

LTTS: A Course Management System for Online Inquiry Learning

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There is a wide variety of reasons for the notorious growth in distance education (DE) (Allen & Seaman, 2004) and these have been well discussed (Moore & Anderson, 2003). Universities can increase enrollments without increasing their physical plant requirements. They can reach out to audiences that would not otherwise be able to attend post-secondary education as well as to new audiences who would normally not attend that particular institution. For many, the online environment provides their only avenue to post-secondary education or professional development opportunities. Most DE learners are time restricted by work requirements or similar restrictions; those that cannot afford the residential or commuting costs, and those who are house bound with children, with a disability, or other constraints. A very large number of those taking online courses are “part-time” learners and young adults or adults (Tucker, 2003). Learners who are at a distance need ease of access, affordability, and greater flexibility in their learning environment.

Unquestionably one of the advantages learners perceive in asynchronous online learning (OL) environments is the possibility of benefiting from the “anytime and anywhere” options offered by DE. Nonetheless, while online courses generally offer greater flexibility and affordability than face-to-face courses, the use of a traditional course structure still places significant constraints on the learner. First, the anywhere anytime dictum is really restricted by the semester start and end dates and a syllabus that specifies the pace through the course. Thus flexibility is limited to the time within a day or perhaps the day within a week. If teamwork is involved, the scheduling demands increase all the more, frequently setting short deadlines for submitting contributions to a group effort and specific times for virtual group meetings. Thus traditional online courses save travel, but they do not necessarily provide the scheduling flexibility so often heralded for online courses because that seeming flexibility is at the end often limited by the semester framework, schedule, deadlines, group work, etc. But what is often most critical to DE learners is “any pace” instruction. DE learners, who in most cases are already in the work environment, need the flexibility not just to decide whether to work in the morning or evening, but they need to be able to take a week off when there are particular demands at work or perhaps compress work during a period of free time. Self-pacing is where the real freedom of the Internet rests. In the same sense, in online professional development too often ease of access refers only to the computer interface and bandwidth requirements of online systems. However, the bulk of accessibility issues rest with the commitment the learner must make to the professional development schedule and time requirements. Ideally, professional development would provide learners with just-in-time support for understanding new concepts and strategies and applying them in their own work environment. Professional development should be available as a learner needs it and has time for it.

Furthermore, making learning environments convenient and accessible isn't enough. Relevance and effectiveness is critically important, especially in the online context, and we have the challenge to convert our knowledge of how people learn into effective online learning environments and practices. As stated by Kali, Spitulnik, and Linn (2003), there is a need to begin to translate our knowledge of the learning sciences into effective software and instructional features. But in most cases online courses have a fixed content previously determined by instructional designers or instructors that is focused on “covering” content that may be relevant to the learner in general, but that commonly does not address particular

needs of the individual learners. Often what is learned are general strategies and principles, and it is then up to the learner to make the linkage to their own working context.

OL offers interesting potential for developing quality learner-centered (Duffy & Kirkley, 2004) and inquiry-based instruction (Garrison, 2003; The PT3 Group at Vanderbilt., 2003) in which the learner experience and needs, what the learner does and not what “the teacher teaches”, is at the center, and as distance learning grows, we are seeing an increasing number of courses and programs that offer students much greater freedom through extensive use of learner-centered problem solving and self-study approaches (Duffy & Kirkley, 2004). OL can also support the instructor’s ability to provide just in time feedback for the learners’ work, and to develop one-on-one mentoring strategies. Easy access to learning resources, and the possibilities for supporting communities of practice, also illustrate the enormous potential of OL (Barab, Kling, & Gray, 2004; Bonk & King, 1998). Without doubt all this requires appropriate course design and a Course Management System (CMS) that supports the inquiry approach, the self-pacing and the individualized mentoring.

LTTS (<http://ltts.indiana.edu>) is a mature and successful inquiry based online learning course management system that has taken upon the challenge of addressing the above discussed needs of DE learners and the opportunities of any-pace and inquiry-based DE learning. LTTS differs from other CMSs in that development was driven by the instructional goals and resulting course design, replacing the “bucket” interface common in DE, with a guided problem-solving interface reflecting a pedagogy supported by research. LTTS also supports individualized instruction and mentoring and it is in this context that most of the course management work has been undertaken. Our attempts to take seriously two instructional goals, flexibility and relevance for the learner, led to the DE approach described in this paper.

LTTS consists of authoring, facilitation, and administrative management systems; tools that make self-paced inquiry based courses with individual facilitation possible. While the original set of courses are for teacher professional development, any content area where the learning can be framed in terms of issues or problems could be used in LTTS. The system has been operational for three years and there is a wealth of evaluation data that support the appropriateness of the approach for web based DE (Duffy, Kirkley, del Valle, & Malopinsky, 2004; Wise, Chang, Duffy, & del Valle, 2004). Thus, we think this alternative DE course design and CMS may be of use to many organizations interested in DE but also be of general interest in that it offers a vision to administrators and researchers as to what DE can be.

