

Exploring How Experienced Online Instructors Report Using Integrative Technologies to Support Self-Regulated Learning

Nada Dabbagh
Anastasia Kitsantas
George Mason University

The purpose of this exploratory study was to examine college instructors' self-reported use of integrative learning technologies (ILT) to support student self-regulated learning (SRL) in online or blended learning environments. Participants were 12 experienced online instructors in a large mid-Atlantic university. Participants responded to a questionnaire regarding their use of ILT to support SRL processes such as goal setting, self monitoring, self evaluation, and time planning. Results revealed that specific categories of ILT were used to support specific SRL processes confirming previous research results. Results also revealed that these instructors were not deliberately using ILT to support student SRL. The educational implications of these results are discussed as well as directions for future research.

Keywords: instructional technology, learning management systems, self-regulated learning, online learning, blended learning

INTRODUCTION

Research generally concludes that technology-enriched learning designed to enhance student self-regulation and motivation in a particular subject facilitates academic performance and contributes to student positive attitudes toward learning (Henry, 1995; Kramarski & Gutman, 2006; Lopez-Morteo & Lopez, 2007). Self-regulation or self-regulated learning (SRL) in particular refers to an individual's ability to acquire knowledge and skill without reliance on others (e.g., teachers, parents). In other words, a self-regulated individual is an active participant in his or her own learning process in terms of metacognition, motivation, and behavior (Zimmerman, 1989). Being or becoming a self-regulated individual is particularly critical in a "just-in-time, needs-driven world" where students need a broad base of understanding across a wide variety of

subjects and skills and “a proven track record of learning how to learn” (Johnson, 2003a, p. 11).

In traditional face-to-face teaching settings faculty can gather information about their students’ SRL skills through face-to-face interactions and observation and can teach students effective SRL strategies through a variety of well established instructional methods (Dabbagh & Kitsantas, 2004). However, in blended or online learning environments, it becomes more difficult for faculty to assess students’ learning behaviors, and for students to discern the instructor’s expectations (Johnson, 2003b). Additionally, the physical absence of the instructor in online learning environments coupled with the increased responsibility demanded of students to achieve learning tasks on their own presents additional difficulties for students, particularly those with low self-regulatory skills (Kauffman, 2002).

Research results of earlier studies (e.g., Bernt & Bugbee, 1993; Biner, Bink, Huffman & Dean, 1995; Pugliese, 1994) that examined psychological and academic barriers to persistence in distance education revealed that overall, intrinsically motivated learners possessing a high internal locus of control, a positive attitude toward the instructor, and a high expectation for grades and degree completion were more likely to succeed in a distance education course. Additionally, Dabbagh (2007) posited that successful online learners must not only be skilled in the use of learning technologies but must also have a strong academic self-concept and acquire self-directed learning skills through the deployment of time management and cognitive learning strategies. Consequently, the need to promote student self-regulation using learning technologies in online and blended learning environments is paramount. Therefore, the purpose of this study was to examine college instructors’ self-reported use of learning technologies, specifically integrative learning technologies (ILT), to support student SRL in online or blended learning environments.

