Virtual Teams in a Synchronized Visual Learning Environment: Experiences of an Adjunct Learning Facilitator

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Abstract: This conference paper documents the experience for virtual learners in a Visual Learning Environment. A guided experience will be illustrated eCollege and Elluminate revealing an online learning environment for students at National University. This paper explores how synchronized lessons can support problem solving in information age using two case studies. The broader context of best practices in the industry is adapted for facilitating web enabled hybrid online courses. The scope includes integration of synchronized and asynchronized teaching environment covering the technology, pedagogy and context of learning outcomes for accredited academic degree programs. The ideal audience is faculty and program coordinators for online course delivery. Participants will receive a CD with an audio recording of the session, a set of example virtual team papers and joint presentations, and a copy of the story-board PowerPoint slides.

Introduction

A key recommendation for the State of Hawaii is to "[s]ystematically examine how two-year and four-year programs at UH and in the private universities can better meet industry needs, either through the expansion of existing programs or the development of new programs" (HISciTech, 2008, p. 62). This mandate means activating a diverse technology base to take advantage of emerging opportunities which increases networking across industry sectors. This paper and guided experience focuses on application of best practices for adult education delivered by distance learning technologies. It is believed that access to relevant and realistic education in high tech skills for working together within virtual teams is instrumental for the workforce future.

In April 2008, when presenting a seminar on rapid prototyping at a conference in San Diego for National University, the author was contracted to facilitate several online courses for the School of Computer and Software Engineering. Years of experience in the high tech industry performing systems development was a context of understanding about agile methods and industry best practices. Often the project teams were geographically disbursed. This direct industry experience was useful to enhance live lectures, prepare lessons plans, compose assignments and adapt the courseware into meaningful experiences that fulfilled the mandate to achieve the learning outcomes of the university's

accredited programs for distance learning modality. Two case studies were referenced to prepare this experience of an online learning using web-based Visual Learning Environment (VLE) and a Learning Management System (LMS).

The first case study covers a cohort of graduate students earning a Master of Science as Data Base Administrators. The specific course was an overview of Enterprise Data Management delivered first in March 2008 for a synchronized schedule using iLinc with a FTP site as a repository for shared documents. In November 2008, the same course was re-configured as a hybrid using Elluminate for live chat and a LMS called eCollege for asynchronous threaded discussions, a repository for shared documents, exams and a grade-book. A key assignment required a small team to perform research for a vendor analysis. The virtual team was to explore alternatives and influence a decision to purchase software, develop it or do nothing. The learning outcome supported was "Understand the basics of pros and cons of ERP systems for implementation planning." (Lauridsen, 2008a).

The second case study covers undergrads enrolled in an introduction to Management Information Systems. The text book publisher provided pre-recorded audio lectures. Having this baseline instructional material for independent study allowed the instructor to provide an enriched experience during live sessions. This enabled applying best practices to maximize the experience of collaborative learning. A key assignment required researching business case studies for follow-up threaded discussion. The syllabus published an instructional methodology and philosophy statement in support of collaborative learning. "We will utilize a number of instructional methodologies including and not limited to online lectures and presentations, online discussions, case reviews, audio and video presentations, question-answer sessions, self and instructional assessment, online research, and problem solving. One group project will be accomplished using a virtual team approach." (Lauridsen, 2008b).

Method

The method used to prepare this conference presentation was to capture relevant screenshots from archived sessions and arrange them in PowerPoint as a draft story-board. It was beneficial to be guided by Evan's discussion of collaborative work, active, exploratory, inquiry-based learning, and critical thinking and informed decision making (Evans, 2007, p. 128). A story-board method was used to plan for an experiential session reflects the 12 steps for "Transitioning to the Web" (Evans, 2007, p. 132).

In Table 1, the arrows provided by the author highlight the five specific areas of interest for building virtual team skills for the new learning environments.

Table 1. Traditional and New Learning Environments (Evans, 2007, p. 128)

Traditional Learning Environments	New Learning Environments
Teacher-centered instruction	Student-centered learning
Single-sense stimulation	Multi-sensory stimulation
Single-path progression	Multi-path progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active/exploratory/inquiry-based learning
Factual, knowledge-based learning	Critical thinking and informed decision-making
Reactive response	Proactive/planned action
Isolated, artificial context	Authentic, real-world context

Table 2 is a table of contents for the presentation story board slides which adapts and extends Evan's list for instructor initiated classroom activity. Items 1 through 12 originated from the left column of "Transitioning to the Web" (Evans, 2007, p. 132). Evan's suggestions were a practical context for setting the stage for an experience for virtual learning experience which consolidated the two case studies. [1]

Table 2. Case Study Story-board

Instructor Initiated Classroom Activity	Cross-reference to story-board
1. Welcome letter announcement or e-Mail, publish syllabus with learning outcomes and session/meeting schedule	3 slides showing Welcome, syllabus and calendar.
2. Receive email confirmation, process check-in postings	3 slides showing email replies
3. Assess previous knowledge and/or prerequisites, readiness and motivation to be engaged in a learning opportunity	Q&A frames with shared results
4. Warm-up quiz to gather level of previous experience and learners' awareness the courses learning outcomes	Q&A frames with shared results
5. Post facilitator introductions and set expectation to share learners profile and bio statement	Example postings with Bio Statements.
6. Request/receive feedback (beginning, midterm, end of course) during live sessions	Example images of feedback during Class Life sessions. [Audio sound byte]
7. Request peer review of learners' work posted to threaded discussions	Example images of postings

[1] The PowerPoint file does contain more content than will be covered during the hour long session at the conference. Content with detailed notes will be saved on the CD to be sent to participants.

