

Accepted Manuscript

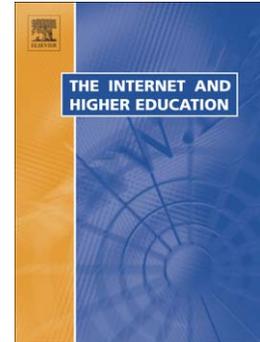
Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning

Sang Joon Lee, Sandhya Srinivasan, Trudian Trail, David Lewis, Samantha Lopez

PII: S1096-7516(11)00023-6
DOI: doi: [10.1016/j.iheduc.2011.04.001](https://doi.org/10.1016/j.iheduc.2011.04.001)
Reference: INTHIG 430

To appear in: *The Internet and Higher Education*

Accepted date: 6 April 2011



Please cite this article as: Lee, S.J., Srinivasan, S., Trail, T., Lewis, D. & Lopez, S., Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning, *The Internet and Higher Education* (2011), doi: [10.1016/j.iheduc.2011.04.001](https://doi.org/10.1016/j.iheduc.2011.04.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Running Head: STUDENT PERCEPTION OF SUPPORT

Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning

Sang Joon Lee^{*,a}, Sandhya Srinivasan^a, Trudian Trail^a, David Lewis^b and Samantha Lopez^a

^a Educational Technology and Assessment, University of South Florida, 13201 Bruce B. Downs Blvd MDC56, Tampa, FL 33612

^b Instructional Technology and Distance Education, Nova Southeastern University, 1750 NE 167th St Rm 449, Miami, FL 33162

* Corresponding author. Tel.: +1 813 974 3294; fax: +1 813 974 7761.
Email address: lsj0312@gmail.com

Sang Joon Lee is an Instructional/Multimedia Developer in the Office of Educational Technology and Assessment at the University of South Florida.

Sandhya Srinivasan is a Director of the Office of Educational Technology and Assessment at the University of South Florida.

Trudian Trail is an Instructional Designer in the Office of Educational Technology and Assessment at the University of South Florida.

David Lewis is a Program Professor of Instructional Technology and Distance Education at Nova Southeastern University.

Samantha Lopez is an Instructional Designer in the Office of Educational Technology and Assessment at the University of South Florida.

Abstract

Support for student learning is a key element in optimizing student learning experiences in any learning environment and its importance has been widely discussed. This study looked at student support, particularly in the course context, focusing mainly on guidance provided to students within a course. Three categories of support were identified and used for the purpose of this study: instructional, peer, and technical support. A total of 110 students completed an online survey on students' perceptions of support and course satisfaction in an undergraduate online course at a large southeastern university. The results showed perceived support was significantly related to their overall satisfaction of the online course. The findings of this study suggest that

teachers should communicate what types of support are available to students and provide an easy way of accessing and taking advantage of the support.

Keywords: Online Learning; Student Support; Student Satisfaction; Learning Outcome

ACCEPTED MANUSCRIPT

Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning

1. Introduction

Support for student learning is a key element in optimizing student learning experiences in any learning environment and its importance has been widely discussed. Student support, for example, has been closely related to student motivation and learning. Earwaker (1992) asserts that the aim of support for student learning is “to ensure that they derive maximum benefit from their course” (p. 11). Student support is needed to help students achieve learning goals and objectives successfully (Curley & Strage, 1996).

The quality of student support becomes the primary component to determine the effectiveness of a course (Küçük, Genç-Kumtepe, & Taşcı, 2010). Student support was once regarded as an add-on to pre-designed courses, but it has since been recognized that it should be considered and integrated into course design (Thorpe, 2002). Along with instructional support, teachers also need to provide technical and pedagogical assistance in technology-enhanced learning environments (Berge & Muilenburg, 2001). When preparing a course, faculty and instructional designers need to address how to support students in various ways. Creating learning environments where appropriate support for student learning is designed and provided becomes critical, particularly in online courses. In this paper, a framework of student support in online learning is proposed and the survey results from a study done to identify on the relationship among student perception of support, course satisfaction and learning outcomes are reported.

