# Creating Flexible and Reusable Learning Resources

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## ABSTRACT
*This article describes a tailored made learning platform which emphasizes the sharing and reusing of teaching materials. Users can select any section of digital material to create synchronized learning materials without the need for any sophisticated software packages. The unique features of the learning platform and the feedback from seventy eight pre-service teachers who have had hands-on experiences are discussed in detail. The participants are very positive regarding the functionalities and capabilities of the learning platform, though only a quarter of them used it to create learning materials as part of their assignments. This finding suggests that there is a need to take into account matching pedagogies when implementing new initiatives.*

## 1. INTRODUCTION
The Internet has made a huge difference to our daily lives ever since it rapidly gained popularity in the mid 1990s. Using the Internet, people around the globe are able to connect with each other and have access to a vast amount of information within seconds. The flexibility of Internet access has had a substantial influence on education (Gaspar & D, 1995) whether for complementing face-to-face lectures or for delivering courses completely online (Harasim, 1999; Hiltz & Wellman, 1997). The flexibility of online teaching and learning lies with its accessibility and time and pace independence. Indeed, most higher education institutes recognize that incorporating technology into the classroom was the "the single most important issue" over the next few years (Carlson, 2000).

Many universities use online learning platforms (Boggs & Shore, 2004; Freeman, 1997; Palloff & Pratt, 2001) to assist course delivery. Despite their popularity, most learning platforms do not allow the same resources to be shared between multiple courses. Similarly, the teaching materials uploaded or created for a lesson cannot be reused for another course during the same or the following semesters. The limitations can be very frustrating to academics, and the problem is exacerbated when only a part of the learning materials is required for reuse. Another problem with existing platforms is that they do not support mixing and matching files of different formats. Teaching materials such as videos and slides are played independently and users are only able to browse the materials one at a time.

In view of the limitations of existing platforms, we have put forward a grant proposal and developed a platform, named PILOT (Promoting Interactive Learning in an Online environmenT) to tackle these inadequacies. PILOT allows users to use and reuse uploaded materials on demand, to select segments of materials, and to synchronize various formats of teaching material. However, it is not intended to replace face-to-face classroom interactions nor existing learning platforms. In fact, the goal of developing PILOT was to enable our student teachers to have an authentic experience of using different platforms and to make it easier to create synchronized learning resources from existing resources.

## 2. FEATURES OF PILOT
Producing good teaching materials requires a considerable amount of time, effort and financial commitment. It would save a significant amount of human and computer resources if materials could be reused. PILOT is more than a learning platform, it is a resource repertoire which enables users to tailor learning resources using simple steps using an existing pool of resources. The platform consists of five areas, namely, material, presentation, quiz, forums and personal information.

If a person wants to create any online resources using PILOT, he/she must have an account to log into the system. After successful login, the user can choose any materials in the materials section that have been uploaded by other users.

Alternatively, the user can upload any multimedia format or PowerPoint format materials which can be designated as "shared" or "not shared" with other users. Research into multimedia and related instructional technologies over the years has indicated positive effects on learning (Hede, 2002). Moreover, learning in multiple modes is more engaging due to increased learner interest levels, and learners are stimulated by sounds and images (Jonassen, Peck, & Wilson, 1999).

Many existing platforms do not fully utilize the capability of multi-tasking computer resources as these platforms are mainly designed for sequential processes. However, PILOT users can subscribe to one video file and one PowerPoint file or slides created by Slider Editor to form a *presentation* which displays two synchronized files. The Slide Editor not only enables users to type information directly on it but also to copy and paste HTML materials into it.

When creating a *presentation,* the creators are only required to input or get the start time/end time from the video and select the appropriate PowerPoint slide for that time interval, and a section will be created (a slide with the related video interval). That means the unwanted slides or video sections could be skipped. For example, the user can select 5 relevant slides from a 15 slide PowerPoint file and select 5 matching video sections of varied duration from a video file to form a *presentation.* Hence, *presentation* creators can construct the presentation materials according to the intended usage and their background. When a learner watches a *presentation*, he/she can watch the presentation sequentially or to select the interested section and the corresponding video time and slide contents will be displayed (Fig. 1). The advantages of displaying two files concurrently include the complementary synergy of information and to further prompt and stimulate learners to think whilst watching video content. Thus, the intended learners can have full control of the time, place and pace of viewing a presentation. Furthermore, they are provided with additional flexibility such as in selecting or revisiting any section of the video at any time.