8. Formalize virtual classroom protocol, guidance for communications, postings, drop box, threaded discussion, attending a-synchronized discussion, email etiquette	Several slides illustrating effective use of eCollege
9. Announce agenda for each scheduled chat and synchronized virtual meeting, then follow-up with a status report and action items.	Images of Class Life sessions and whiteboard meeting agenda and status report posted to /Shared Docs\
10. Post progressive announcements in the virtual class room for actions, suggestions, status, changes of assignment or schedule, status of progress on the original learning outcome.	Images of progressive eCollege announcements
11. Build a set of external links and/or Webliography for extra learning, research, curiosity	Images of URLs loaded into eCollege /Webliography\ and of an exhort of the list into Excel
12. Build repository of shared documents distinguishing required reading and supplemental	Images of eCollege accessing categories of documents uploaded by teacher for lessons and by students for assignments.
13. Offer constructive feedback to assignment submitted early, in time for a revision to be posted. Encourage peer feedback during individual and group presentations using shared desktop.	Image of feedback form and copy of saved text chat following a student presentation.
14. Explain rubric and scores for progressive assignments mapped to grade book.	Example of rubric.
15. Score exams promptly, explain answers that did not receive points.	Images of setting up and scheduling an exam and scoring it with feedback to students
16. Demonstrate research skills for locating, qualifying high tech information on eJournals to be cited in VT assignments.	Images from day one lecture on research skills for effective use locating reliable information.
17. Set a context scenario problem-based learning resembling real-world problems.	Example assignment instructions.

Educational pedagogy was originally researched using previous years TCC conference papers. This was followed by researching into articles and dissertations from the e-Library at the University of Phoenix. Next, the story-board file was expanded to integrate the lessons on pedagogy for distance learning. Lastly, survey results from online students were summarized to substantiate the educational theories. This step tallied results of threaded discussion by about 60 students in six courses according to the categories defined by Ben, Schweir and Ross. The content assembled was suffiencient to conduct a day long interactive seminar; so, it was re-arranged and condensed to the focus on effective use of a VLE to develop the talents of working within virtual teams.

Best Practices Industry Teams

Practitioners in the high tech industry are alert to the reality of projects being staffed by the best available talent. Team members are assembled into virtual working teams which operate across geographical boundaries. Traditional face-to-face requirements for communications are adapted to use web conferencing, virtual meetings, instant messaging and a high volumn of emails. Industry projects are progressive and identified by a specific deliverables that is results-oriented based on a fixed timeline. Work is performed by teams which are either co-located or disbursed or a combination. For example, one project may establish the infrastructure for database technology and network architecture upon which followup work depends. Success triggers a next project to deploy a database with transformed data. Then, work proceeds on developing a web user interface. For a fast paced agile environment, team resources are assigned to tasks according to trained skills. The Project Manager orchestrates the dynamic allocation of resources based on skill, availability and the careful integration of results.

This mode of working can translate into lessons during online course that simulate real world project teams with learners in different locations and time zones.

Best Practices Instructional Theory

Learners enrolled in on-line courses are also full time workers. They often reflect an ambition to gain technical skills perceived to increase success. In this new market, organizations are moving toward decentralized structures. Outsourcing contractors offer services to build software products using cost savings methods and global pool of labor. Virtual project teams assemble to accomplish work that is carefully scoped and then disengage so that the available talent can be reassigned. People without skills are released. Those with relevant skills are retained and move onto a next project. Project success is evaluated by results in terms of business bottom line. The influence of the industry is impacting the learning outcomes for online courseware.

According to Caudill (2007), learners reflect the culture that "demands different pedagogies … most apparent in asynchronous online environments, situations where students post to a common area to exchange information" (p. 187). Caudill acknowledges the constructionist learning theory and emphasizes that the technology is not an end in itself; it exists to facilitate the learning experience. This phenomenon as evidenced by partnerships of corporate entities and higher education and recognizing "increasing demands that students exit a degree program with technical skills" (p.191). Acquiring pure technical skills is not sufficient for survival in the dynamic teams of today. People skills serve to integrate performance for achieving complex deliverables which are often very costly when there is a failure late in the life cycle.

Practice in virtual team skills is enhanced when the teaching tools resemble web enabled collaborative tools used in the industry. Caudill indicates that the fasted growing category for online courses is career and technical education (p.188) with demographics being age 23 for on-campus and age 37 for on-line (p.189). Three elements distinguish learning:

instructional methods, instructional media and media elements. E-Learning tool designers use media elements in a the VLE as icons, special effects, control features, and frames that enclose a whiteboard, text chat that resembles instant messenger software. VLE objects serve to substitute for face-to-face experiences in a classroom. The tool vendors include these design objects as a form of achieving immediacy between the teacher and learners.

