

AN EXAMINATION OF ONLINE INSTRUCTIONAL PRACTICES BASED ON THE LEARNING STYLES OF GRADUATE EDUCATION STUDENTS

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INTRODUCTION

Technology has changed the way individuals learn and teach. Due to a rising global interest in higher education (Altbach, Reisberg & Rumbley, 2009) many universities have adopted online learning as an acceptable medium for learning and teaching. Over the past few years, institutions of higher education have seen an increase of 66% in the demand for new courses and programs (Allen & Seaman, 2010).

As technology has evolved, the way individuals learn and the way instructors teach has changed. Despite the general consensus that learning styles and instructional preferences should be addressed in online learning, there remains a gap in the research into how different styles might be correlated with certain instructional preferences to improve the e-learning experiences. As learning transforms from tradi-

tional to online learning formats, new research is needed for an examination of the relationship between learning styles, instructional preferences, and online course design.

Background

The annual growth rate of online learning has consistently increased at a rate of 18.3% for the past few years (Padilla, Rodríguez, & Adams, 2011). According to a report published by the Babson Survey Research Group (Allen & Seaman, 2011), over 6.1 million students took at least one online course during the fall 2010 term. This was an increase of nearly one million students from the previous year's survey. Roughly one out of every three college students has taken at least one online course (Allen & Seaman, 2011). The numbers alone indicate that online learning reaches a sizable portion of the higher education population.

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In the midst of a steady increase in online learning enrollment, technology has become an integral part of learning environments. The integration of technology has had a major impact on the practice of teaching and learning (Khan, Graf, Weippl, Iqbal, & Tjoa, 2010). Graf and Kinshuk (2006) suggested a student's learning was impacted when his or her unique styles were considered in designing the curricular environment. Understanding the effects of learning styles and learners' perceptions of online instructional practices has the potential to improve the design and implementation of online educational experiences (Akdemir & Koszalka, 2008). All learners, regardless of age or learning environment have a predisposition to a preferred learning style (Zapalska & Brozik, 2007). This predisposition, influences how new information is acquired and processed (Kozub, 2010).

Problem Statement

Researchers have acknowledged that aligning students' instructional preferences to their learning style when designing course activities, helps the students learn more effectively (Graf, Viola, & Leo, 2007; Kolb, 2005). However, despite the general consensus that learning styles and instructional preferences should be addressed in online learning, there is a notable gap in the research into how different styles might be correlated with certain instructional preferences to improve the online learning experiences (Rhode, 2009). Compared to the traditional classroom, online learning is a relatively untested format. Online course design must take into account learning styles and instructional preferences of students to maximize effectiveness.

To stay competitive, many universities are rushing faculty to transfer traditional coursework to an online format without assessing learning styles and with little revision to instructional practices (Allen & Seaman, 2010; Featro, 2011). Many universities have ignored the need entirely to examine the relationship between learning styles, instructional prefer-

ences, and online learning (Akdemir, & Koszalka, 2008; Zhu, Valcke, & Schellens, 2009). This qualitative case study examined online learning at a small Midwestern university and detailed the learning styles and instructional preferences of graduate education students in an attempt to improve instruction practice.

Purpose

The purpose of this qualitative case study was to understand the perceptions of online learning based on the learning styles of currently enrolled online graduate education students. Designing courses to provide meaningful experiences based on the learning styles of students, as well as the unique approaches to teaching online is a contemporary concern for online learning (Wickersham, Espinoza, & Davis, 2007). This qualitative case study examined the overall aspects of online learning through the perceptions of online graduate education students with various learning styles in order to improve online instruction practices.

Data was collected through the VARK 7.1 questionnaire to determine the learning styles of online graduate education students. A group of 20 online graduate education students were purposively selected to equally represent each of the four learning styles: visual, aural, read/write, and kinesthetic. The purposively selected group of students was administered questionnaires to determine their perceptions of online instructional practices regarding individual, small and whole group activities. Semi-structured interviews were conducted with the purposively selected learners to triangulate the data. In addition, syllabi from online graduate education courses were analyzed to determine the current instructional practices used.

Research Questions

In an attempt to examine online instructional practices based on the learning styles of graduate education students, the following research questions were asked.

- Q1. What types of online instructional practices do graduate students with various learning styles prefer?
- Q2. How are the various learning styles of graduate education students related to the online instructional practice preferences?
- Q3. How do graduate education students describe their online learning experiences?
- Q4. What suggestions or ideas do online graduate education students have regarding online instructional practices that can address the various learning styles?