2. Framing Student Support

Teachers and instructional designers should provide a supportive learning environment (Moisey & Hughes, 2008). Student support becomes one of the critical components affecting a student’s success in any online learning environment (Rovai & Downey, 2010; Wheeler, 2006). Appropriate support strategies to meet students’ needs and learning styles are likely to enhance students’ learning and their learning experiences. Mullen and Tallent-Runnels (2006) suggest that instructors need to provide support to students while challenging them in order to increase their active engagement in learning. The provision of student support involves providing tutoring, counseling, and academic advising, and office hours to students.

Moore and Kearsley (2005) regarded student support as guidance and counseling services including orientations to online learning, administrative assistance, and social interaction with participants. Moore and others have described the theory of transactional distance (Moore, 1993; Saba, 2007; Saba & Shearer, 1994) which describes the pedagogical distance between a teacher and a learner through communication channels. The transactional distance depends mainly on dialog among participants and course structure. According to this theory, the number of students and class size impact dialog among participants. The course structure includes learning objectives, activities, and course contents. According to Saba, increasing dialog decreases transactional distance. Therefore student support should narrow the transactional distance

among participants by increasing dialog, to provide guidance, assistance, and enhance interaction in an online learning environment.

Thorpe (2002) recognized two contexts for learner support: the institutional context and the course context. In the institutional context, students need to have support regarding admission, registration, scholarship, research, and student life issues. Selim (2007) added library services, help desk, computer labs and facilities to the institutional support. In the course context, students look for clarification of course materials, assignments, activities, and assessments for the specific course. This study, in particular, looked at student support in the course context, focusing mainly on guidance and support provided to students within a course.

2.1. A Framework of Student Support

There are significant differences in students' perception of their online learning experiences (Mullenburg & Berge, 2005). Likewise, students may feel different towards student support that is designed to help them learn. It is assumed that the student perception of support is related to the transactional distance, which eventually influences their learning experiences. Indeed, students' perceptions of support are positively related to perceived learning, which includes student learning outcomes, student achievement and course satisfaction (Mullen & Tallent-Runnels, 2006). Therefore, learning environments should provide proper support as well as appropriate structure of course materials and activities, effective ways of communication in order to decrease the transactional distance and optimize student learning. Three categories of support were identified and used for the purpose of this study: instructional, peer, and technical support (see Figure 1).

Figure 1 about here

2.1.1. Instructional support

Instructional support refers to instructional guidance to learning, which involves answering students' questions, correcting their misunderstandings, providing clear instruction, relevant resources, and constructive feedback on their assignments and performance. Moreover, instructional support includes dialogs and course structures to motivate and encourage students to learn and master course materials and achieve learning objectives. Mullen and Tallent-Runnels (2006) recognized academic and affective support and found that both types of support were positively related to course satisfaction and perceived learning outcomes in online courses.

Instructional support comes primarily from the course instructor and teaching assistants, but technology can be used to provide the support to individual students and instructional contexts (Chen, Lambert, & Guidry, 2010). Scaffolding (Ge & Land, 2003), cognitive tutors (Koedinger & Corbett, 2006), apprenticeship (Collins, Brown, & Newman, 1989), and pedagogical agents (Baylor & Kim, 2005) are often used to support student learning. Scaffolding, for example, is a type of instructional support that can be characterized as indirect guidance and fading (van Merriënboer, Kirschner, & Kester, 2003). Scaffolding provides guidance toward the completion of a learning task, and this support is gradually faded until students can perform the task on their own. Question prompts have been frequently used as a scaffolding technique and reported that the prompt strategy facilitates student learning by

“directing students’ attention to important aspects of the problem, activating their schema, eliciting their explanations, and prompting them for self-monitoring and self-reflection” (Ge, Chen, & Davis, 2005, p. 220). Curley and Strage (1996) found that high instructional support, coupled with high instructional demands, are related to more sophisticated study strategies and higher level of performance.

2.1.2. Peer support

Peer support refers to peer-to-peer learning which involves students supporting each other on academic or non-academic issues. Encouraging social interaction and peer support plays an important role in learning environments. As collaborative works and social interaction become an important component of learning, students are more involved in helping other students and feel a sense of learning community. In online learning environments, in particular, peer support gets more important as online students may feel isolated easily due to a lack of social interaction among students (Muilenburg & Berge, 2005). In a factor analysis study, Muilenburg and Berge found that most students perceived the lack of social interaction as the most severe barrier and that improving interaction among students would make a course more effective and enjoyable.