By following best practices from published guidelines, designers of e-Learning build courseware that delivers on planned performance results. Course writers facilitate building certain skills that can be relevant to career progress. Often these skills are for solo learners to adopt and prove using ordinary academic assignments or exams. Clark & Mayer (2003) suggest that following guidelines will have a positive effect on motivation and student retention. According to Clark & Mayer, too often e-learning courseware fails to identify performance goals. Learning outcomes named in course catalogs needs to be translated into the delivery of the content using live lectures followed by involved instructor-student discussion. Active rather than passive E-learning courseware that is learner-centered rather than content-centered is responsive to the questions asked and answered by participants during live sessions. New information should be presented in a context of learners' awareness from previous courses in the established sequence toward the degree. Curriculum guidelines ensure that a comprehensive learning agenda of content often measure objectively with exams and rubrics for papers submitted. Scenarios which closely resemble real-world problems offer a more subjective experience of problem-based learning for skills relevant to virtual team performance.

Quality Online Learning Experience

According to Mentis (2008) there are three zones for e-learning environment: technology, pedagogy and context. His research is composed in a framework call the e-Learning Alignment Guide (eLAG) and illustrated by the following diagrams, adapted for the story-board for the topic of maximizing virtual team communications.

Figure 1 highlights the design of sophisticated online courseware that moves away from the paradigm of one way communications toward interactive dialogical teaching and learning. The old paradigm is monolog style lectures with student listening and taking notes. The new paradigm is interactive and conversational.

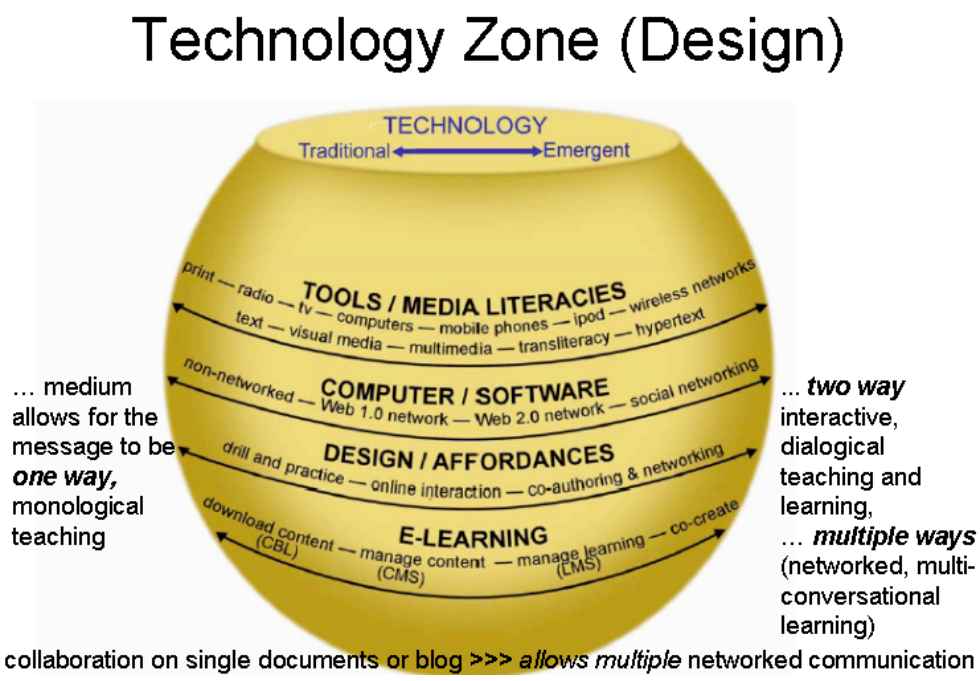


Figure 1. The technology zone of the eLAG (adapted from Mentis, 2008, p.219)

The next figure 2 highlights the pedagogy for teacher & learner in which the student is no longer passively engaged in downloading information but is becoming self-directed and comfortable with all the media, technologies of the digital age, and who is an active and collaborative member of a community of learners. This is an ideal outcome for quality online learning experience for collaborative teams.