Nature of the Study

The purpose of this qualitative case study was to understand the perceptions of online learning based on the learning styles of online graduate education students. Data were collected regarding learning styles using the VARK 7.1 questionnaire. Student perceptions of instructional practices as identified using the Learning-Style Preference Questionnaire were collected from equally represented student learning style groups. Interview data was collected from learners regarding preferred instructional practices. Syllabi from online graduate education courses were analyzed to identify the instructional practices being implemented. Content analysis was conducted on all of the data to identify patterns and themes. All of the data collected were triangulated for analysis.

Significance of the Study

The ability to match a student's unique learning style with the preferred type of instructional environment is crucial (Rhode, 2009). The distance education environment has the potential to be as unique and engaging as the individuals that become part of the learning environment (Wickersham et al.,

2007). The preferences of the learner must be matched to the instructional practices that are best suited for that learning style if the student is to get the most out of the learning experience (Felder & Brent, 2010).

RESEARCH METHODS AND DESIGN

A single case study design was used to examine online instructional practices based on the learning styles of online graduate students. The embedded units of learning styles and instructional practices were examined in the study. A single case study design provided an appropriate theoretical framework to focus and guide the study (Yin, 2009). The empirical inquiry was grounded in understanding graduate education students' experiences and perspectives of why and how the online learning environment should be designed (Creswell, 2009; Yin, 2009).

Participants

The participants for this study came from a population of students who were enrolled in online graduate education courses at a private, 4-year institution, located in the Midwest. Syllabi from all the online graduate education courses were reviewed to identify the instructional practices implemented.

The institution provided a pool of 67 potential participants who met the qualifications of the purposeful sample. From this pool of potential participants, 62 online graduate students agreed to participate. The students ranged in age from 21 years and older, and were diverse in demographics, gender, income, and ethnicity.

Purposive sampling was used to identify participants for phone interviews. While every attempt was made to have equal representation of the learning style types, only four read/write learning style type participants volunteered for an interview.

Materials/Instruments

Learning Style Questionnaire. All participants were asked to complete the VARK 7.1 to identify their learning styles. The VARK 7.1 is a nonforced choice scale questionnaire that measures an individual's preference for taking in, and putting out information in a learning context. The learning styles measured are visual, aural, read/write, and kinesthetic.

Online Instructional Practice Questionnaire. All participants were asked to complete the Learning-Style Preference Questionnaire; a 5-point Likert scale instrument varying from very well to badly to determine how well students perceive they learn from various online instructional practices. The instructional practices were categorized according to instructional setting; whole group, small group, and individual activities.

Document Review. Syllabi from online graduate education courses were obtained and analyzed to identify the instructional practices implemented.

Semistructured Interview. Semistructured interviews were conducted via phone calls to allow for the opportunity to ask additional probing questions and allow the participants the opportunity to share in-depth their online learning experiences.

Data Collection, Processing, and Analysis

Data collection was initiated through e-mails to potential research participants to assess their interest. A total of 62 online graduate students agreed to participate. Purposive sampling was used to identify a sample size of 20 participants for phone interviews.

The study used a cross-case analysis of the case studies to examine the overall aspects of online learning based on the learning styles of online graduate education students in an effort to improve online instruction practice. The data was examined for within-group similarities and differences. The questionnaires and interview data from the students were paired together and

compared. The similarities and differences in each pair were then categorized. Patterns in the data were noted and coded into themes.

RESULTS

The purpose of the case study was to understand the perceptions of online learning based on the learning styles of online graduate education students. By having a clearer understanding of these perceptions, then meaningful instructional practices could be developed for online courses.

Learning Styles. The results from the VARK 7.1 learning style inventory were used to identify the learning styles of the online graduate education students. The VARK 7.1 identified 45% of the online graduate students as visual learners. Multimodal learners combine more than one preferred learning style (Fleming, 2010). About 18% of the online graduate education students were identified as multimodal learners. Multimodal learners tend to be able to match their preferences with whatever instructional practices are being used (Fleming, 2010). Students who were identified as multimodal learners were rendered invalid because they did not fit within the parameters of the study. Learning style findings are displayed in Table 1.

Instructional preferences. The results of the Instructional Practice Questionnaire were used to collect data concerning what types of online instructional practices do graduate students prefer. Participants rated themselves on how a well they perceived they learned from various online instructional practices on a 5-point Likert scale, varying from very well to badly. The data was disaggregated into three different instructional settings: whole class, individual, and small group. Instructional practice preferences are displayed in Table 2.