Peer support occurs through learner-learner interaction, including group discussion, group projects, peer teaching, peer tutoring, and peer facilitation. Students can also support other students by answering questions, encouraging each other, and forming a study group for the course. In the study of Peer Support, Ashwin (2003) reported that a peer learning strategy was correlated to students’ academic performance. Goldschmid and Godschmid (1976) reviewed peer teaching models in higher education and asserted that the peer teaching strategy might benefit both student teacher and student learner. In addition, they found that the peer teaching model could develop interaction among students and collaboration skills, and thus facilitates active participation.

2.1.3. Technical support

Technical support includes providing assistance for any technical issues that students may face in the online and blended courses. Regardless of whether courses are online or blended courses, the use of technology has been increasing. Song, Singleton, Hill and Koh (2004) reported that the technical problem was the primary component to create challenges and to determine student satisfaction in online learning environments. Muilenburg and Berge (2005) reported that students who were comfortable using online learning technologies perceived significantly fewer barriers to online learning than those who were not familiar with the online technologies. Therefore, teachers and instructional designers need to make sure that students feel comfortable with online technologies and that any technical issues are addressed (Muilenburg & Berge, 2005; Song, et al., 2004).

3. Research Questions

It was assumed that student support would decrease the overall transactional distance of the course. Some students may perceive the same support differently than other students and this difference may serve to either facilitate or hinder their engagement in learning. Students’ perceptions of support may vary depending on many factors, including course formats, structures, communication tools, the number of students, teachers’ teaching styles, and students’

learning styles. Mullen and Tallent-Runnels (2006), for example, reported differences in students' perceived support and demands between online and traditional classes.

The purpose of this study was to examine the relationship between students' perceived support and their learning outcomes in an online course at a large southeastern university. This study addressed the following questions:

- a) Does students' perceived support influence their overall satisfaction of an undergraduate online course?
- b) Is students' perceived support related to their learning outcomes in the course?

4. Methods

An introductory undergraduate online course in public health at a large southeastern university was selected for this study during the spring semester in 2010. This online course provided narrated presentations and lecture notes through a course management system, *Blackboard 9*, without any face-to-face components. The learning activities in this course included online group discussions, papers, and quizzes.

4.1. Data Collection

The primary data was collected via a Web-based survey (see Table 1). The survey included 25 items on 5-point Likert scale (from 1-strongly disagree to 5-strongly agree) and 1 open-ended question (How could this course support your learning better?). The survey was available for a week before the final exam and students in the course were asked to participate in the Web-based survey on their perceptions of instructional, peer, and technical support as well as the course satisfaction. Of the 145 students in the course, a total of 110 students submitted responses to the online survey. The majority of the participants were female ($n = 81$), and 87 students aged between 16 and 22. Also, the researchers collected students' final scores to examine the relationship between their perceptions of support and learning outcomes.

Table 1 about here

4.2. Data Analysis

Descriptive statistics for each support category, course satisfaction, and final scores were calculated for the Likert-style format items. A correlation analysis was used to examine the relationship among the variables. Students' responses to the open-ended survey item were analyzed to discover any patterns and themes.

5. Results

Analysis of student survey data and final scores was completed by SPSS. The descriptive statistics for instructional, peer, and technical support, and course satisfaction are presented in Table 2. Overall, students felt that the course was supportive for their online learning. Students

rated the peer support ($M = 3.53$) lower than the other support categories since there were not many group activities in the course except two group discussions.

Table 2 about here

Table 3 presents the results of the bivariate correlation tests. The correlation analysis showed that students' perceived support was significantly related to their overall satisfaction of the online course. All instructional, peer, and technical support were positively associated with course satisfaction ($r = .659, .557, \& .541$, respectively, all $p < .01$). Although it was not a strong correlation, the results also showed that there was a correlation between course satisfaction and final scores ($r = .277, p = .004$). However, the results did not support that each category of students' perception of support was correlated with students' final scores.