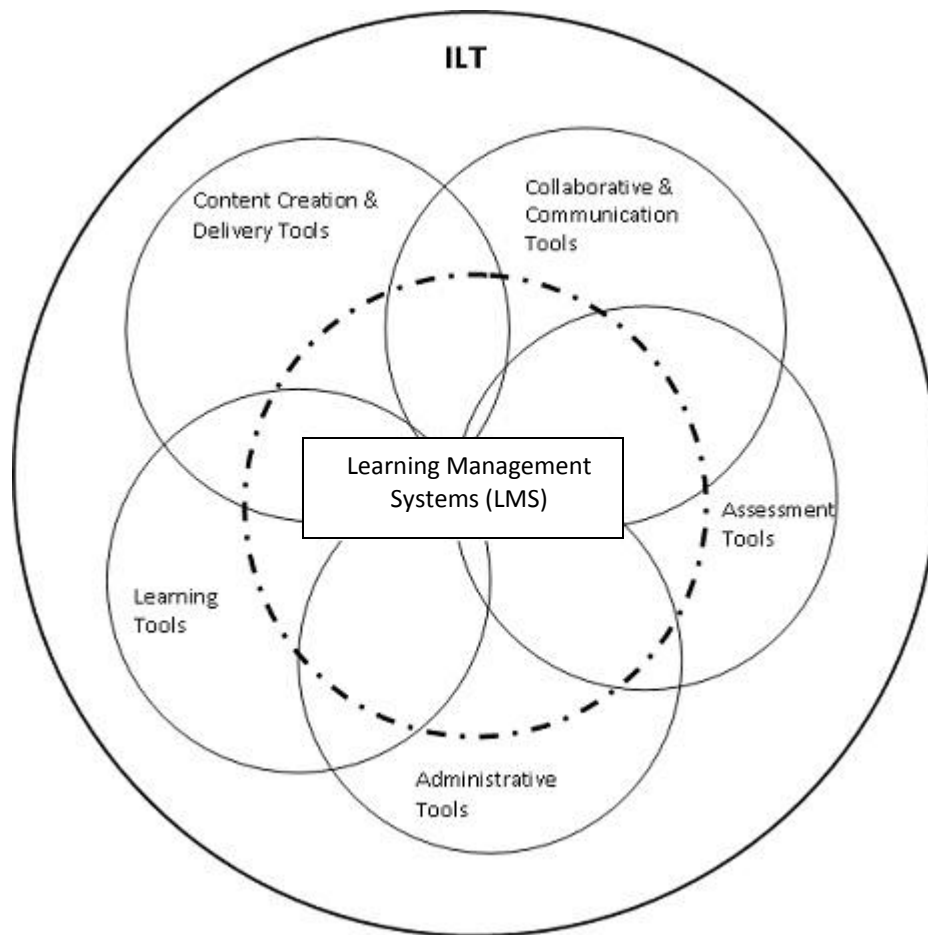
INTEGRATIVE LEARNING TECHNOLOGIES

ILT is defined as a dynamic collection or aggregation of Web tools, software applications, and mobile devices that integrate technological and pedagogical features and affordances of the Internet and the Web to facilitate the design, development, delivery, and management of online and blended learning (Dabbagh & Bannan-Ritland, 2005; Kitsantas & Dabbagh, 2010). This definition is broad enough to encompass traditional technologies (e.g., course or learning management systems (CMS/LMS)) as well as emerging technologies (e.g., Web 2.0 tools and social media). More specifically, ILT can be classified into five broad pedagogical categories which include collaborative and communication tools, content creation and delivery tools, administrative tools, learning tools, and assessment tools.

Collaborative and communication tools include asynchronous and synchronous communication tools (e.g., email, discussion forums, chat), social networking tools (e.g., Facebook, LinkedIn), and group process tools (e.g., GoogleDocs). Content creation and delivery tools include tools for instructors to create, deliver, and manage web-based content (e.g., CMS/LMS syllabus and document features), and tools for students to contribute resources and submit assignments (e.g., CMS/LMS assignment feature). Administrative tools include tools to manage student information such as importing the class roster from the institution’s registration system and generating a student e-mail list, and tools to manage course content and activities such as creating a course calendar, planning and releasing assignments, and generating student work areas and discussion forums. Learning tools include tools primarily for learners such as content collection or aggregation tools (e.g., social media tools such as Delicious), exploratory tools (e.g.,

search engines), and personalized tools (e.g., note-taking and annotation tools). Finally assessment tools include tools ranging from the creation of traditional tests to the development of more authentic performance-based assessments such as e-portfolios. Figure 1 depicts the relationship between ILT, LMS, and these five pedagogical categories. More specifically, Figure 1 illustrates that CMS or LMS such as Blackboard, Moodle, or eCollege are considered a subset of ILT and that LMS integrate tools from the five broad and intersecting pedagogical categories. Figure 1 also illustrates that these categories extend beyond LMS to encompass more current and emerging technologies (e.g., Web 2.0 tools and social media).

Figure 1. Relationship among ILT, LMS, and pedagogical tools categories.



ILT enable instructors to extend the benefits of an effective classroom environment beyond the physical campus setting and increase the level of activity, engagement, and contact between instructors and students (Maslowski, Visscher, Collis, & Bloemen, 2000). For example, using ILT, instructors can create opportunities for learners to interact with experts from around the world, provide learners with instantaneous access to global resources, allow learners the unprecedented opportunity to publish to a world audience, make virtual field trips a reality, enable communication with a diverse audience, and provide learners with the opportunity to share and compare information, negotiate meaning, and co-construct knowledge (Dabbagh & Bannan-Ritland, 2005). More specifically, LMS, also known as an “enterprise technology” (Carmean & Brown, 2005),

integrate several technological and pedagogical features that promote active and collaborative learning. Examples of such features include Web browsing, asynchronous and synchronous communication, personalized learning tools, experience and resource sharing tools, lesson and content generation tools, and administrative tools that allow tracking of student progress and course data. These features can be used by faculty to support and promote student use of self-regulatory processes such as goal setting, task strategies, help seeking, self-monitoring, self-evaluation, and time planning and management (Dabbagh & Kitsantas, 2005; Kitsantas & Dabbagh, 2004).

