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ABSTRACT

An exploration of student personality traits and learning preferences was conducted in relation to perceptions of online learning. Two sections of a teacher education course at the University of Montana-Missoula received traditional instruction during weeks 1 through 7 of the semester. During weeks 8 through 11, 1 section (n=36) continued to receive traditional instruction, while the other (n=28) received 1 weekly session via computer-mediated communication. Results indicate that the majority of students in the online section did not perceive they learned as much as they might have in a traditional format. Effect size analysis did not support these perceptions, as important differences between the sections in concept attainment were not indicated. Furthermore, personality traits deemed advantageous for learning online (extroversion, intuition, thinking, and judging) did not appear to impact achievement, and yet, student satisfaction with online learning was greater among those who indicated at least three of the four advantageous learning preferences. (Contains 3 tables and 27 references.) (Author/SLD)

Online Learning: Personalities, Preferences and Perceptions

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Abstract

An exploration of student personality traits and learning preferences was investigated in relation to perceptions of online learning. Two sections of a teacher education course at the University of Montana-Missoula received traditional instruction during weeks one through seven of the semester. During weeks eight through eleven, one section (n=36) continued to receive traditional instruction while the other (n=28) received one weekly session via computer-mediated communication (CMC). Results indicated that the majority of students in the online section did not perceive they learned as much as they might have in a traditional format. Effect size analysis did not support these perceptions, as important differences between the sections in concept attainment were not indicated. Furthermore, personality traits deemed advantageous for learning online (extroversion, intuition, thinking and judging) did not appear to impact achievement, and yet, student satisfaction with the online opportunity was greater among those who indicated at least three of the four advantageous learning preferences.

"Excuse me, Professor, could you tell me where our online class meets?" Glancing up from my computer I was confronted with a backpack-laden student struggling to catch her breath from the hike up to my third floor office. I recognized her as one of the 28 students selected to participate in an experimental, online section of an Introduction to Exceptionality course I was teaching that semester. "Have a seat," I said, nodding toward my snowshoe rocker, "and let me explain a few things." As it turned out, this type of teacher-learner interaction was to become all too familiar among my students involved in their first online experience.

Clearly, perceptions of online learning vary widely according to an individual's technological experiences and expertise (Phipps & Merisotis, 1999). As indicated by the student above, making the conceptual transition from a familiar, conventional instructional format to a virtual learning environment can be confusing and challenging at best. Currently, this challenge is being addressed in higher education institutions where the distance learning revolution continues to grow by leaps and bounds. Recent predictions by the International Data Corporation (1999) suggested that distance learning offerings will reach 2.2 million students by 2002, a dramatic increase from the reported 710,000 distance learning students in 1998. If such predictions hold true, the anticipated growth rate of distance education programs offered by higher education institutions will jump from the moderate 62% reported in 1998 to an overwhelming 84% in 2002. For this reason alone, research studies that address the growing trend toward virtual teaching and learning are very much in order.

Over the past decade, distance education research has focused on traditional versus technology-driven delivery formats, and the media and methods utilized in virtual instruction have become increasingly complex, eclectic and largely based on economic considerations and technological advances, with far less attention paid to theory-driven, empirically-based

guidelines (Cyrs, 1997; Moore and Kearsley, 1996). In fact, much of the research to date surrounding distance learning has focused on descriptive comparisons of instructional delivery methods which rely primarily on technology (internet, web, computer-mediated communication) versus those that do not (e.g. traditional, face-to face classroom teaching) (Berge and Mrozowski, 2001, Phipps & Merisotis, 1999). Results from this evolving body of comparative research have generated findings consistent with a "no significant difference" conclusion and have been summarily dismissed with the notion that the distance delivery system is typically a non-issue and quite likely, has minimal, if any, effect on learning (Russell, 2000; Moore and Thompson, 1997). In response to this phenomenon, Smith and Dillon (1999) warn that such conclusions may in fact be focusing only on the tip of the iceberg in terms of the virtual learning impact, which should not be confused with academic achievement typically measured by test scores. Saba (1999) adds to this discussion with the recommendation that distance education research needs to reduce its focus on aggregate data that serve to wash out any significant effects and instead concentrate on trends that emerge from specific variables that interact over time and distance with the individual learners.

