learning platform could incorporate the most up-to-date IT platforms in delivering applications such as those listed here. Much research on hybrid e-learning has been focused on use of media technology (Bharadwaj, 2003; Luo, Li, Cao, & Ge, 2006). Some researchers have been interested solely in applying specific learning theory to e-learning applications (Brewer & Klein, 2006; Dewiyanti, Brand-Gruwel, & Jochems, 2007; Own, 2003). No researcher has proposed a practical model to integrate all of these learning methods in order to maximize the potential learning benefits.

In this paper, the aim was to improve training effectiveness by using a practical hybrid e-learning model that incorporated the principles of the abovementioned theories. The relevant information technologies with respect to the application of hybrid e-learning content were employed to build up the system platform.

## LITERATURE REVIEW

Kolb (1984) identified four learning styles; namely, diverger, assimilator, converger, and accommodator. Milosevic (2005) described how these learning styles could result in personalized learning profiles because of different learning preference. Sun, Joy, and Griffiths (2007) presented a new approach to the incorporation of learning style theory in developing an adaptive e-learning system in which the adaptation into education systems was improved. Following this approach, in the hybrid e-learning model developed in this study, adaptive e-learning was realized by providing customized e-learning content, tailored to learners' individual learning styles.

All scenario-based e-learning, by virtue of the teaching method and the high value of knowledge, is considered to be useful in regard to enhancing student learning (Siddiqui, Khan, & Akhtar, 2008). The scenario-based learning method can be applied to network teaching and network learning (Own, 2003). However, Nidumolu, Subramani, and Aldrich (2001) suggested that scenario learning was not easily applied to the digitalized transfer of knowledge. Therefore, we used only a few basic scenario-based lessons in our hybrid e-learning model, to reduce the cost and time involved in the production process.

Arnold and Smith (2003) worked with a practice-oriented community to connect members together to share resources and complete the learning task effectively. The resultant value achieved in practice by interaction among members of the community could be greatly enhanced by community learning (Bradbury & Mainemelis, 2001). For the hybrid e-learning model used in this study the newsgroup learning environment on the Internet was used to promote learning as a group.

Providing learners with support, guidance, and assistance, that then helps them complete the task independently in order to improve their ability is termed scaffolding learning. Linn, Davis, and Bell (2004) described how scaffolded knowledge integration could be used in network learning, mutual discussion online, and for expression of learner thought. Liou et al. (2003) incorporated listening, speaking, reading, writing, and translation language activities to construct a computational learning scaffold. In the hybrid e-learning model used in this study, the *process approach* (Barnsky, 2004) was used, combined with media-rich illustrations to provide scaffolding for learning a specific body of knowledge.

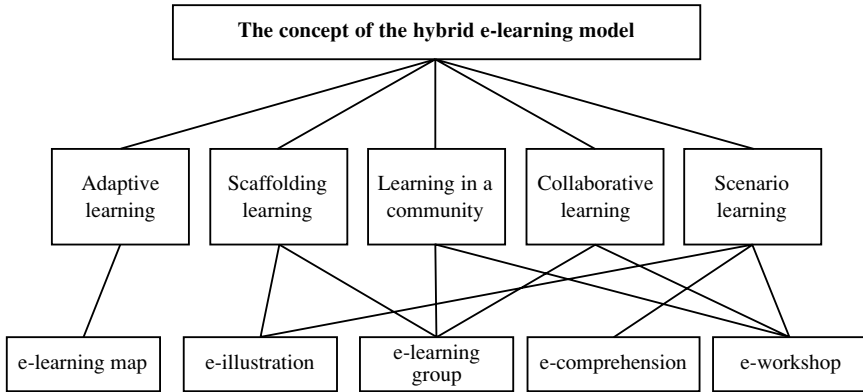
Dillenbourg (2002) stated that a way to enhance the effectiveness of collaborative learning is by structuring the interactions among students. He described how a well-defined script helps in computer-supported collaborative learning. Brewer and Klein (2006) and Dewiyanti et al. (2007) described the benefits in an asynchronous collaborated learning environment; and in the hybrid e-learning model used in this study an online workshop environment was built to facilitate students' collaborative learning.