Table 3 about here

Additionally, three major themes were developed from the students' responses to the open-ended survey item (How could this course support your learning better?): interaction, application, and self-directed learning. First, interaction was clearly related to students' perception of support in this course. Many students wanted to have more opportunities to interact with teachers. Providing a review session either online or face-to-face would be one way of increasing interaction between teachers and students. Also, an online or on-campus study group would facilitate interaction among students, which would help them support one another and decrease feelings of isolation in the course. Second, students felt supported when they were able to apply what they learned to other courses and real life. One student wrote, "It [the course] is supporting because some of the material I learned I am putting to use in my microbiology course." Students hoped to see more application of knowledge and skills to current events and practices. In order to apply what they have learned to current events and real practices, students wanted to have different types of course activities and assignments. Students felt that more relevant movies, narrated PowerPoint lectures, up-to-dated textbook, articles, discussions, and puzzles would help them understand the content better and increase learning transfer. One student suggested that providing opportunities and information about volunteering to promote and learn about public health within the community should help students relate course materials to current practices. Finally, some students felt that they learned better because the course intended to support self-directed learning. The course was set up to allow students to learn at their own pace so that students were able to work ahead. A few students mentioned that they would have learned more if they have been more active in studying and preparation. Thus, they felt that taking a responsibility for their own learning would play a critical role in this online course. For teachers and instructional designers, it becomes important to provide learner-centered learning environments and respond to students' needs and learning styles.

6. Discussion

This study examined the relationship between students' perceived support, course satisfaction, and their final scores. The results demonstrated that when students perceived that courses were supportive for their learning, they were more likely to be satisfied with the online course. The study also found that, although the perception of students' support was not directly associated with their final scores, the students' course satisfaction was related to their final scores. These results of the study support previous research regarding perceptions of support and course satisfaction (Lee, 2010; Mullen & Tallent-Runnels, 2006).

Having found that student perception of support does affect overall course satisfaction, the question that remains is how teachers and instructional designers can ensure that students feel supportive in their learning experiences. Building upon the platform laid down by previous research and the implications of the results of this study, several key elements can be identified as necessary for creating a learning environment that provides adequate support to the learner. This includes but is not limited to providing varied types of support and then providing adequate access to that support. Feedback and immediate communication also play a key role in ensuring that students feel supported in a course.

6.1. Varied Types of Support

When thinking of the type of support to include in an online environment, the type of learner should be taken into consideration. All learners are different, therefore, it is expected that the same type of support may not be suitable for all types of learner. Some learning experiences (online interaction and communication), may be better suited only for some students; consequently, it is crucial, especially in online learning environments, that suitable experiences be developed and selected for students to help promote learning (Küçük, et al., 2010). Having a variety of support available from which students can choose, allows the learner to have access to a learning experience that is tailored to his/her learning style, which may result in a more favorable course satisfaction.

6.2. Easy Access to Support

In addition to providing varied types of support for the varied type of learner, it is also imperative that students have easy access to the support that is available to them. Problems and issues will occur in any learning environment, and although minimizing the problems from the beginning is expected and desired, it is important for students to realize that they will be challenged and problems will occur (Song, et al., 2004). The real problem happens when students do not know what to do and how to utilize support when they have an issue. Consequently, instructors and instructional designers need to ensure from an early stage of the course that the learner is aware of the type of support available and exactly how to access it and use it. For example, in an online course, where technology plays a vital role in the overall learning environment, it is inevitable that students will encounter various technical issues. Planning ahead is a key. Tool overviews and other help documentation can be provided. This is not where it ends, however, as students need to be aware of how to locate and utilize these tools that are available. This is imperative not only for technical support, but also for peer and instructional support. Elements should be in place that explicitly informs the student of the support available to them and how it can be accessed. Also, in the event that the availability of

the provided support is compromised, tools need to be in place to supplement that compromised support.

6.3. Immediate Communication

Another important facet in ensuring students feel supported in a course is providing readily available and immediate communication between the instructor/facilitator and the learner. Teachers' immediate responses to students' questions and problems influence students' learning outcomes and satisfaction (Küçük, et al., 2010). These responses have been positively associated with teacher effectiveness (Baker, 2004). Baker found that instructors who were rated higher in instructor immediacy had the strongest potential for supporting students. More importantly, he also found that those students would be more likely to have a favorable impression of the course. While much of this research has been conducted in traditional classroom environments, Baker's study found this factor also applies to online courses.