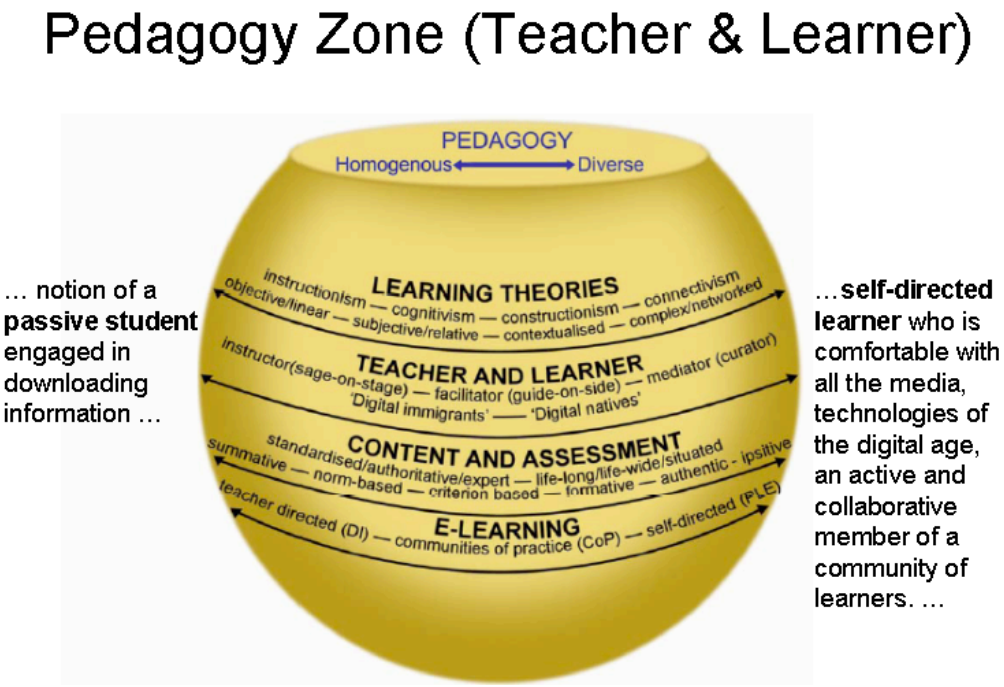


Figure 2. The pedagogy zone of the eLAG (adapted from Mentis, 2008, p.221)

Figure 3 highlights the context zone for the e-Learning as a movement away from formal structured literacy toward informal, innovative and media-rich educational experiences.

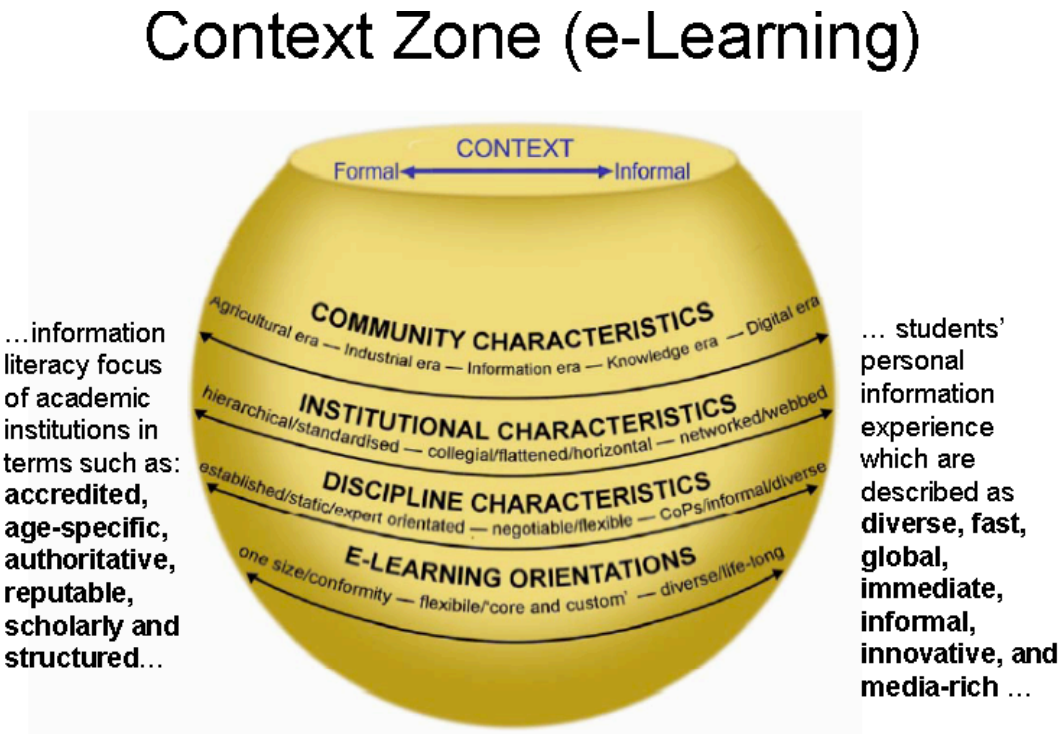


Figure 3. The context zone of the eLAG (adapted from Mentis, 2008, p.223)

According to a Rubric for Online Instruction, high quality online courseware includes criteria by which courseware can be evaluated (ROI, n.d.). The criteria includes: 1) learner support and resources; 2) instructional design and delivery; 3) innovative teaching and technology; 4) online organization and design; 5) assessment of student learning; 6) faculty use of student feedback. For a rubric for evaluating courses design and delivery, Table 3 shows the five criteria by which the quality of courseware can be measured as meeting a baseline, being more effective or being exemplary. Underscores are provided by the author to emphasis the area of interest for building virtual team communications.

Well chosen text books for online courses cover the baseline material for delivering the content for distance learners. Publisher provided instructor supplemental kits offer time savings lectures, exercises and prepared exams which are effective for consistency and completeness in covering the learning outcomes. A talented facilitator still needs to prepare, to motivate the learners and to offer exemplary level of success stories.

Table 3. Five criteria in which courseware can be measured (adapted from ROI, n.d).