Learning Styles and Instructional Practices Relationships. Data from the Syllabi Instructional Practice Coding Sheet were used to collect data. Syllabi from 100% of online graduate education courses offered were ana-

TABLE 1
Learning Style Preferences

<i>Learning Style</i>	<i>Response Rate^a</i>
Visual	23
Aural	8
Read/write	10
Kinesthetic	10

^a*n* = 51.

TABLE 2
Instructional Practice Preferences

	<i>Very Well</i>	<i>Well</i>	<i>OK</i>	<i>Not Well</i>	<i>Badly</i>	<i>Average Rating^a</i>
Whole Class						
Lecture/PowerPoint presentation	43.1%	43.1%	9.8%	3.9%	0%	4.25
Threaded discussion board	9.8%	25.5%	51%	13.7%	0%	3.31
Asynchronous video presentation or podcast	5.9%	35.3%	49%	9.8%	0%	3.37
Individual						
Research papers/essay writing	23.5%	29.4%	33.3%	9.8%	3.9%	3.59
Exams	5.9%	21.6%	52.9%	15.7%	3.9%	3.10
Case studies	21.6%	49%	24.9%	0%	0%	3.92
Video demonstrations	14%	40%	24.9%	10%	0%	3.58
Reading textbooks/journals etc.	11.8%	25.5%	47.1%	15.7%	0%	3.33
Web/phone conferences	4.1%	34.7%	38.8%	22.4%	0%	3.20
Simulations/interactive games	39.2%	39.2%	19.6%	2%	0%	4.16
Wikis or blogs	2%	38%	42%	18%	0%	3.24
Small Group						
Synchronous discussions	9.8%	52.9%	29.4%	7.8%	0%	3.65
Asynchronous discussions	2%	41.2%	45.1%	11.8%	0%	3.33
Collaborative assignments	27.5%	35.3%	31.4%	5.9%	0%	3.84
Case studies	17.6%	56.9%	23.5%	2%	0%	3.90
Simulations/interactive games	39.2%	43.1%	13.7%	3.9%	0%	4.18

^a*n* = 51.

lyzed to determine the types of instructional practices implemented. The instructional practices implemented in the online courses were then analyzed to determine the principal learning style and the frequency of occurrence. This analysis resulted in a combined total of 66 instructional practices.

In an analysis of the principal learning styles represented in the instructional practices found within the online graduate education course syllabi, it was determined that the read/write learning style was overwhelmingly

emphasized in 85% of the assignments. The kinesthetic learning style was not represented in any online instructional activities. Three of the instructional strategies were determined to be multimodal; meaning more than one dominant learning style was emphasized in the completion of the assignment. The principal learning styles emphasized in the instructional practices found in the course syllabi are displayed in Table 3.

In addition to examining the principal learning styles emphasized within each

TABLE 3
Principal Learning Styles Emphasized in Instructional Practices

<i>Learning Style</i>	<i>Occurrence^a</i>
Visual	7%
Aural	3%
Read/write	85%
Kinesthetic	0%
Multimodal	5%

^a*n* = 66.

TABLE 4
Frequency of Instructional Practices in Syllabi

<i>Instructional Setting</i>	<i>Instructional Practice</i>	<i>Frequency of Occurrence^a</i>
Whole class instructional practices	Lecture/PowerPoint presentation	8%
	Threaded discussion board	3%
	Asynchronous video presentation or podcast	9%
Individual instructional practices	Research papers/essay writing	18%
	Exams	3%
	Case studies	14%
	Video demonstrations	11%
	Reading textbooks/journals etc.	17%
	Web/phone conferences	0%
	Simulations/interactive games	2%
	Wikis, or blogs	3%
Small group instructional practices	Synchronous online discussions	2%
	Asynchronous online discussions	6%
	Collaborative assignments	3%
	Case studies	2%
	Simulations/games	2%

^a*n* = 66.

instructional practice, the occurrence of each instructional strategy was also analyzed to determine the frequency of use. By analyzing the occurrence of each instructional strategy, the frequency of use was determined. The results collected from the online course syllabi instructional practices frequency of use are displayed in Table 4.