It is critical for the instructor to provide means by which the learner feels that the instructor is readily available to them. This can be done by responding to emails and discussion boards in a timely fashion and by also providing daily reminders and periodic announcements and updates related to the course and learning objectives. Baker (2004) suggests that instructors can also integrate technological tools such as instant messaging and virtual meeting software, to help foster immediate communication in the course, where students can feel more assured that they have someone on hand available to provide immediate, just in time support and answers. This allows the learner to feel like the instructor is more readily available to them, which in turns results in them more likely being engaged in the course and its content. Therefore, the student leaves the course with a more positive overall perception of the course as it relates to instructional support.

6.4. Feedback

Feedback is one of the most important events of instruction (Gagné, 1965). It has long been known that specific and constructive feedback plays a vital role in learning, especially in online environments where students are expected to be more self-regulating. In fact, Butler and Winne (1995), states that feedback is an 'inherent catalyst' for all self-regulated activities, which aids to improve learning by informing students of their current achievements and guiding them on how to effectively accomplish the outlined learning objectives. Specific and constructive feedback from an instructor (or other support personnel) provides guidance to students in a time of need. Providing this timely and constructive feedback changes student perceptions of the course, to increase course satisfaction.

The most critical function of feedback, however, is to provide guidelines to the learner along the way of accomplishing a defined goal, allowing them to better be able to self-regulate their own learning (Narciss & Huth, 2004). Shute (2007) found that for feedback to be effective, some guidelines exist that must be employed. Some of the key points outlined in that study are as follows.

- Feedback should focus on the task (learning objective) not the learner
- Feedback should be unbiased, specific and clear
- Timing is key
 - For difficult tasks use immediate feedback

- Simple tasks use delayed feedback

Following the steps above as it relates to feedback among others, will help the learner to be able to better access their progress in a course and then makes step toward improving their performance if necessary. Consequently, the learner is to take charge of their own learning and thus develop a more personal and favorable learning experience.

7. Limitations and Future Research

The overall results of this study validate and add to previous research that students' perception of support is directly related to their course satisfaction and learning outcomes. However, limitations for this study exist that should be considered for future research to increase the generalizability of the results. One significant limitation of the study is that the participants were predominantly undergraduate students with public health related majors; therefore the results of this study may be applicable only to the population represented. Future research studies should extend over multiple course subjects and student classifications. Most importantly, though the results from this study show that students who have a positive perception overall course satisfaction, did well in terms of final grades further in depth studies also need to be conducted to determine exactly how student perceived support influences their overall learning outcomes in a course.

8. Conclusions

A significant body of literature has supported the assertion that communication in the classroom is central to the learning process (Baker, 2004; Moore & Kearsley, 2005; Saba, 2007). The findings of this study suggest and confirm that teachers should communicate what types of support are available to students and provide an easy way of accessing and taking advantage of the support. The level of instructional demands should be considered for teachers and instructional designers to determine the appropriate instructional support (Curley & Strage, 1996). Moreover, the use of support depends on student characteristics and the quality of support (Heift, 2006). For the study of context-sensitive help, Heift found that beginner learners sought more additional help than intermediate students in a computer-assisted language learning environment. Therefore, instructional demands, students' prior knowledge and skills, and self-directed and self-regulated learning experiences, and course contexts will affect students' needs for support in a learning environment.

Constructive feedback, responsive communication, tailored review/help sessions, and relevant instructional resources and activities are a few examples of instructional support. Also, encouraging peer interaction and support helps students to feel a sense of learning community. Furthermore, teachers also need appropriate mechanisms for addressing technical issues and problems that students may face in technology-enhanced learning environments. Managing the logistical and administrative endpoints of the online course is eased when consideration is given to not just the course content, timeline but also when due importance is given to the different facets of support and its implementation. Just as in planning the content for the course and ensuring online success, instructors and instructional designers have to give equal consideration in setting up the appropriate support mechanisms and infrastructure for students in case of technical mishaps.