Baseline	Effective	Exemplary
A. Course offers limited opportunity for interaction and communication student to student, student to instructor and student to content. B. Course goals are not clearly defined and do not align to learning objectives. C. Learning objectives are vague or incomplete and learning activities are absent or unclear. D. Course provides few visual, textual, kinesthetic and/ or auditory activities to enhance student learning. E. Course provides limited or no activities to help students develop critical thinking and/or problem solving.	A. Course offers some opportunities for interaction and communication student to student, student to instructor and student to content. B. Course goals are defined but may not align to learning objectives. C. Learning objectives are identified and learning activities are implied. D. Course provides some visual, textual, kinesthetic and/or auditory activities to enhance student learning. E. Course provides some activities to help students develop critical thinking and/skills or problem-solving skills.	A. Course offers ample opportunities for interaction and communication student to student, student to instructor and student to content. B. Course goals are clearly defined and aligned to learning objectives. C. Learning objectives are identified and learning activities are clearly integrated. D. Course provides multiple visual, textual, kinesthetic and/or auditory activities to enhance student learning. E. Course provides multiple activities that help students develop critical thinking and problem-solving skills.

Demonstrating Virtual Meeting Skills

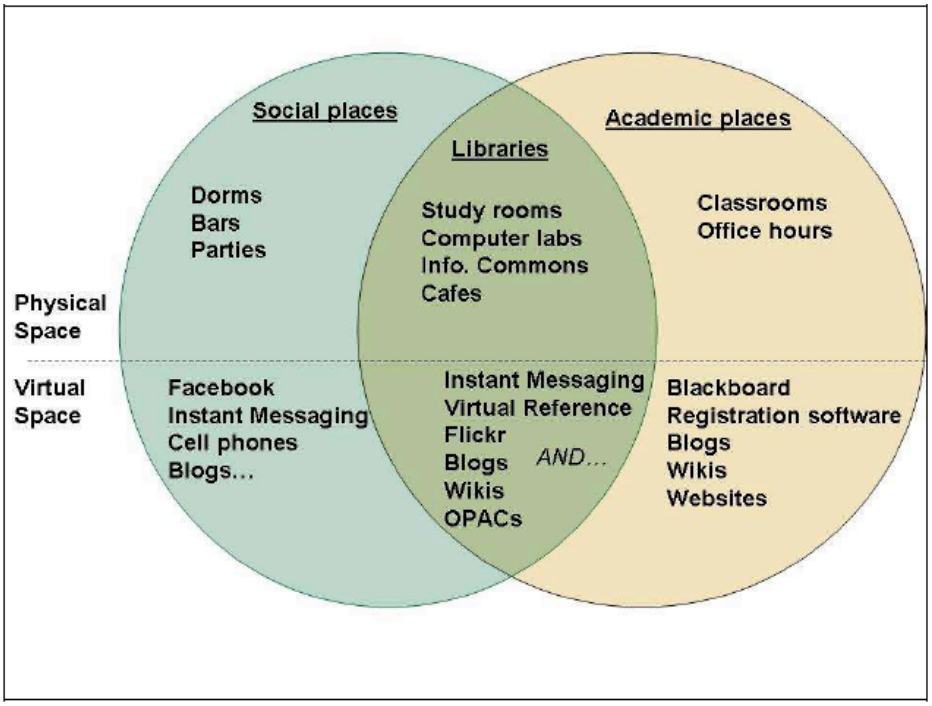
For high tech online courses, the demographics of the learners are distinct from traditional in academic degree programs. The course content is not dependent on traditional Face-to-face (F2F) skills associated with traditional classrooms in which small groups can pull chairs together to have immediacy to brainstorm problem solving during a schedule event. An important team skill is to assign roles and execution of the task to gather relevant information. Virtual teams (VT) brainstorm without a F2F opportunity and a shared whiteboard to focus attention. VTs brainstorm using instant messenger, emails, phone calls or web-based conference tools.

To overcome obsolete information in some published text books, facilitators for online high tech courses often find recent ideas and facts in the electronic industry trade journal web sites. In these eJournals, bloggers write daily columns on the latest trends, product reviews and best practices. Often these authors express opinions that can only be trusted to the extent that ideas and facts can be validated by multiple sources. It is up to a good researcher to perform due diligence when verifying opinions, even those expressed by credible people. An online facilitator will suggest sources of information used by real world projects and demonstrate a method to quality those sources.

Lists of interesting web page addresses are often collected to enrich the original course content and be responsive to student's curiosity and to suggest sources of information for critical thinking for meaningful team assignments.

According to the LASSIE project, the term 'social software' is hosted remotely and describes collaborative environments that facilitate resource sharing, communications for users to add content (Secker, 2008, p. 3). Web2.0 is one of the enabling technologies. Going beyond tools for literacy used by librarians, Secker discusses ideas for educationalists and learning technologists to be engaged with social software and tools such as blogs, Wikis and RSS (real simple subscription) feeds as new ways for online groups to work collaboratively (2008, p. 6). Citing numerous sources Secker expands upon the themes of collaborative tools demonstrated by social networking attitudes and tools.