The director of the American Center for the Study of Distance Education, Michael G. Moore, agrees as he notes, "People sometimes think of distance education as technology, but it's not that at all," explained Moore. "Technology just drives it. Distance education is a different paradigm of teaching and learning. It's about teacher-learner relationships and learner-learner relationships." (www.ed.psu.edu/acsde/expand.asp).

In fact, research that specifically investigates distance learner characteristics, such as motivation, learning styles and personality traits, was originally recognized several decades ago by theorists such as Charles Wedemeyer (1971), who proposed the theory of the independent

learner in relation to distance education. He proposed specifically that distance learning pedagogy must focus on the individual learner and that the teaching process must focus on individual learner needs with respect to communication, pacing of instruction and convenience. More recently, learning styles and learner satisfaction have been identified as critical variables in the success of effective distance education, however empirical research continues to remain sparse (Navarro and Shoemaker 2000; Saba, 2000; Saba & Shearer 1994; Smith and Dillon 1999). The need to explore and relate well-known effective teaching/learning strategies within the traditional classroom (i.e accommodating for learning style differences) to those demonstrated across virtual environments, is necessary in order to develop a complete picture of any potential discrepancies, and hence any impact on learning inherent in the two approaches (Phipps & Merisotis, 1999).

Previous studies that have compared perceptions of satisfaction and performance of learners at a distance with traditional classroom learners have reported minimal, if any, significant discrepancies related to variables such as age, gender, ethnicity, academic background, computer skills, and academic aptitude (Moore and Thompson 1997; Navarro and Shoemaker 2000; Russell 2000). In 1999, Swan (2001) analyzed surveys from students enrolled in 73 distance education courses and found that the three primary factors which heavily influenced student's satisfaction included clarity of course design, frequent interaction with instructors, and active discussion among learners. Student's learning preferences and personality traits have also been explored and related to learner satisfaction and success online (Atman 1988; Dewar and Whittington, 2000; Erhman,1990). Successful distance teaching obviously must address a wide range of learning preferences, however, Atman (1988) noted that certain personality traits, based on the Myers-Briggs Type Indicator (MBTI) might be more

advantageous for online learning than others (Canfield, 1976; Jung, 1971; Myers & McCaulley, 1985). Her study suggested that students with learning preferences for extroversion, intuition, thinking and judging (ENTJ) appeared to have the potential to be more successful in achieving their academic goals.

The purpose of this research was to investigate individual student learning preferences, based on identified MBTI personality types, and to relate these preferences to advantageous distance learner indicators. In this study, individual learner preferences were analyzed in relation to students' perceptions of distance learning achievement and then compared to individual and group evaluative results of multiple objective measures of concept attainment. Additional student perceptions of asynchronous and synchronous activities during online delivery were reviewed in terms of instructor/learner control and pacing requirements, as well as, learners' satisfaction with access to the content, to each other and to the instructor (Moore and Thompson 1991; Moore and Kearsly, 1996). Questions to guide the study included 1) What differences exist between students' perceptions of online learning and their actual achievement on distance learning tasks? and, 2) What effect does a student's MBTI learning preference have on satisfaction with online learning?

METHODS

PARTICIPANTS

The participants for this quasi-experimental study consisted of all students enrolled in two sections of C & I 410 Exceptionality and Classroom Management during the Spring semester, 2001. Classes were held on the campus of the University of Montana-Missoula. Also held constant for both sections were the course materials, syllabus, assignments, and the instructor. One section (n=36) met for three hours, once a week, and was selected as the control

(traditional) group. The other section (n=28) met twice weekly, for 90 minutes, and served as the experimental (online) group.

Demographic data indicated that both sections were closely matched in terms of age, gender, G.P.A., teacher certification area, and ethnicity (Table 1). Both classes evidenced a range of ages (20-46 years), with the traditional group averaging 24.3 years and the online section averaging 25.1 years. With respect to gender, females outnumbered males in both sections, (72% traditional and 57% online), which was consistent with most teacher education classes. Student mean G.P.A. was reported to be 3.46 in the traditional section and 3.54 in the online group, with comparable ranges of 2.84-4.0 and 2.6- 3.9, respectively. Elementary certification students (66%)exceeded secondary area students (34%) in the traditional section, while the online section was more balanced in the opposite direction (elementary 46%; secondary 54%). With respect to ethnicity, minimal diversity was noted in both sections, as white students were reportedly 94% and 93% in each class. Overall, demographic information indicated that the two groups of students in this study were largely homogeneous.