Appendix A. Survey on students' perception of support and course satisfaction

| Category | Survey items |
|-----------------------|--|
| Instructional Support | <ol style="list-style-type: none"> 1. The course goals/objectives were clearly outlined. 2. I knew what I was expected to accomplish each week. 3. The instructor provided clear instructions for assignments and quizzes. 4. The course provided resources relevant to this course. 5. The feedback on the assignments was helpful. 6. I felt that I could ask any questions regarding the course materials to the instructor. 7. There were appropriate ways of communicating with the instructor. 8. I felt that the instructor was easily accessible. 9. The instructor encouraged students to be successful in this course. 10. The instructor responded to students' questions in a timely manner. |
| Peer Support | <ol style="list-style-type: none"> 11. I enjoyed the group discussions. 12. There were many opportunities to interact with peers. 13. I was hesitant to ask for help from other students. 14. I felt that I was respected by other students. 15. Students in this course were willing to provide help to other students. |
| Technical Support | <ol style="list-style-type: none"> 16. I had many technical issues in this course. 17. Asking for technical help was difficult for me. 18. I knew where to ask for help when I had any technical issues. 19. Technical support responded to my issues in a timely manner. 20. I felt that I could get technical support when I needed. |
| Course Satisfaction | <ol style="list-style-type: none"> 21. This course increased my interests in the subject. 22. I felt I achieved the objectives in this course. 23. I liked the course format (online). 24. I felt comfortable in this course. 25. I would recommend this course to others. |
| Open-ended Question | <ol style="list-style-type: none"> 26. How could this course support your learning better? |

References

- Ashwin, P. (2003). Peer Support: Relations between the context, process and outcomes for the students who are supported. *Instructional Science*, 31(3), 159-173.
- Baker, J. D. (2004). An investigation of relationships among instructor immediacy and affective and cognitive learning in the online classroom. *The Internet and Higher Education*, 7(1), 1-13.
- Baylor, A. L., & Kim, Y. (2005). Simulating instructional roles through pedagogical agents. *International Journal of Artificial Intelligence in Education*, 15(2), 95-115.
- Berge, Z. L., & Muilenburg, L. Y. (2001). Obstacles faced at various stages of capability regarding distance education in institutions of higher education: Survey results. *TechTrends*, 45(4), 40-45.
- Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research*, 65(3), 245-281.
- Chen, P.-S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of Web-based learning technology on college student engagement. *Computers & Education*, 54(4), 1222-1232.
- Collins, A., Brown, J. S., & Newman, S. E. (1989). Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics. In L. B. Resnick (Ed.), *Knowing, learning, and instruction: Essays in honor of Robert Glaser* (pp. 453-494). Hillsdale, NJ: Erlbaum.
- Curley, R. G., & Strage, A. A. (1996). Instructional support and demands: Helping teachers help students meet increasing academic standards. *Education*, 117(1), 128.
- Earwaker, J. (1992). *Helping and supporting students: Rethinking the issues*. Buckingham, UK: The Society for Research into Higher Education and Open University Press.
- Gagné, R. M. (1965). *The conditions of learning*. New York: Holt, Rinehart and Winston.
- Ge, X., Chen, C., & Davis, K. A. (2005). Scaffolding novice instructional designers' problem-solving processes using question prompts in a web-based learning environment. *Journal of Educational Computing Research*, 33(2), 219-248.
- Ge, X., & Land, S. (2003). Scaffolding students' problem-solving processes in an ill-structured task using question prompts and peer interactions. *Educational Technology Research and Development*, 51(1), 21-38.
- Goldschmid, B., & Goldschmid, M. L. (1976). Peer teaching in higher education: A review. *Higher Education*, 5(1), 9-33.
- Heift, T. (2006). Context-sensitive Help in CALL. *Computer Assisted Language Learning*, 19(2), 243 - 259.
- Koedinger, K. R., & Corbett, A. (2006). Cognitive tutors: Technology bringing learning sciences to the classroom. In R. K. Sawyer (Ed.), *The Cambridge Handbook of The Learning Sciences* (pp. 61-77). New York: Cambridge University Press.
- Küçük, M., Genç-Kumtepe, E., & Taşcı, D. (2010). Support services and learning styles influencing interaction in asynchronous online discussions. *Educational Media International*, 47(1), 39 - 56.