Increasingly, LMS are integrating the newer Web 2.0 and social software tools (e.g., weblogs and wikis) and more authentic assessment features (e.g., peer review capabilities, electronic portfolios, and grading rubrics) providing faculty with an even wider and more flexible array of tools to design effective and engaging learning activities. However, research has shown that college instructors who adopt an LMS to facilitate online and blended learning are using very few of its features or primarily using LMS features for information dissemination rather than in ways that engage students in meaningful and strategic or self-regulated learning (Apedoe, 2005; Boettcher, 2003; Dabbagh, 2005; Oliver, 2001). Additionally, the continual emergence of newer learning technologies is consistently challenging the way we teach and learn and redefining our learning spaces, interactions, and perspectives. For one, the traditional concept of the “residential, full-time student” is fading and students are demanding more engaging learning experiences and instant access to information due to work and life demands (The Horizon Report, 2007). Johnson (2003b) posited that the one size fits all industrial model of education is rapidly being replaced by a “service-economy model where learning is tailored to the learner” (p. 29).

More importantly, today’s students use technology very differently than faculty. For example, students are increasingly generating their own content using publishing tools such as weblogs (blogs) and wikis, and are establishing personal reputations, exchanging resources, and collaborating through social and professional networking utilities such as MySpace, Facebook, and LinkedIn (Alexander, 2006). These social networking tools, which constitute a subset of ILT, are supporting what Wenger, McDermott and Snyder (2002) describe as organic and voluntary communities of practice because they are generating “enough excitement, relevance, and value to attract and engage members” (p. 50). Hence, if faculty wish to gain students’ attention, enable strategic learning, and sustain student motivation to learn, they must not only keep up with new technologies, but also learn how to deliberately use them to support student self-regulated learning or SRL.

Research has shown that ILT have powerful potential as teaching tools for instructors and learning tools for students. A review of the literature shows that when ILT were used as metacognitive tools with students, they not only contributed to student achievement but they also helped students develop specific study skills and SRL processes such as goal setting, self-monitoring, and self-evaluation (Chang, 2007; Perry & Winne, 2006; Winne, 2006; Winne et al., 2006). Additionally, research has shown that different categories of ILT supported different self-regulation processes (Dabbagh & Kitsantas, 2005; Kitsantas & Dabbagh, 2004). Specifically, Kitsantas and Dabbagh (2004) and Dabbagh and Kitsantas (2005) conducted two studies involving 80 and 65 college students respectively. These students were enrolled in a total of eight LMS-supported undergraduate and graduate courses. In both studies, students were asked to indicate which self-regulatory processes (e.g., goal setting, self-monitoring, time planning and management) were supported or promoted through the use of LMS features based on the five pedagogical ILT categories described earlier. The results of the first study (Kitsantas & Dabbagh, 2004) revealed that (a) administrative tools (e.g., course planning and

scheduling tools such as the online calendar) supported the use of self-monitoring and help seeking; (b) collaborative and communication tools (e.g., e-mail, discussion forums, and document sharing and file exchange tools) were more useful in supporting goal setting, help seeking, and time management; (c) content creation and delivery tools (i.e., resource sharing and Web publishing tools) were reported as particularly helpful for self-evaluation, task strategies, and goal setting; and (d) learning tools (e.g., bookmarking tools, search tools, and help tools) were reported as more useful in supporting task strategies. Furthermore, the results of the second study (Dabbagh & Kitsantas, 2005) revealed that assessment tools (e.g., student portfolios and online gradebook) supported task strategies, self-monitoring, and self-evaluation.

Additionally, in the Dabbagh and Kitsantas (2005) study, qualitative results complemented the quantitative results revealing the usefulness of ILT features in supporting self-regulation while completing specific course assignments. For example, students perceived content creation and delivery tools useful in scaffolding the SRL processes of help seeking, task strategies, self-evaluation, and goal setting while completing assignments involving problem-solving tasks. Students also perceived collaborative and communication tools useful in supporting help seeking and time management while completing collaborative or team-based assignments. These results have significant implications on using ILT to support student self-regulation. Knowing which self-regulatory processes are supported using ILT categories can assist instructors in providing the scaffolding needed to promote student self-regulation in online and blended learning contexts as well as target and improve specific student self-regulatory skills. Therefore, in order to better understand the pedagogical potential of ILT and consequently demonstrate to faculty and college instructors how to use ILT to design engaging learning activities that can enhance student self-regulation, this study sought to examine how experienced online instructors are using ILT to support student SRL in online and blended courses. It was expected that specific ILT categories would be used to support specific SRL processes. It was also expected that these instructors were not deliberately using ILT to facilitate student SRL.