The LTTS Learning Environment

LTTS offers an online professional development curriculum that has a catalogue of 60 courses that address technology integration in learner-centered teaching. Going beyond the traditional course structure and learning approach, LTTS has moved the courses out of the semester framework and fixed pace, promoting learner engagement using an online adaptation of inquiry and problem-centered learning (Malopinsky, Kirkley, Stein, & Duffy, 2000; Savery & Duffy, 1996). Courses are short (between 25 and 30 hours), entirely web based and self-paced, but learners have a limit of 84 days to complete the course (self-paced instruction with a deadline). Of course, self-pacing means that there is typically not a cohort involved in a course – learners work on their own, although it is also possible to set up group courses. However, learners are individually mentored in a cognitive apprenticeship framework, working in a non-linear, resource-rich environment with an open-ended structure. The outcome is a student-designed product to use in his/her professional work.

When a learner enrolls in an LTTS course, a mentor is immediately assigned. A course begins with the presentation of a problem presented in text or through Flash animations. We view the learners’ engagement in the problem -- their understanding of the problem and taking ownership of the basic

approach to addressing the problem—as key to the success of the courses. It is an apprenticeship environment and if the learner is simply “taking” a course, the goal orientation essential to successful learning will be missing. For example, a curriculum problem for a teacher taking a course might begin with an animation that describes how students are overwhelmed with the number and types of resources they find when they are asked to use the internet and evaluate resources as they explore a topic. There are then a series of activities in which the student is given a task related to work on the problem (guided problem solving), guidance on the task, an array of resources to support that work, and a work drop box for submitting the work to the instructor (Figure 1). These tasks are similar to the guidance a manager would give an employee working on a long-term project, e.g., first establish your goals and the rationale for why that goal works for your context. The course is designed to be a work environment for the learner, thus there are no assigned readings. Indeed, rather than a minimalist approach to providing just the essential resources, LTTS provides a rich array of resources for the learners to use to encourage them to explore the resources, looking at different approaches or different discussions of a concept. The learner completes the course by creating a “solution” that address the problems initially proposed; a product that can be used by the learner and that is tailored to his or her own needs in a real work environment; in this case a lesson plan for the teacher’s classroom. Finally, the learner must complete an end of course assessment that consists of a series of reflective questions, but designed specifically for that course, and a self-evaluation of the final product.

TE401

Supporting Internet Exploration with WebQuests:

How do I design a WebQuest to meet my curriculum goals?
Author: [Carey Smith](#)

course home

My Workbook

ACTIVITIES

- ① [Explore WebQuests and establish goals for your WebQuest.](#)
- ② [Choose a topic and define a task for your WebQuest.](#)
- You are here ③ [Create the Introduction for your WebQuest.](#)
- ④ [Identify resources for your WebQuest.](#)
- ⑤ [Develop the task and process sections for your WebQuest.](#)
- ⑥ [Design the evaluation and conclusion sections for your WebQuest.](#)
- ⑦ [Consider additional issues critical to implementation of your WebQuest.](#)

Activity 3: Create the Introduction for your WebQuest.

Having identified your goals, selected a topic, and defined the student task, you can begin creating each section of your WebQuest. In this activity, you will build the Introduction section for your WebQuest.

Task and Guidance

The Introduction section provides an overview of the topic, the goals, and the task for the learners. Most importantly,

Figure 1. LTTS problem centered design.

Both discussion forums (for group work) and an internal email system (for mentor-student interaction) are available. The mentor offers encouragement, provides feedback on work, offers suggestions, and shares experiences. The primary point of interaction is around the evaluation of the work submissions. As the learner submits work, the mentor has the responsibility for promoting depth of thinking by asking probing questions that reveal the learner’s own assessment of the work in relation to the concepts, strategies and

skills being learned. Of course, when there is an evident disconnect between rationale and product, the mentor will in fact require learners to revise their work.

LTTS Mentoring and Support Tools

Too many excellent alternative OL programs are dependent on grant money to sustain their current level of effort much less to grow. Indeed, too many high quality professional development efforts end when the grant money ends. Thus we had a design commitment to scalable and sustainable environments with a focus on cost efficiency. In this context the cost of mentoring and the cost of materials development are critical. To determine development costs, we used cost modeling processes (Tucker & Kirkley, 2003) to document costs for each course. Thus, we were able to determine average costs for LTTS course development process. Data on mentoring costs comes from mentors tracking their time.

Clearly the greatest cost for scaling LTTS is in the mentoring process. Our data indicates that it requires approximately only 3.5 hrs to mentor each learner through a course, probably much less than could be expected. A major design goal was to develop strategies that will reduce the mentoring time without impacting the value of the mentor to the student. One of the primary strategies is to support the mentor in tracking and responding to learners. We have developed a multi-featured mentor interface (Figure 2) that includes the ability to:

- track all learners and their work in a single window,
- navigate course content, mentor comments, and learner work in two parallel frames,
- use pre-defined messages to provide the grounding for personalized messages and feedback with an editable, menu driven system.