In India, a learning service center with a hybrid learning system for improving management performance in businesses was set up by the Chamber of Commerce (Bharadwaj, 2003). The first hybrid e-learning model course of electronic commerce was developed at a university in Malaysia (Ijab et al., 2004). Luo et al. (2006) described the importance of integrating heterogeneous e-learning systems, and proposed a framework for an e-learning system characterized by an integrated platform. In our hybrid e-learning model an integrated platform to fit the application was also proposed.

## THE HYBRID E-LEARNING MODEL

### THE CONCEPTUAL STRUCTURE

In Figure 1, the conceptual structure of the hybrid e-learning model used in this study is set out, along with the hybrid e-learning system based on the literature review and previously tested models used in industrial settings. The e-learning map provides specific learning paths based on individual learning styles in line with the concept of adaptive learning. Scaffolding learning is applied for the e-illustration process and e-learning group. Learning in a community and collaborative learning theory are applied in the e-learning group and e-workshop, while e-illustration and e-workshop are based on the concept of scenario learning.



**Figure 1.** The conceptual design of the hybrid e-learning model.

### CONFIGURATION FOR THE IT PLATFORM

The interactions between instructor and learners are through the physical live classroom plus three layers of IT configuration (see Figure 2).

- A digital examination of individual learning style followed by an adaptive learning map.
- An asynchronous e-learning process, including e-illustration with practice examples, lecture and test on demand, learning in a community plus a workshop, supported by workflow, streaming, and newsgroup servers.
- A synchronous e-learning process consisting of online consultation and live broadcasting.
- An interface for hybrid e-learning content publishing supported by a hybrid courseware module.

### APPLICATION

***e-learning map*** A learning style inventory test was first provided in order to identify each student's learning preference. The trainer then defined the specific learning map for each group of individuals with the same learning style. Each learning map had a different emphasis on e-illustration, e-workshop, or e-comprehension to match the learning preference.

***Online e-learning*** Two alternative online applications were provided for students' lectures. One was live broadcasting through a web conference server for synchronous e-learning. The second was online download through a stream server for asynchronous e-learning. Together these provided location and time flexibility for students.