METHOD

PARTICIPANTS

Participants were 12 (6 female, 6 male) experienced online instructors and technology users in a large mid-Atlantic university. Participants had 5-10 years experience in using ILT to support teaching and learning. Each participant had participated at least once as an invited guest speaker, presenter, and/or workshop facilitator at instructional technology faculty development workshops organized by the university's Instructional Resource Center (IRC) and Center for Teaching Excellence (CTE). Each participant had been using an LMS (WebCT or Blackboard) for at least 3 years to facilitate online or blended course delivery and had participated in the pilot testing of at least one LMS installation or new version testing. Participants represented faculty from the following disciplines: operations management, information technology, conversation studies, mathematics education, management and organizational behavior, educational leadership, and communication.

MEASURES

The questionnaire used to collect data in this study, Evaluating the Instructional Utility of ILT (see Appendix), was developed based on Zimmerman's (1989) research on

self-regulation which identified six processes of self-regulation: goal setting, task strategies, time planning, self-monitoring, self-evaluation, and help seeking. The questionnaire originally consisted of 34 short answer items but was condensed to 22 short answer items after pilot testing with a sample of experience online instructors. Some of the original items were also reworded according to the feedback received from the pilot test. The remaining 22 questions queried faculty about their use of ILT or LMS tools to support the six SRL processes. Example items included, “As an instructor what ILT or LMS tools do you use to help your students keep track of their progress on assignments? (Provide a specific example)” and “As an instructor what ILT or LMS tools do you use to help your students set specific goals for what they need to achieve for each course assignment? (Provide a specific example)”. The questionnaire also included items that addressed demographics.

PROCEDURE

The experienced instructors were recruited through the university’s Instructional Resource Center (IRC) and the Center for Teaching Excellence (CTE). The researchers asked IRC and CTE to provide them with a list of faculty who are experienced online instructors and instructional technology users. A list of 22 such instructors was provided. The researchers emailed those instructors and asked them to participate in this study. The email explained the purpose of the study, defined ILT, and included a URL that contained the informed consent form and the web based questionnaire. The response rate was 55% (12 instructors completed the questionnaire). The instructions on the main questionnaire page stated the following:

There are 22 questions in this questionnaire in addition to a few general questions at the beginning. For each of the 22 questions please provide a few sentences that describe how you use ILT or LMS features to design and facilitate instruction in your courses. Please provide as many examples as possible to illustrate your points. If a question is not applicable, please enter NOT APPLICABLE in the text box. The survey should take about 35 minutes to complete.

RESULTS

The data from all participants were aggregated by the SRL processes depicted in the questionnaire and were analyzed using a conceptually clustered matrix (Miles & Huberman, 1994). The rows in the matrix consisted of the six SRL processes and the columns consisted of the five pedagogical ILT categories defined earlier (see Table 1). The data were coded according to the cells of the matrix. The inter rater agreement was 91%. Short quotes and summarizing phrases were used as examples to describe how the participants reported they used ILT to support each SRL process. Additionally, frequency analyses were performed to determine the number of times an instructor reported using a specific ILT tool or category to support an SRL process and the number of Not Applicable (NA) occurrences for each question.

As expected, the results revealed that overall; instructors said they used specific ILT categories to support specific SRL processes. For example, 25% of participants said they used checklists (ILT content creation and delivery tools) to support student goal setting, and 84% of participants said they used the LMS syllabus tool (ILT content creation and delivery tool) and the LMS calendar feature (ILT administrative tool) to support time planning (see Table 2). Task strategies (an SRL process that includes the ability to summarize, relate, organize, and review content) was primarily supported using two ILT categories, content creation and delivery tools and collaborative and communication

tools. Specifically, 13% of participants reported using narrated PPT slides (a content creation and delivery tool) to help students access the learning content both visually and orally, 17% of participants created study guides and self-test quizzes using the LMS document and assignment tools, and 25% used threaded discussions and wikis (collaborative and communication tools (see Table 3).