According to Secker (2008) subjects are now taught in small groups, collaboratively on joint projects (p. 19) and the role of librarians is to facilitate collaboration and communication in the Web 2.0 world (p. 21). Figure 4 illustrates an overview diagram of Library 2.0. This indicates a shift of paradigm from rooms above the line toward using virtual web meeting tools below the line. Today's online students are proactive users of social networks such as Flickr, LinkedIn, and MySpace. They expect to use Instance Messaging and texting to communicate with each other about assignments. Online facilitators should grasp the opportunity and endorse use of these tools for learning teams.



From Michael Habib's Flickr site (Licensed under Creative Commons):
http://www.flickr.com/photo_zoom.gne?id=222296001&size=o

Figure 4. Integration Physical and Virtual Space (from Seaker, 2008, p.8)

Facilitating Discussions

Roper (2007) expounds on making the most of online discussions which allows students to talk to each other asynchronously. As a shift away from direct conversations during in-class courses, this provides "an opportunity to develop richer discourse by means of written discussion that allows students to spend time crafting their responses" (p.173). Asking questions is an integral part of learning and corresponds to virtual team meetings during which agreement is made about tasks to which the team has committed its effort. Whereas virtual teams use many emails, virtual learning teams can retain persistent threaded discussions in a controls repository on a LMS repository.

Heckman & Annabi (2006) discuss the traditional course in which the teacher represents having the expert knowledge and provides guidance and suggests attention be given to "the attitudinal and motivational predispositions students bring to the educational setting" (p.146). This guided forum expands up upon these authors' suggestions to "explore the rich, but relatively untapped, potential of a narrative-based pedagogy in asynchronous learning networks" (p. 149). Like Mentis (2008) is Figure 2 above, Heckman & Annabi highlight the opportunity to experience team dynamics as a community of learners that include active participation by the teacher. During the live session we will compress the experience of asynchronized discussion into a few minutes so that we will see postings build quickly as if happening over a period of days.

DeNeui & Dodge (2006) discuss use of a LMS called Blackboard as an interface for discussion, exams, and shared documents. They indicate that formal studies prove that frequent users of a tool perform better than those who are new to it (p. 260) but confess that the research is sparse.

Digital Resources for Collaboration

Synchronized discussion enhances chat during scheduled live learning sessions. This builds immediacy for team to function effectively. Ben, Schwier and Ross argue that incidental discourse, outside of required content, plays a significant role in "building a sustainable learning community, whereby individuals extend interactions beyond classroom/required content (2007, p. 471). Engagement outside class supports learners in making connections which enables a sense of community. Virtual Learning Community (VLC) are bounded by time and the formal boundaries of the course, however, individuals can build a level of social networking that extends beyond the schedule assignments. For the activity of threaded discussion in an asynchronous environment, a tally of the variables of for the thread discussion substantiates the findings of Ben et al. See Figure 5 for frequency of observations of discourse variables in a VLC highlighted by the author for five areas of interest for learning team participation. Example discussion question (DQ) questions with both intentional and incidental postings are included in the story-board. Both these summary charts confirm a bias for incidental sociability discussion (1375), observations (409) and shared experiences (352) rather than intentional researched explicit information (395) evaluation (127) or summation of information (20). Figure 6 marks the areas of interest for online teaching of teach skills.

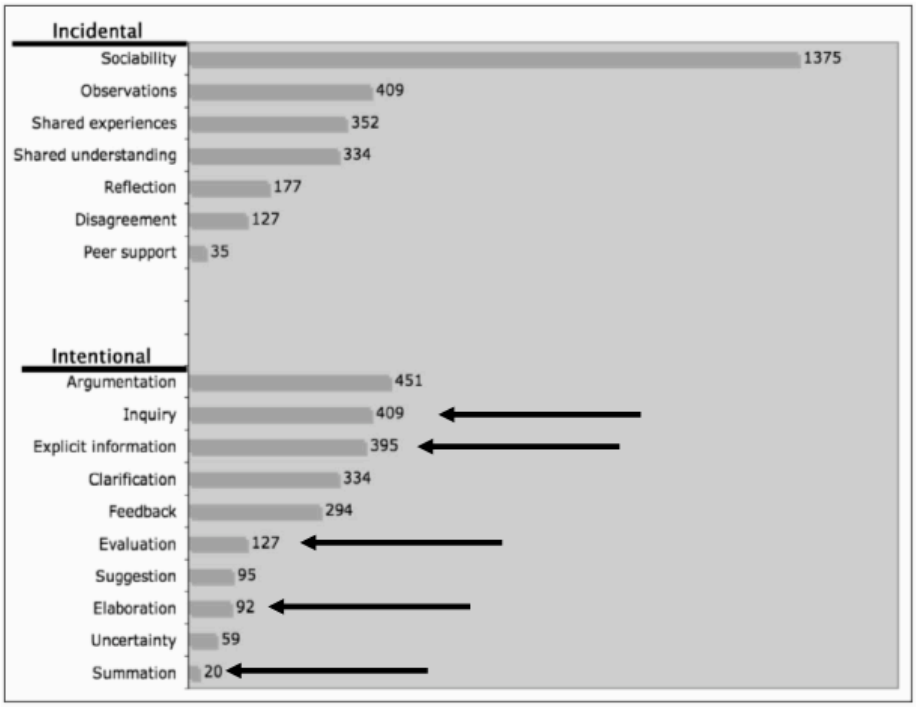


Figure 5. Observations of discourse variables in a VLC (Ben et al, 2008, p.471)