Table 1: Demographics

	Traditional (FtF) (n=36)	Online (OL) (n=28)
Age	24.3	25.1
Male	28%	43%
Female	72%	57%
GPA	3.46	3.54
Elementary	66%	46%
Secondary	34%	54%
Ethnicity:		
White	94%	93%
Hispanic	3%	3%
Native American	3%	3%

In the online group, all 28 (100%) of the students reported that this was their first online learning experience, however, 10 (36%) had taken or were currently enrolled in a required C & I

306 Instructional Media course. This course covers a variety of topics including using email, connecting to the Internet, search engines and sending attachments, skills relevant to online success. During the study, 14 of the students (50%) reported that they completed the online course assignments at home, while 12 (43%) worked in campus computer labs and two (7%) worked in several places. Eleven students (39%) noted that they did not need assistance with the technology, while eight students (29%) utilized peers for assistance, eight students (29%) utilized peers and professors, and one student solicited help from a relative.

INSTRUMENTATION

Two instruments were utilized for data collection during the course of this study. The Myers-Briggs, Modified Keirsey Temperament Sorter, was accessed by students via the Internet, in order to establish their learning preferences (www.humanmetrics.com). The second instrument utilized for data collection was the Student Perceptions of Online Learning (SPOOL) questionnaire, which was developed by the researchers in response to satisfaction criteria established in recent distance education literature (Dewar & Whittington, 2000; Moore & Thompson, 1997; Phipps & Merisotis,1999, Swan,2001).

The Myers-Briggs Modified Keirsey Temperament Sorter is a modified online version of the original Myers-Briggs Type Indicator (MBTI) developed by Isabel Myers and Katherine Briggs in 1985. This instrument was developed to identify and understand the differences and similarities in human personalities and is categorized along four primary dimensions of learner preferences or styles: extroversion/introversion (E/I); sensing/intuition(S/N); thinking/feeling (T/F) and judging/perceiving(J/P). These four dimensions have been found to be particularly useful in promoting an understanding of cognitive, affective and behavioral differences in learning performance and learner engagement (Ehrman, 1990). With respect to developing

online instructional strategies, it is important to recognize that student's learning tendencies must be considered as a prerequisite for achieving effective outcomes. For example, extroverted individuals tend to respond best to group activities, while introverted individuals may prefer lectures; sensing individuals prefer structured syllabi and lessons, while intuitive learners prefer open-ended discussion formats; thinkers generally prefer facts while feelers may be more comfortable with simulations and role-plays; and finally judging individuals respond best to formalized instruction, whereas perceiving individuals prefer independent and more creative methods of processing new information. For a more in-depth description of these learner preferences and personality traits refer to the Humanmetrics web site (www.humanmetrics.com)

At the conclusion of the study, students in the online section (n=28) completed the questionnaire, Student Perceptions of Online Learning (SPOOL) developed by the researchers (Figure One). To reduce bias and to ensure confidentiality of student responses, the questionnaire was administered and analyzed by the second author of this study, who was not the course instructor. The design of the 10-item, Likert-based questionnaire was grounded on three key factors of satisfaction in distance learning: clarity of course design, access to the instructor and interactivity among participants (Swan, 2001). Items also addressed Moore's transactional distance learning model of interactivity related to perceptions of learner-learner, learner-instructor and learner-content satisfaction (Moore, 1973). Questionnaire results were entered into Excel spreadsheets and analyzed using descriptive statistics, including frequency distributions and effect sizes, where appropriate. Cohen's (1988) effect size (ESs) analysis provides a measure of the relative importance, or magnitude, of the observed differences by comparing the mean differences between groups. Values near .2 represent relatively small differences, while values near .5 and .8 are considered medium and large differences (Glass, McGaw & Smith, 1981).

Figure 1: Student Perceptions of Online Learning

Code:_____ Personality Type:_____

Student Perceptions of Online Learning
(SPOOL)

Background Information:

GPA___ Age___ Gender___ Ethnicity___

Certification area: Elementary___ Middle___ Secondary___
If Middle or Secondary then: Content Area _____

C & I 306 (Instructional Media) completed: yes____ no____ or currently enrolled_____

This online learning class experience in C & I 410 is my: 1st____ 2nd___ or 3rd(or more)___

I completed most of the online assignments using a computer:
at home ____on campus____ other (specify location): _____

When I needed assistance with the technology I would ask:
No assistance needed_____ peers_____ relatives_____ lab personnel_____ professor_____
Blackboard HELP site_____ Other (specify)_____

The amount of time I spent on the online assignments each week was approximately:
less than one hour _____ one to one and a half hours_____ more than two hours_____

Questionnaire:

Using the rating scale below select the **BEST** response for each item.