Table 1. Data Analysis Matrix

SRL Processes/ILT Categories	Collaborative and Communication Tools	Content Creation and Delivery Tools	Learning Tools	Administrative Tools	Assessment Tools
Goal Setting					
Task Strategies					
Time Planning					
Self-					
Monitoring					
Self-					
Evaluation					
Help Seeking					

Table 2. Supporting Goal Setting and Time Planning Using ILT

SRL Process	ILT/LMS Category/Tool	Participant Use (%)	Example
Goal Setting (Q1) (mastery oriented goals)	Content Creation & Delivery Tools (e.g., creating and uploading a syllabus, checklist, or rubric)	25%	I use checklists for every module where students identify a learning schedule and set specific dates for completion of each assignment as well as beginning and completion of each module.
		17% (other) 58% (NA)	
Time Planning (Q2)	Content Creation & Delivery Tools; Administrative Tools (e.g., LMS syllabus & calendar tools)	84%	The syllabus contains a table of weeks and activities. The CMS (Moodle) also assigns dates to the activities and assignments, so the students can look up the dates in Moodle's internal calendar system.
		8% (other) 8% (NA)	

Table 3. Supporting Task Strategies Using ILT

SRL Process	ILT/LMS Category/Tool	Participant Use (%)	Example
Task Strategies (Q3-Q11) (summarizing, relating, organizing, reviewing, collaborating)	Content Creation & Delivery Tools; Collaborative & Communication Tools		
	(e.g., creating and posting content in several multimedia formats)	13%	Posting of PPT slides helps students to get the material both visually and orally . They can manipulate the slide show (e.g., by taking notes in the notes section) any way they like to suit their learning styles.
	(e.g., LMS Document Tool, Assignment Tool, & Resources Tool)		
	(e.g., threaded discussions, Google Groups, wikis)	17%	I post study guides and self-test quizzes to WebCT.
		25%	I have had a discussion board assignment where I asked MBA students to reflect on the topic of the week and provide examples from their own work experience. In this instance they shared their input with the whole class on-line.
		12% (other) 33% (NA)	

The SRL process of self-monitoring (the ability of a student to keep track of his/her learning progress) was primarily supported through two ILT categories, content creation and delivery tools and administrative tools and the SRL process of self-evaluation (self-reflective practice) was primarily supported using two ILT categories, content creation and delivery tools and collaborative and communication tools (see Table 4). Last but not least, the SRL process of help seeking was primarily supported using the ILT categories of content creation and delivery tools and collaborative and communication tools (see Table 5). None of the participants used ILT learning tools or assessment tools to support student SRL.

Table 4. Supporting Self-Monitoring and Self-Evaluation Using ILT

SRL Process	ILT/LMS Category/Tool	Participant Use (%)	Example
Self-Monitoring (Q12-Q14)	Content Creation & Delivery Tools; Administrative Tools (Assignment Tool)	25%	I use the WebCT assignment tool . For some

(keep track of progress; staying up to date on class assignments)	(Gradebook)	33%	assignments, I divide assignments into two parts, a draft and a revised version.
	(Calendar)	17% 11% (other) 14% (NA)	My Grades function. Anytime a piece of work is graded it is posted almost immediately so they know where they stand at all times in the course.
Self-Evaluation (Q15-Q18)	Content Creation & Delivery Tools; Collaborative & Communication Tools		
(self-reflective practice)	(LMS Document Tool, Assignment Tool)	20%	I provide a detailed checklist of what is expected.
	(Email, wiki)	8% 11% (other) 61% (NA)	Embedded questions in online lecture (e.g., PPT) gives immediate feedback and lets them go back to review material they missed. I use individual emails to give feedback on assignments.

Table 5. Supporting Help Seeking Using ILT

SRL Process	ILT/LMS Category/Tool	Participant Use (%)	Example
Help-Seeking (Q19-Q22)	Content Creation & Delivery Tools; Collaborative & Communication Tools		
(access and location of resources; asking questions)	(LMS web links, resources Tool)	19%	There is a links section that provides suggested reading and/or help for concepts.
	(Documents Tool Syllabus Tool)	27%	I put the syllabus as a link on top of the course's main page;

Organizer Tool Assignment Tool)		has links to the calendar, assignments, course materials, etc.
(Email, discussion Boards, wikis)	27%	The WebCT discussion board allows students to ask me, or other students, questions about assignments or concepts.
	4% (other)	
	23% (NA)	

The results also revealed that 61% of participants did not report using ILT to support the SRL process of self-evaluation and 58% of participants said they did not use ILT to support goal setting, a critical process of SRL. For the remaining SRL processes examined in this study, 33% of participants said they did not use ILT to support task strategies, 23% said they did not use ILT to support help seeking, 14% said they did not use ILT to support self-monitoring, and 8% said they did not use ILT to support time planning. Additionally, the results revealed that participants reported they used “other” tools (e.g., TaskStream, an outcome based assessment system) to support SRL, or, did not specify a technology.