- Lee, J.-W. (2010). Online support service quality, online learning acceptance, and student satisfaction. *The Internet and Higher Education*, 13(4), 277-283.
- Moisey, S. D., & Hughes, J. A. (2008). Supporting the online learner. In T. Anderson (Ed.), *The Theory and Practice of Online Learning* (2nd ed., pp. 419-439). Edmonton, AB, Canada: AU Press.
- Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical Principles of Distance Education* (pp. 22-29). New York: Routledge.
- Moore, M. G., & Kearsley, G. (2005). *Distance education: A systems view* (2nd ed.). Belmont, CA: Thomson Wadsworth.
- Muilenburg, L. Y., & Berge, Z. L. (2005). Student barriers to online learning: A factor analytic study. *Distance Education*, 26(1), 29 - 48.
- Mullen, G. E., & Tallent-Runnels, M. K. (2006). Student outcomes and perceptions of instructors' demands and support in online and traditional classrooms. *The Internet and Higher Education*, 9(4), 257-266.
- Narciss, S., & Huth, K. (2004). How to design informative tutoring feedback for multimedia learning. In H. M. Niegemann, D. Leutner & R. Brünken (Eds.), *Instructional design for multimedia learning* (pp. 181-195). Münster: Waxmann.
- Rovai, A. P., & Downey, J. R. (2010). Why some distance education programs fail while others succeed in a global environment. *The Internet and Higher Education*, 13(3), 141-147.
- Saba, F. (2007). A systems approach in theory building. In M. G. Moore (Ed.), *Handbook of distance education* (pp. 43-57). Mahwah, NJ: Lawrence Erlbaum.
- Saba, F., & Shearer, R. L. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *American Journal of Distance Education*, 8(1), 36 - 59.
- Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education*, 49(2), 396-413.
- Shute, V. J. (2007). Focus on formative feedback (pp. 1-55). Princeton, NJ.
- Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *The Internet and Higher Education*, 7(1), 59-70.
- Thorpe, M. (2002). Rethinking learner support: The challenge of collaborative online learning. *Open Learning*, 17(2), 105-119.
- van Merriënboer, J. J. G., Kirschner, P. A., & Kester, L. (2003). Taking the load off a learner's mind: Instructional design for complex learning. *Educational Psychologist*, 38(1), 5 - 13.
- Wheeler, S. (2006). Learner support needs in online problem-based learning. *Quarterly Review of Distance Education*, 7(2), 175-184.

Table 1

Summary of Survey on Students' Perception of Support and Course Satisfaction

| Category | # of Items | Sample Items | Cronbach's Alpha |
|-----------------------|------------|---|------------------|
| Instructional Support | 10 | <ul style="list-style-type: none"> ▪ The instructor provided clear instructions for assignments and quizzes. ▪ The feedback on my assignments was helpful. ▪ I felt that I could ask any questions regarding the course materials to the instructor. ▪ I felt that the instructor was easily accessible. ▪ The instructor responded to students' questions in a timely manner. | 0.957 |
| Peer Support | 5 | <ul style="list-style-type: none"> ▪ There were many opportunities to interact with peers. ▪ I was hesitant to ask for help from other students. ▪ Students in this course were willing to provide help to other students. | 0.669 |
| Technical Support | 5 | <ul style="list-style-type: none"> ▪ Asking for technical help was difficult for me. ▪ I knew where to ask for help when I had any technical issues. ▪ Technical support responded to my issues in a timely manner. | 0.761 |
| Course Satisfaction | 5 | <ul style="list-style-type: none"> ▪ I felt I achieved the objectives in this course. ▪ I liked the course format (online). ▪ I would recommend this course to others. | 0.939 |

Table 2
Descriptive Statistics for Variables

| | <i>N</i> | <i>M</i> * | <i>SD</i> |
|-----------------------|----------|------------|-----------|
| Perception of support | | | |
| Instructional support | 107 | 4.18 | .95 |
| Peer support | 105 | 3.53 | .73 |
| Technical support | 108 | 3.94 | .70 |
| Course satisfaction | 106 | 4.30 | .83 |
| Final scores | 110 | 88.28 | 6.64 |

Note. * Responses on 5-point Likert scale; 1 = strongly disagree, 5 = strongly agree.

Table 3

Correlations among Students' Perceived Support, Course Satisfaction, and Final Scores

| | Course satisfaction | Final scores |
|-----------------------|---------------------|--------------|
| Instructional support | .659* | .086 |
| Peer support | .557* | -.028 |
| Technical support | .541* | .004 |

Note. * Correlation is significant at the 0.01 level (two-tailed).

Figure 1. A framework of student support for learning



Highlights

Support for student learning is a key element in optimizing student learning experiences in any learning environment. > We identified three categories of support and used in this study: instructional, peer, and technical support. > Student perception of support was significantly related to their overall satisfaction of the online course. > Teachers should communicate what types of support are available to students and provide an easy way of accessing the support.

ACCEPTED MANUSCRIPT