Routinely, activities that involved the use of writing and posting reflection papers, reading chapters from the textbook and submitting

written research papers were listed in the course syllabi. The instructional practices of case studies, threaded discussions, and web or phone conferences were rarely implemented in the analyzed course syllabi. Instructional practices that favored the read/write learning style were used overwhelming 85% of the time. The disconnection between the instructional practices and the preferred learning style of online learners seemed to create quite a chasm. However, once the personal interviews were con-

ducted and analyzed, it became apparent that while some connection to the preferred learning style of the online learner and the perceptions of the online learning experiences existed, it was really the real-world connection to learning that had an impact on the online experience.

Online Learning Experiences. The majority of the students described their online learning experiences as good and having had a positive influence on their learning. Several themes emerged as the data was analyzed.

The theme of the instructor was noted as both a source of help and frustration. Student1V “really enjoyed” the learning experiences and “the instructor was great.” Student5K commented, “I missed the immediate one-on-one communication with the instructor. It is very frustrating having to wait to have a question answered.”

Flexibility was another theme that was coded as both helpful and frustrating. Many of the students interviewed made some reference to the ability to be flexible with their work schedules and other demands of daily life. StudentV6 said, “I have had a great experience with the class that I took online. It was a great learning experience. I liked that I could work from home and not have to drive to class. The details for each assignment were very helpful.” Student5V recognized the need for “a lot more dedication as a learner.”

While the majority of the students described their online learning experiences as overall effective, technical issues associated with online learning, the lack of accessibility to the instructor and personal interactions were cited as frustrating experiences. In addition, some of the students described their online experiences as bad. Student2A commented, “I do not like online classes. I learn far more going to class and being able to interact with the teacher and the other students.”

The majority of the students indicated that online learning had influenced their learning. Themes included the increased accountability as a student, a new independence and autonomy for learning, and exposure to a variety of

instructional practices and perspectives. Again, the same students that described their online experiences as unfavorable also commented that online learning had not influenced their learning in a positive way.

Suggestions for e-Learning. The suggestions and ideas generated by the students during the phone interviews fell into three main themes: minimum requirements for coursework and instructor contact, varied instructional practice suggestions, and the request for more online course offerings. In general, the majority of the students described positive learning experiences. The use of technology to provide for an educational opportunity was appealing to most students interviewed. Some of the students interviewed suggested having some type of minimum requirements for coursework to ensure continuity between courses offered online versus in a traditional classroom. In addition, students also suggested having some type of minimum guidelines in terms of instructor contact with regard to turn around time for assignments and responding to communication.

The request for additional online courses was notable. Many requested the online format to fit into their already busy life styles. Others simply preferred the convenience of learning at their own pace. Whatever the reason given for choosing online learning, the majority of the students interviewed had completed at least two or more online courses previously.

The majority of participants suggested the use of instructional practices that emphasize authentic interaction between the students and instructor. These recommendations included the specific instructional practices involving more discussion board forums, podcasts, case studies, collaborative projects, and the use of video interaction. The theme of authentic, real-world connection to the activities was noted most. Student5A summed up the consensus echoed in most interviews by saying, “A variety of instructional practices provide for a richer learning experience. One instructional practice alone does not provide for a rich learning experience.”

Oomen-Early and Murphy (2009) recommended online faculty must acquire a distinct skill set in order to achieve success online. Discussion boards were mentioned as preferred by over half of the interviewed students. An analysis of the course syllabi data found discussion boards to be used in only 3% of the total course activities. Zapalska and Brozik (2007) suggested that online courses lend themselves to text-based instruction. Student differences toward learning can stem from areas of general skills, aptitude, information processing, or how students apply information to new situations.

CONCLUSIONS

The study results reinforce the supposition that students learn when they are engaged. The perceptions of online learners concurred that meaningful experiences should be developed for online courses. Currently, the read/write learning style is often the main learning style addressed in online learning instructional practices. The findings of this study showed heavy read/write instructional practices being implemented even though the majority of the students did not favor that learning style. The study also indicated regardless of the preferred learning style, instructional practices that were engaging and related to real-world experiences were favored.

The outcome of the study also validates the importance of the use of multiple technologies to appeal to multiple learning styles (Green et al., 2010). In addition, the study supports the use of the online learning environment and its associated tools to create situations where theory and practice become integrated. This integration helps to create opportunities that support the characteristics of adult learners. The findings were supported by literature suggesting that to improve course effectiveness, multiple instructional practices must be implemented into the course design in order to reflect the diversity of learning styles that are represented online environments (Romanelli,

Bird, & Ryan, 2009; Zapalska & Brozik, 2007).