DISCUSSION

The findings of this study have significant implications on using ILT to support or promote student SRL. Similar to the findings of previous research that focused on students’ use of ILT (Kitsantas & Dabbagh, 2004; Dabbagh & Kitsantas, 2005), this study which focused on experienced online instructors reported use of ILT, has also shown that different ILT categories support different SRL processes. This is an important finding that emphasizes that knowledge of which self-regulatory processes can be supported using ILT categories can assist college instructors in providing the scaffolding needed to promote student SRL in online and blended learning contexts in order to ensure academic success. However the results of this study also revealed that these experienced instructors did not report deliberately using ILT to support student SRL. This may be largely due to the fact that technology diffusion and adoption continues to face several barriers in higher education contexts.

Blin and Munro (2008) discuss that since the emergence of the Internet and e-learning, education researchers have been anticipating a large scale transformation to the traditional approach to teaching. However, change has been slow and college instructors seem to show a sense of resistance to adopting technology in their teaching methods. When this pattern was further examined, Blin and Munro (2008) found that the main reason why college instructors did not integrate technology into their teaching practice was because of their lack of knowledge of the newer technologies and motivation to change their traditional teaching practices. Additionally, research has shown that although college instructors acknowledge the teaching potential of technology particularly as this relates to promoting student interest in learning and actively engaging students in their learning, these instructors generally do not integrate sophisticated technologies into their teaching practice (Brill & Galloway, 2007). Despite these barriers, research shows that the use of technology allows students to learn more independently and autonomously, which is a critical skill to develop in college (Bowers-Campbell, 2008). Furthermore, research shows that the use of social networking tools in teaching and learning contexts can help instill interest and motivate students to learn the subject

matter as well as develop critical self-regulatory skills to be successful in college (Bowers-Campbell, 2008).

Overall, ILT as a means of gathering, processing, and communicating information can be very powerful tools for helping students take responsibility of their own learning but knowing how to deliberately use them to teach students to become proactive and strategic learners takes training and practice. The findings of this study suggest that many instructors lack comprehensive knowledge on, a) how to use ILT, and b) the potential that ILT has to support student self-regulation, motivation, and learning. For example, 61% of this sample of experienced online instructors said they did not use ILT to support the SRL process of self-evaluation, and 58% said they did not use ILT to support goal setting, a critical process of SRL. These are important findings because effective goal setting can enhance academic performance in several ways. In fact, goal setting can help students determine the amount of effort to expend on a specific learning task and can help dictate direction, focus, and persistence in a task (Kitsantas & Dabbagh, 2010) whereas self-evaluation prompts reflection upon one's performance outcomes and aspects of the learning process (Kitsantas & Zimmerman, 2006). In addition, research has shown that self evaluation is more effective for self-efficacy and self-regulation when learning goals are also present (Schunk & Ertmer, 1999). These SRL processes can greatly impact students' successful engagement in the types of learning tasks required in online and blended courses (Hartley & Bendixen, 2001). Clearly, teaching instructors to take advantage of ILT to help students engage in goal setting and self-evaluation can enhance student motivation and learning.

Furthermore, given the inevitable gravitation of students towards Web 2.0 technologies and social media in particular, more research is needed to inform instructors how to use these emerging technologies to support and promote student self-regulation. The findings of this study can guide the development of instructor training workshops that focus on the use of ILT to support SRL in online and blended courses with an emphasis on how technology can be used to enhance processes of self-regulated learning such as goal setting and self-evaluation. The findings of this study also open the door for more research in this area. Most of the research studies on the instructional utility of ILT have focused on student outcomes. Shifting our attention to instructors may yield important findings on how to design instruction using ILT to promote and support student SRL. Limitations of this study include the small sample size and the self-report nature of the study. Perhaps a face-to-face interview with the instructors may have yielded better results given that some of them did not have much training in pedagogy. More research is needed to replicate these findings and address these issues further.

REFERENCES

- Alexander, B. (2006). Web 2.0: A new wave of innovation for teaching and learning? *EDUCAUSE Review*, 41(2), 32–44. Retrieved June 13, 2006, from <http://www.educause.edu/ir/library/pdf/ERM0621.pdf>
- Apedoe, X.S. (2005). The interplay of teaching conceptions and course management system design: Research implications and creative innovations for future designs. In P. McGee & C. Carmean, & A. Jafari (Ed.), *Course management systems for learning: beyond accidental pedagogy* (pp. 57-68). Hershey, PA: Information Science Publishing.
- Bernt, F.L., & Bugbee, A.C. (1993). Study practices and attitudes related to academic success in a distance learning programme. *Distance Education*, 14(1), 97-112.
- Biner, P.M., Bink, M.L., Huffman, M.L., & Dean, R.S. (1995). Personality characteristics differentiating and predicting the achievement of televised-course students and