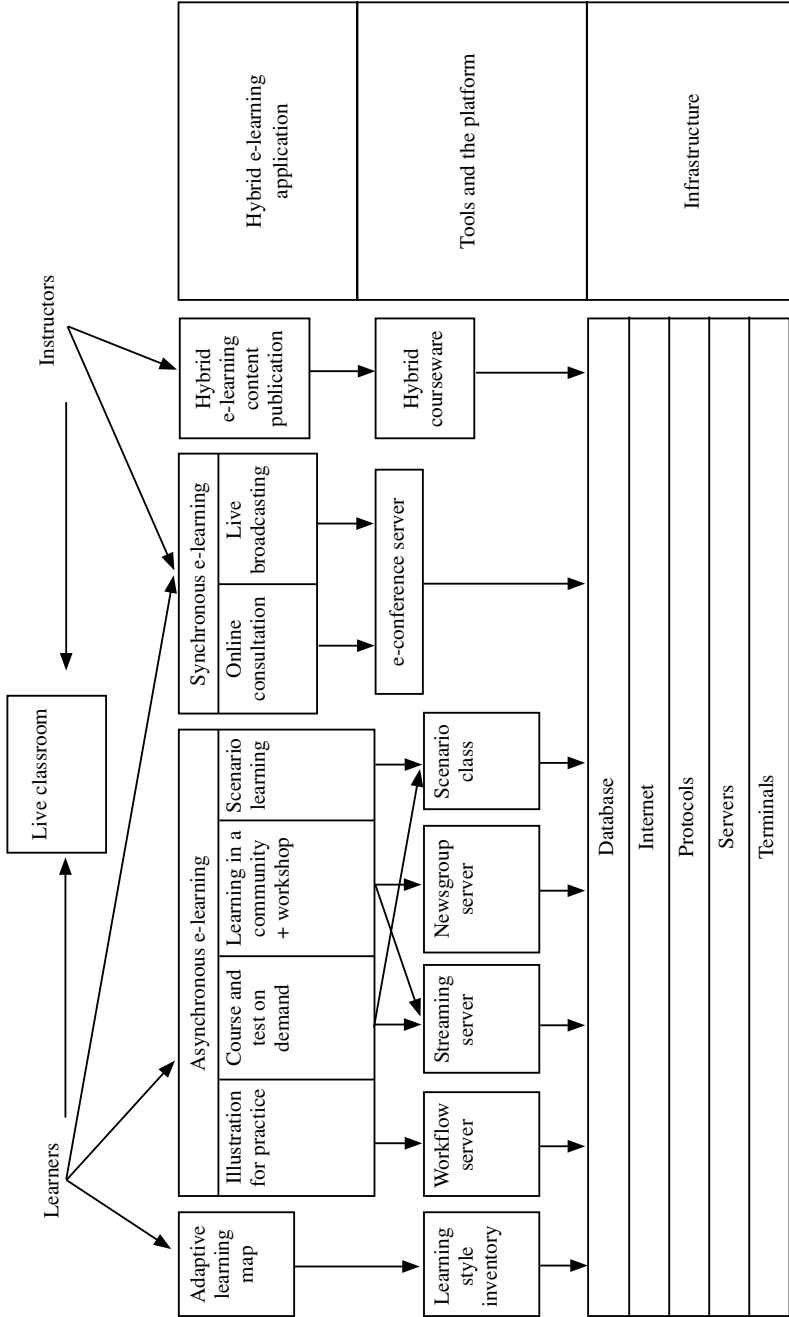


Figure 2. The IT platform.

e-comprehension

Customer-Oriented Process management

Who of the following are ALWAYS stakeholders?

A) A person who might lose their position in the company because of the project.  
B) A person who does not want the project to be completed.  
C) An assembly line worker that will use the product of the project.  
D) A functional manager from the engineering department.

YES NO NEXT

e-learning map

Learning Map

The content of your learning map

- Session 1 ISO 9001:2008 based systems
- Adoption of the process approach and PDCA
- What is the ISO 9001?
- Requirements for content
- 1-200 Quality Assurance

e-illustration

Step 1  
Step 2  
Step 3

Hybrid e-learning model

e-learning group

Hot topic

- EQ's Chief Executive Officer to Speak at the ISO 9000 Conference
- Congra Eams Critical ISO Certification From STR-Registrar
- MTI Electronics - ISO 9001:2008 and ISO 13485:2003 Re-Certification

Course Guide: Search key

New Courses: ISO9001:Lead Auditor Course Released topic-----Manager: natasha

e-workshop

Powered By: Workshop

Useful Links: Home

Conference: Start Here! Presentation

Share List

Ready to go?

Figure 3. Hybrid e-Learning Model.

***e-learning group*** The resources in the learning community were shared through the newsgroup server. The communications between the trainers and the learners, as well as the interactions among the learners, were carried out via publications and discussions on the Internet. An audiovisual platform was provided for publishing learning “news” either by speaker phone or by cam viewing.

***e-comprehension*** In the scenario-based learning process, examples of vocational practices were provided through the server. The server actually had many interfaces for trainers to link to various case studies in the forms of hypertexts, websites, flashes, quizzes, and so on.

***e-illustration*** The learners were inspired by browsing a full illustration of the field application. A flowchart of the process of the practical application was provided in which each step was set out with work instructions, standard procedure, and illustrated worksheets in multimedia format.

***e-workshop*** The students were always divided into different groups; within-group and between-group workshops were provided. A specific procedure for online discussion and presentation must be followed, and the trainer could guide each workshop to identify and illustrate useful knowledge resulting from the online collaborative learning.

## CONCLUSION

The proposed hybrid e-learning model integrates teaching-and-learning methods that have been found to be effective in the past in order to remove the limitations on time, location, and tutor’s availability that are imposed by a physical classroom. A year-long platform development in this research has proved an integrated application could be very effective but not necessarily expensive. In the IT structure, for the most part, common and existing software applications and infrastructures have been used so that costs were reduced. Moreover, the proposed hybrid e-learning model has produced useful digital content for e-learning. As all e-learning materials streaming on the platform were recorded and then reproduced digitally, a resource pool of e-learning content was produced that, has been found to be an important knowledge asset through many pilot training courses held in Taiwan. Hence, more guidelines for producing and managing applications for digital content are attractive.

In summary, after applying various learning theories in order to improve the teaching-and-learning process, it was found that there was a great opportunity to incorporate many of these learning theories into an integrated application. The further development of an integrated digital platform in this research has led to a successful hybrid e-learning model, and proved that there is great interest in integrating different learning theories into e-learning applications.

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