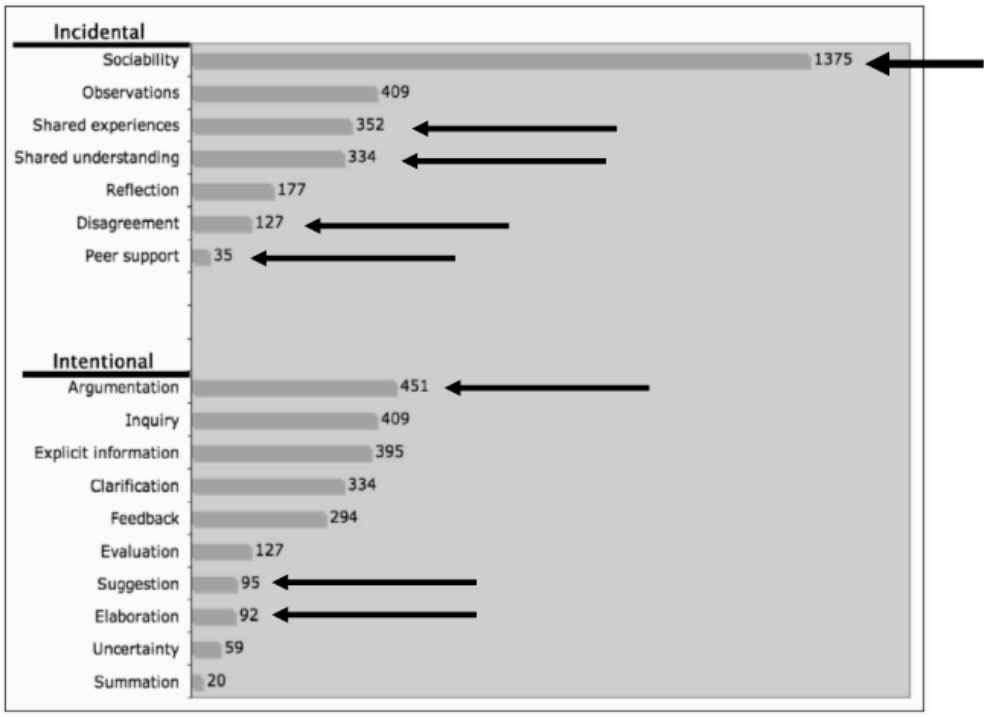


Figure 6. Observations of discourse variables in a VLC (Ben et al, 2008, p.471)

Ben, Schwier and Ross (2008) correctly distinguish incidental from intentional objectives. It is a smart idea to allow incidental discourse a measure of time during online sessions for shared experiences that lead to understanding, reflection and peer support for arriving at agreement on how to go about a team assignment.

Intentional learning related to threaded discussion that achieves the learning outcomes based on content of the course, the readings and the assignments. The variables are explicit information upon which postings elaborate and augment, clarify and summarize the content. Beyond these postings, incidental learning is voluntarily generated by learners including shared experiences, observations, reflections, peer support and disagreements. A good facilitator will encourage and participate is this activity.

In discussing three online delivery modes, Schwartz (2006b) endorses the following: Combination or hybrid – in which *asynchronous* threaded discussions are used for discussion questions that call for more reflective responses; *synchronous* voice/visual sessions are used for the instructor's visually-aided lectures interspersed by student questions, instructor questions to students, live classroom discussion, breakout group problem-solving and the like (p.3). Schwartz (2006a) discusses an approach in which a "wide variety of learning activities that would not otherwise be possible in a purely asynchronous environment" (p.1). See Figure 7 for a generalized layout of the synchronized VLE.