- traditional-course students. *The American Journal of Distance Education*, 9(2), 46-60.
- Blin, F., & Munro, M. (2008). Why hasn't technology disrupted academics' teaching practices? Understanding resistance to change through the lens of activity theory. *Computers & Education*, 50(1), 475-490.
- Boettcher, J. V. 2003. The dangers and pitfalls of communicating with students or what not to do when communicating with students on the Internet. Retrieved July 6, 2009 from <http://www.designingforlearning.info/services/writing/comm.htm>
- Brill, J. M., & Galloway, C. (2007). Perils and promises: University instructors' integration of technology in classroom-based practices. *British Journal of Educational Technology*, 38(1), 95-105.
- Bowers-Campbell, J. (2008). Cyber "Pokes": Motivational antidote for developmental college readers. *Journal of College Reading and Learning*, 39(1), 74-87.
- Carmean, C., & Brown, G. (2005). Measure for measure: Assessing course management systems. In McGee, P., Carmean, C., Jafari, A. *Course management systems for learning: Beyond accidental pedagogy*. Hershey, PA: Information Science Publishing.
- Chang, M. (2007). Enhancing web-based language learning through self-monitoring. *Journal of Computer Assisted Learning*, 23(3), 187-196.
- Dabbagh, N. (2007). The online learner: Characteristics and pedagogical implications. *Contemporary Issues in Technology and Teacher Education (CITE)*, 7(3). Available online at: <http://www.citejournal.org/vol7/iss3/>
- Dabbagh, N. (2005). Pedagogical models for e-Learning: A theory-based design framework. *International Journal of Technology in Teaching and Learning*, 1(1), 25-44.
- Dabbagh, N., & Bannan-Ritland, B. (2005). *Online learning: Concepts, strategies, and application*. Columbus, OH: Prentice Hall.
- Dabbagh, N., & Kitsantas, A. (2005). Using web-based pedagogical tools as scaffolds for self-regulated learning. *Instructional Science*, 33(5-6), 513-540.
- EDUCAUSE Learning Initiative & The New Media Consortium. (2007). The Horizon Report 2007 Edition. Available at: <http://www.nmc.org/horizon/2007/report>
- Hartley, K., & Bendixen, L. D. (2001). Educational research in the Internet age: Examining the role of individual characteristics. *Educational Researcher*, 30(9), 22-26.
- Henry, M. J. (1995). Remedial math students' navigation patterns through hypermedia software. *Computers in Human Behavior*, 11(3-4), 481-493.
- Johnson, D.E. (2003a). Toward a philosophy of online education. In David G. Brown (Ed.), *Developing faculty to use technology: Programs and strategies to enhance teaching* (pp. 9-11). Bolton, MA: Wiley Publications.
- Johnson, D.E. (2003b). The ethics of teaching in an online environment. In David G. Brown (Ed.), *Developing faculty to use technology: Programs and strategies to enhance teaching* (pp. 27-31). Bolton, MA: Wiley Publications.
- Kauffman, D.F. (2002). Self-regulated learning in Web-based environments: Instructional tools designed to facilitate cognitive strategy use, metacognitive processing, and motivational beliefs. A paper presented at the American Educational Research Association, New Orleans, LA.
- Kitsantas, A., & Dabbagh, N. (2004). Promoting self-regulation in distributed learning environments with web-based pedagogical tools: An exploratory study. *Journal on Excellence in College Teaching, special issue, Web-based Teaching and Learning*, 15 (1-2), 119-142.