Similarly, a user can create his/her own quiz or subscribe to another's' quiz in the quiz section. The user can specify when the quiz will be displayed anytime

Figure 1. A presentation which is synchronized with video and PowerPoint file

*Figure 2. Synchronize questions with a "Presentation"*
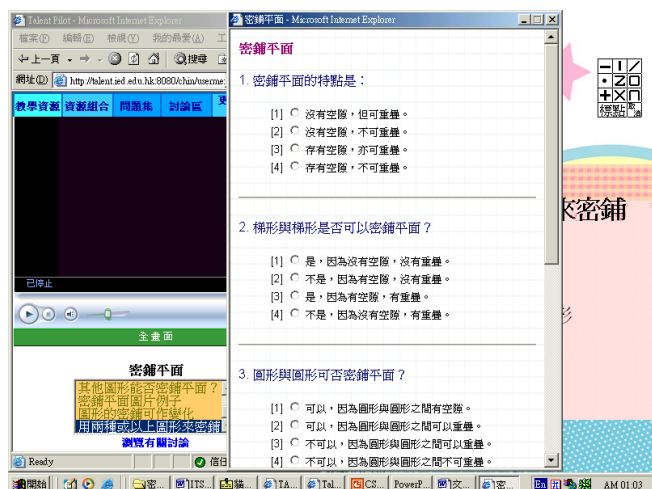


during the *presentation* display. This flexible approach aims to promote active learning and enable interactivity with the material, as an essential combination in determining the extent of learning is the actions and interaction of the learners (Laurillard, 2002; Oliver, Omari, & Herrington, 1998).

The *discussion forum* is an arena for exchanging and discussing pertinent problems and to form a learning community (Scardamalia & Bereiter, 1996; Tu & Corry, 2002). When a new *presentation* is created, a new thread can also be opened in the forum. Learners can share their comments and raise questions about that *presentation* when browsing or whenever they are logged into PILOT. Finally the personal section enables users to change passwords.

## 3. A STUDY
### 3.1 Background
The study took place at the Hong Kong Institute of Education (HKIEd) which is the largest teacher training institute in Hong Kong. We have recently adopted the Blackboard platform in order to facilitate learning, but none of its programmes are offered completely online. The participants of this study were pre-service student teachers studying at HKIEd taking a module called Information Technology Supported Learning Environment (ITSLE). They took the module in their second year after taking two other information technology modules. The participants had to attend a mass lecture and two tutorials per week. The learners had some hands-on practice with popular IT software and had knowledge of some popular ITSLEs. It was believed that the concept of ITSLE would be best learnt through modeling the concepts by adopting IT as a learning environment. All the teaching materials were posted on the Blackboard learning platform which they had to familiarize themselves with during the first tutorial session. The mass lecture mainly covered ITSLE theories and examples.

### 3.2 Data Collection and Discussion
The learners were given a brief introduction and demonstration of PILOT during the fourth week of the tutorial sessions. The participants then followed the instructor to create a synchronized *presentation*. They were also given an online user manual and a hardcopy to follow the procedures and to scaffold their learning (Oliver, Omari, & Herrington, 1998). They used the platform for about 50 minutes. Upon completion, they were prompted to answer an online questionnaire which was divided into three areas, namely, fostering learning, the user interface, and system functionality.

The results were encouraging as the least rated question showed a 66% agreement or strong agreement with value. Most of the respondents (98.72%) believed that PILOT provided a comprehensive learning environment, followed by (97.44%)

who responded that it had a consistent interface, and (93.59%) indicated that it flexibly enabled users to edit and use teaching materials. Although learners were positive concerning the questions that PILOT could foster active learning and develop independent learning, there were some other diverse views. This was probably due to the fact that they did not use the platform long enough to appreciate all of its functions. Even though they rated highly on the consistence of the user interface, one third of them did not find the platform easy to use. One plausible reason for this was that they did not have sufficient time to fully explore and experience the system prior to answering the questionnaire.

## 4. CONCLUSIONS AND FUTURE DIRECTIONS
The Internet has transformed teaching and learning, from being bounded by physical and time limitations, to learning at the discretion of learners. PILOT learning platform not only provides general e-learning features such as teaching materials management, discussion forum, quizzes and user tracking but also facilitates material sharing and reuse. The simple click and pick function of the platform has escalated different learning materials from a one-to-one relationship to a more flexible many-to-many relationship. The distinct features of the PILOT platform not only enhance the efficiency and effectiveness of teaching and learning but also minimize server load, which results in higher performance.

Our student teachers appreciated the functionalities of PILOT but not many of them adopted the system to create *presentations*. This finding suggested that there was a great need to take into account appropriate pedagogical considerations when introducing new ideas and implementing new initiatives (Oliver, and McLoughlin, 1999). It will be interesting to compare the findings of this study with future results when we introduce PILOT over the following years. To ensure this is continued, however, there is a great need for continuous financial support so that the project can have a successful and lasting effect.

## 5. ACKNOWLEDGMENTS

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