Scale: 4-Strongly agree, 3-Agree, 2-Disagree, 1-Strongly disagree

1. Once I became used to the technology I was able to participate successfully in the assigned activities during the designated time period. _____
2. Online assignments were outlined clearly by the professor. _____
3. When completing the online assignments I was able to contact the professor for clarification. _____
4. The use of **email** was effective for communicating with my group. _____
5. The use of the **discussion forum** was effective for the exchange of ideas about the assigned topics. _____
6. The use of the **chat session** was effective for analyzing case studies and reaching consensus on goals. _____
7. I would consider taking an online course in the future. _____
8. The overall group interactions during the online class sessions contributed to my learning. _____
9. My personal interactions during the online class sessions contributed to my learning. _____
10. I learned as much from the activities completed online as I might have from the same activities completed in a traditional classroom setting. _____

Comments: Please make any comments on the back of this page (Thanks!). →

PROCEDURES

In terms of the instructional format each class section received traditional, face-to face (FtF) instruction during weeks one through seven of the semester. Graded assignments in both sections during this time period included one research paper on a selected disability and one multiple-choice exam designed to assess the students' knowledge of exceptionality issues. During weeks eight through eleven, one section (n=36) continued to receive traditional, face-to-face instruction (FtF) while the other section (n=28) received one weekly session face to face and one weekly session via online learning (OL) activities, including email, chat sessions, threaded discussions and web assignments. Hence, online students participated in a total of four class sessions (approximately 6 hours) via distance learning. Data collected from both sections during the four weeks of experimental instruction included individual and group achievement scores from six case study learning tasks. These tasks included:

1) "Response to Esther": an individual written response to a kindergarten teacher regarding her role and responsibilities in meeting the needs of a student with multiple disabilities in her classroom;(OL-email)
2) "Toby": a group discussion and written recommendations for classroom pre-referral interventions related to behavioral and academic concerns;(OL-threaded discussion)
3) "Modification Decision Hierarchy for Peter": an individual written response selecting the appropriate level of modification and support for a student with cognitive delays;(OL-email)
4) "IEP Goals for Peter": a group discussion and written response outlining three goals;(OL-chat)
5) "Externalizing and Internalizing Behaviors": a group discussion and written response identifying specific behavioral concerns and possible management solutions;(OL-threaded discussion)
6) "Management Strategies": a group written response detailing classroom management strategies for a student with emotional concerns;(OL-chat)

Each learning task was graded using a scoring rubric for written responses as follows: 3=accurate and complete response; 2=accurate information, incomplete response and 1=inaccurate information, incomplete response. Online students submitted their assignments via email or

through threaded discussion and chat sessions. Traditional students submitted their responses during class and were allowed additional time outside of class to complete the assignments.

During the final five weeks of standard instruction students also completed one multiple-choice exam designed to assess knowledge of classroom management principles and another research paper related to management models and theories. In total there were 10 academic achievement data points to compare for the two sections.

RESULTS

When group mean achievement scores for exams and research papers were compared for the two sections the results were consistent with the distance learning "no significant difference phenomenon" (Russell, 2000). The first exam scores for the traditional group (n=36) averaged 90.7 compared to 89.1 for the online group (n=28), resulting in a small effect size of .31. The second exam, administered after the online sessions, resulted in mean scores of 90.8 and 89.9, respectively, with a similarly small effect size of .25. First and second research paper means yielded comparable results with the traditional group achieving a mean of 96% and 95% on each of the papers, while the online section achieved 95% and 96%, respectively. Effect size analysis again revealed small differences (.43 and .38) between the groups' achievement on these measures indicating no significant difference in overall concept attainment between groups.