- Kitsantas, A., & Dabbagh, N. (2010). *Learning to learn with Integrative Learning Technologies (ILT): A practical guide for academic success*. Greenwich, Connecticut: Information Age Publishing.
- Kitsantas, A., & Zimmerman, B. J. (2006). Enhancing self-regulation of practice: The influence of graphing and self-evaluative standards. *Metacognition and Learning, 3*(1), 201–212.
- Kramarski, B., & Gutman, M. (2006). How can self-regulated learning be supported in mathematical E-learning environments? *Journal of Computer Assisted Learning, 22*(1), 24-33.
- Lopez-Morteo, G., & López, G. (2007). Computer support for learning mathematics: A learning environment based on recreational learning objects. *Computers & Education, 48*(4), 618-641.
- Maslowski, R., Visscher, A.J., Collis, B., & Bloemen, P.P.M. (2000). The formative evaluation of a web-based course-management system within a university setting. *Educational Technology, 40*(3), 5-19.
- Miles, M.B., & Huberman, M.A. (1994). *Qualitative data analysis* (2nd edition). Thousand Oaks, CA: Sage Publications.
- Oliver, R. (2001). Seeking best practice in online learning: Flexible learning toolboxes in the Australian VET sector. *Australian Journal of Educational Technology, 17*(2), 204-222.
- Perry, A, and Winne, P. (2006) Learning from learning kits: gStudy traces of students' self-regulated engagements with computerized content. *Educational Psychology Review, 18*(3), 211-228.
- Pugliese, R.R. (1994). Telecourse persistence and psychological variables. *The American Journal of Distance Education, 8*(3), 22-39.
- Schunk, D. H., & Ertmer, P. A. (1999). Self-regulatory processes during computer skill acquisition: Goals and self-evaluative influences. *Journal of Educational Psychology, 91*(2), 251-260.
- Wenger, E., McDermott, R., & Snyder, W.M. (2002). *A guide to managing knowledge: Cultivating communities of practice*. Boston, MA: Harvard Business School Press.
- Winne, P. H. (2006). How software technologies can improve research on learning and bolster school reform. *Educational Psychologist, 41*(1), 5–17.
- Winne, P. H., Nesbit, J. C., Kumar, V., Hadwin, A. F., Lajoie, S. P., Azevedo, R. A., & Perry, N. E. (2006). Supporting self-regulated learning with gStudy software: The learning kit project. *Technology, Instruction, Cognition and Learning, 3*(1), 105–113.
- Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339.

APPENDIX

EVALUATING THE INSTRUCTIONAL UTILITY OF ILT

In general, how do you use ILT or LMS tools or features to help students successfully complete your class requirements?

Goal Setting

Q1: As an instructor what ILT or LMS tools do you use to help students set specific goals (mastery oriented goals) for what they need to achieve for each course assignment? (Provide a specific example)

Time Planning

Q2: As an instructor what ILT or LMS tools do you use to help your students view a weekly schedule of the course? (Provide a specific example)

Task Strategies

Q3: As an instructor what ILT or LMS tools do you use to help your students summarize or paraphrase class reading assignments? (Provide a specific example)

Q4: As an instructor what ILT or LMS tools do you use to help your students relate what is being presented in class to things they already know? (Provide a specific example)

Q5: As an instructor what ILT or LMS tools do you use to help your students organize the instructional materials to suit the way they learn? (Provide a specific example)

Q6: As an instructor what ILT or LMS tools do you use to help your students review prior tests or assignments in order to study for exams or tests or complete assignments? (Provide a specific example)

Q7: As an instructor what ILT or LMS tools do you use to help your students work on an assignment with other classmates? (Provide a specific example)

Q8: As an instructor what ILT or LMS tools do you use to help your students learn by observing the work of other classmates? (Provide a specific example)

Q9: As an instructor what ILT or LMS tools do you use to help your students apply ideas from the lecture notes and readings to other class activities such as projects and assignments? (Provide a specific example)

Q10: As an instructor what ILT or LMS tools do you use to help your students pull together information from different sources, such as lectures, readings, and discussions? (Provide a specific example)

Q11: As an instructor what ILT or LMS tools do you use to explain difficult concepts your students? (Provide a specific example)

Self-Monitoring

Q12: As an instructor what ILT or LMS tools do you use to help your students keep track of their progress on assignments? (Provide a specific example)

Q13: As an instructor what ILT or LMS tools do you use to help your students check their grade on an assignment, quiz, or test? (Provide a specific example)

Q14: As an instructor what ILT or LMS tools do you use to help your students stay current or up-to-date on class assignments and due dates? (Provide a specific example)

Self-Evaluation

Q15: As an instructor what ILT or LMS tools do you use to help your students check over their work to make sure they did it right? (Provide a specific example)

Q16: As an instructor what ILT or LMS tools do you use to help your students judge how well they are doing in the course? (Provide a specific example)

Q17: As an instructor what ILT or LMS tools do you use to help your students stay apprised of the course's learning objectives? (Provide a specific example)

Q18: As an instructor what ILT or LMS tools do you use to help your students receive feedback on an assignment? (Provide a specific example)

Help Seeking

Q19: As an instructor what ILT or LMS tools do you use to help your students access course material? (Provide a specific example)

Q20: As an instructor what ILT or LMS tools do you use to help students locate information about the course requirements? (Provide a specific example)

Q21: As an instructor what ILT or LMS tools do you use to help your students ask the instructor and or classmates a question? (Provide a specific example)

Q22: As an instructor what ILT or LMS tools do you use to help your students find existing and additional resources on what is being taught in the course? (Provide a specific example)