Mentors can manage 30 students in different courses on a half time basis using the three LTTS mentoring tools. In this “learner tracking system” the work related to each learner is represented in one line (see Figure 2). The line provides learner name, the course he is enrolled in, days to completion, work submitted and date submitted, date mentor responded to the work, last login, and last message sent by the learner and the mentor. Thus, the mentor can see at a glance how far the learner has progressed in the course, how much time is left, if the learner has been active recently, and what work the mentor has to do. In addition the mentor can take notes on the course to guide revision and facilitation and take separate notes on each learner as reminders for future interactions. Finally, clicking on any item will take the mentor to the database of learner work for that particular item. This monitoring system is an example of a strong collaborative design process with the mentors providing ongoing input on revisions needed to improve their efficiency.

The two-frame navigation system supports the mentor in grading and reviewing work. When a learner submits work, the mentor can bring that work up in one frame while looking at the grading rubric, the course content, the student’s prior work, or the mentor notes in the other frame.

The early experience in mentoring allowed us to identify common kinds of feedback to learners. Somewhat standard interactions occur with learners at the initiation of the course, when the learners have not logged for several days, and in providing feedback on work submitted. A set of 21 messages has been prepared for those situations. It is seldom the case that the message is adequate by itself, but the mentors can select it from a menu and it provides the core of the message, which they then personalize. Providing tools to scaffold and support the work of mentors is one way that LTTS achieves scalability. By making the process of mentoring a more visible and supported process, mentors are able to more effectively assist learners and track their progress.

For more resources

click here -> <http://www.uwex.edu/disted/conference/>

GROUP PROGRESS REPORT													
Demo Group													
Learner	Credit	Days left	Course	Act. 1	Act. 2	Act. 7	Final Solution	Assess	Close-out	Research	Last Course Access	Last Discussion Posting	Last Messenger Posting
Dean, Eric Message Notes Remove From Group	CRU	27	TE301	308nbspJan	308nbspJan		308nbspJan	P L E		no consent - - -	30 Jan		30 Jan
Lopez, Gerardo Message Notes Remove From Group	none	27	TE003	298nbspJan	298nbspJan					no consent - - -	29 Jan		29 Jan
Marconni, Anthony Message Notes Remove From Group	CRU IU	27	MA101	278nbspJan 28 Jan	278nbspJan 28 Jan	278r 28	298nbspJan	P L E	23 Mar	no consent - - -	29 Jan		29 Jan
Price, Susan Message Notes Remove From Group	IU	27	TE404	298nbspJan 30 Jan	298nbspJan					no consent - - -	29 Jan		29 Jan
Price, Susan Message Notes Remove From Group	CRU	27	SC202	298nbspJan	298nbspJan	298r				no consent - - -	29 Jan		29 Jan

Legend:

- ◆ 02 Feb - facilitator feedback needed
- 4 - less than 7 days left
- ◆ 02 Feb - learner's posting
- 02 Feb - facilitator's posting

Figure 2. Student tracking system used by facilitators.

The LTTS catalogue of courses would not be possible if we had to write and update all of the course material. The strategy has been to limit the writing to creating the course structure and guidance and providing external resources as primary content. As part of the course development we identify websites that are relevant to the problem and that have quality content. Additionally we developed the necessary tools to keep them up to date (automated link check and database driven resource information and descriptions). Therefore while there was considerable planning and analysis underlying the course, there was actually very little actual content development. There is some increased effort involved in link maintenance but it is minor compared to the expense that would be incurred in writing all of the material.

Finally, most recently, we have introduced a web based conversational agent to off-load mentoring work. The agent is not intelligent, but rather is programmed with motivational, informational, or instructional information. The agent is triggered by monitoring the student's click stream data. Thus, any particular action or sequence of actions can be defined as the trigger for an agent guiding statement. We expect that further development of the agent will also contribute to make this online curriculum and CMS a scalable and sustainable environment.

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Biographical Sketches

Rodrigo del Valle, originally from Chile, is an experienced educator who has worked on the use of technology to support learning for many years. He was head of educational resources at the Chilean nationwide educational technology program (www.redenlaces.cl) and was national coordinator for the World-Links for Development program (www.world-links.org). He has facilitated more than 30 different online courses, and worked on the development of innovative online learning strategies. He is currently working at the Center for Research on Learning and Technology at Indiana University.

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Thomas Duffy has a long history of work in DE, with over 30 articles on DE and at least as many presentations. He recently was co-editor of, "Learner-Centered Theory and Practice in DE" with Jamie Kirkley. He currently is directing or co-directing four distance learning projects: LTTS, an evaluation of the Cisco Networking Academy, a project with Azerbaijan to develop DE capability in the country, and a project to look at the design of a support structure for learner centered teaching in higher education.

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