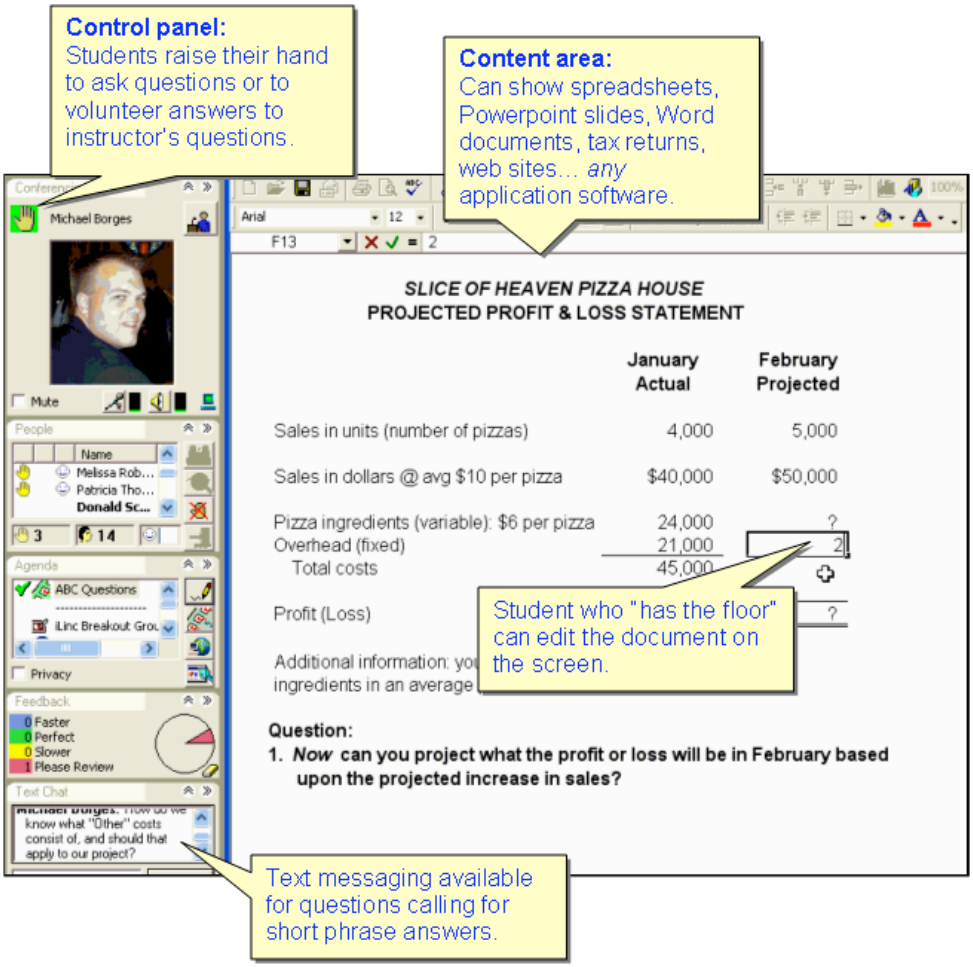


Figure 7. Live Voice / Visual Learning Environment (Schwartz, 2006a, p. 2)

Author's Experience

Practitioners who facilitate online courses like to be confident that course content is relevant and can be demonstrated by their real-world experiences. Prepared courseware may reflect a grounded approach to the systematic use and interaction between pedagogical models, strategies, learning and instructional theories. Program directors like reassurance that the academic theories are meaningful when transferred into the real world. Beyond course preparation, the online delivery of interactive synchronized lectures ensures relevance to the ambitions of the learners, not just to pass a course but to actually gain useful knowledge. These ambitions first need to be understood by the facilitator. Then, time during online sessions can be allocated to fully experience collaboration on assignments. Learners come from a diverse background and eagerness to take on new skills. The shared experience starts with getting to know the students' background and intentions to gain skills in the current course for working jointly with a small group to perform collaborative work.

It is this author's direct experience with eCollege, WebCT, Outlook Express and Blackboard that familiarly with one LMS can quickly be translated to another tool. If the facilitator polls the learners for any need to be coached in the features of a LMS, then it can be demonstrated live during class when clear instructions are provided to explain where to find things, where to drop assignments and when to participate actively in threaded discussions and when metrics will be captured for scoring work. There was a clear benefit to using synchronized lessons such as Elluminate to demonstrate use of the LMS environment. A reasonable substitution is prepared tutorial presentations.

Direct hands-on experience delivering online lectures in a synchronized learning environment has been summarized. The prepared story-board walk-thru shows images of a LMS environment called eCollege and ClassLifePro for live lectures and synchronized chat for assignments to be performed joined by teams.

Conclusion

This paper has shared two case studies about online learners who gained virtual team skills for course assignments that set expectation that the process of becoming a virtual team is as important as the deliverable that is created through collaboration. It features ideas on how universities can prepare learners for industry expectations through existing programs by allowing virtual team assignments to reflect real world best practices.

Given the diversity of opinions, the answer remains open to questions about today's students becoming information literate using traditional academic sources or by skills in using search engines and electronic journals. There is evidence that online students prefer taking a path of least resistance for performing the assignments. Some learners prefer solo execution of coursework out of a perception that communicating with a team mate is too distracting and may be extra effort. Successful team work building the skill of

communciations that transfer to real world projects opens these students to the advantage of joint assignments.

In a final journal report, a learner in the first case study remarked on the nature of virtual teams. “Thinking about this concept, I do find it interesting how a system can totally overhaul your business and its processes. This shows how tightly these business and systems can be wrapped together and can make or break a business. I also feel like an organization should not just trust anyone to implement these systems. You would want to make sure that you had a highly experienced and proven team implementing this system. After all, it is your business you are putting on the line (Woodward, 2008).

Awareness of the complexities of the enabling high performance technologies needs to include a critical analysis of how information can be used effectively. This learning outcome is more that rhetorical awareness. The opportunity for online high tech courses is to go beyond traditional practices of teacher-oriented delivery is being acknowledged.

Performing activities to produce a deliverable is not just about responding to the instructor’s insturctions and submitting a jointly writen paper or an exam. The lesson to be applied is to consciously influence methods of collaboration that enhances business outcomes. Working in virtual teams increases the value of the lesson and the result created.

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