REFERENCES

- Akdemir, O., & Koszalka, T. A. (2008). Investigating the relationships among instructional strategies and learning styles in online environments. *Computers and Education*, 50(4), 1451-1461. doi:10.1016/j.compedu.2007.01.004
- Altbach, P. G., Reisberg, L. & Rumbley, L. E. (2009). Trends in global higher education: Tracking an academic revolution. A report prepared for the UNESCO 2009 World Conference on Higher Education. Retrieved from <http://unesdoc.unesco.org/images/0018/001831/183168e.pdf>
- Allen, E., & Seaman, J. (2010). *Learning on demand: Online education in the United States*. Retrieved from Babson College and The Sloan Consortium website <http://sloanconsortium.org/publications/survey/pdf/learningondemand.pdf>
- Allen, E., & Seaman, J. (2011). *Going the distance: Online education in the United States 2011*. Retrieved from Babson College and The Sloan Consortium website: <http://www.babson.edu/Academics/centers/blank-center/global-research/Documents/going-the-distance.pdf>
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: SAGE.
- Featso, S. (2011). The relationship between learning styles and student learning in online courses. In M. Koehler & P. Mishra (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2011* (pp. 266-273). Chesapeake, VA: AACE.
- Felder, R., & Brent, R. (2010). The national effective teaching institute: Assessment of impact and implications for faculty development. *Journal of Engineering Education*, 99(2), 121-134.
- Fleming, N. D. (2010). VARK: A guide to learning styles. Retrieved from <http://www.vark-learn.com/english/index.asp>
- Graf, S., & Kinshuk. (2006). An approach for detecting learning styles in learning management systems. In *Sixth IEEE International Conference on Advanced Learning Technologies* (pp. 161-163). New York, NY: IEEE Press.
- Graf, S., Viola, S. R., & Leo, T. (2007). In depth analysis of the Felder Silverman learning style

- dimensions. *Journal of Research on Technology in Education*, 40(1). Retrieved from http://www.iste.org/Content/NavigationMenu/Publications/JRTE/Issues/Volume_401/Number_1_Fall_2007/InDepth_Analysis_of_the_FelderSilverman_Learning_Style_Dimensions.htm
- Green, N. C., Edwards, H., Wolodko, B., Stewart, C., Brooks, M., & Littledyke, R. (2010). Reconceptualising higher education pedagogy in online learning. *Distance Education*, 31(3), 257-273. doi:10.1080/01587919.2010.513951
- Khan, F. A., Graf, S., Weippl, E. R., Iqbal, T., & Tjoa, A. M. (2010). Role of learning styles & affective states in web-based adaptive learning environments. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010* (pp. 3896-3905). Chesapeake, VA: AACE.
- Kolb, A. Y. (2005). *The Kolb learning style inventory*—version 3.1 2005 technical specifications. Boston, MA: Hay Resource Direct.
- Kozub, R. M. (2010). An ANOVA analysis of the relationships between business students' learning styles and effectiveness of web based instruction. *American Journal of Business Education*, 3(3), 89-98.
- Oomen-Early, J., & Murphy, L. (2009). Self-actualization and e-learning: A qualitative investigation of university faculty's perceived barriers to effective online instruction. *International Journal on E-Learning*, 8(2), 223-240. Chesapeake, VA: AACE.
- Padilla Rodriguez, B. C., & Adams, J. (2011). Acceptance of online degrees by undergraduate Mexican students. In T. Bastiaens & M. Ebner (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011* (pp. 238-246). Chesapeake, VA: AACE.
- Rhode, J. F. (2009). Interaction equivalency in self-paced online learning environments: An exploration of learner preferences. *The International Review of Research in Open and Distance Learning*, 10(1), 1-13.
- Romanelli, F., Bird, E., & Ryan, M. (2009, February). Learning styles: A review of theory, application, and best practices. *American Journal of Pharmaceutical Education*, 73(1), 1-5. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690881/pdf/ajpe9.pdf>
- Wickersham, L., Espinoza, S., & Davis, J. (2007). Teaching online: Three perspectives, three approaches. *AACE Journal*, 15(2), 197-211. Chesapeake, VA: AACE.
- Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: SAGE.
- Zapalska, A., & Brozik, D. (2007). Learning styles and online education. *Campus-Wide Information Systems*, 24(1), 6-16. doi:10.1108/10650740710726455
- Zhu, C., Valcke, M., & Schellens, T. (2009). Cultural differences in the perception of a social-constructivist e-learning environment. *British Journal of Educational Technology*, 40(1), 164-168. doi:10.1111/j.1467-8535.2008.00879.x