In analyzing the achievement of all students on the six learning tasks completed during the online experiment, moderate to large differences were noted between the groups in two of the six tasks. Specifically, the online students (OL) scored higher in terms of accuracy of response on one of the individual email tasks (Task One: "Response to Esther": FtF mean score=1.73; OL mean score= 2.2; effect size =1.02) and students in the traditional (FtF) section scored higher on a similar individual task (Task Three: "Modification Decision Hierarchy for Peter": FtF mean

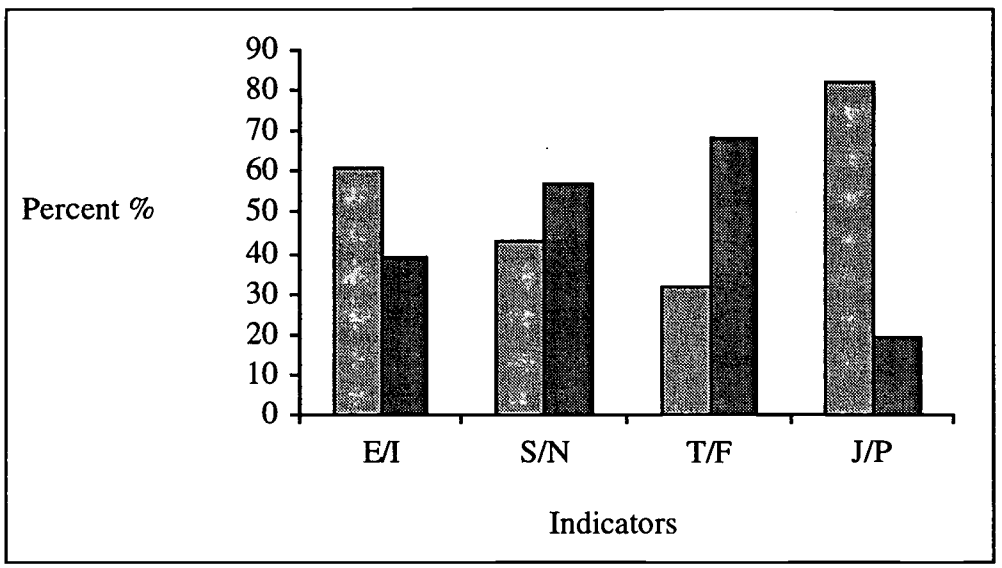
score=2.88, OL mean =2.41 effect size=1.42). The researchers identified several variables that may have affected these noteworthy differences including additional time to study the text and reflect on a response (Task One: OL group) versus the expectation for an immediate response while under peer pressure (FtF group). It was also noted that the more accurate responses from the traditional group may have occurred on the modification task (Task Three) due to immediate access to additional clarifying information from the instructor during the FtF class session. Effect size differences in the other four tasks were under.3 and thus were not indicative of important differences in concept attainment between the two groups. Overall, results from the ten academic achievement measures indicated that there were no significant differences between groups regarding concept attainment.

In response to the research question regarding achievement and perceptions, it is important to note that on the SPOOL questionnaire item 10 (Figure 1), 17 (61%) of the online learning students perceived that they had not learned as much as they might have in a traditional setting. Examples of related comments included statements such as "I personally don't believe in teaching through computers (computers have no personality, affection, or understanding abilities)"; "I feel like I learn and acquire material better in a traditional classroom. I have a hard time concentrating with the computer teaching me (not a human)"; and "The online technology is great and very useful, but it still does not replace the knowledge and experience gained from a real classroom with real people and real minds." Clearly, some students were less than enthusiastic about this online learning opportunity.

The second research question addressed students' MBTI personality indicators and learning preferences related to satisfaction with online learning. In terms of personality indicators found to be advantageous for distance learning, Atman (1988) noted that individuals

with extroversion, intuition, thinking and judging (ENTJ) preferences tended to be more satisfied with an online learning format, primarily because they seemed more competent in planning, pursuing and completing their academic goals. Of the 28 students participating in the online section of this study, 25 (89%) had two or more of the four type indicators (extroversion, intuition, thinking and judging); 12 (42%) had three of these indicators and 1(4%) had all four indicators. More specifically, personality types and learner preferences were distributed among the 28 students as follows: Extrovert 17 (61%), Introvert 11 (39%); Sensing 12 (43%), Intuition 16 (57%); Thinking 9 (32%), Feeling 19 (68%); Judging 23 (82%), Perceiving 5 (19%). Table 2 below illustrates the distribution of the online students' MBTI indicators. It is interesting to note that the predominant preference type for this group of pre-service educators is E (61%) N(57%) F(68%) J(82%) which corresponds to the general preference type of teachers, ENFJ (Myers & McCaulley, 1985).

Table 2: Distribution of Student MBTI Indicators



In order to analyze student perceptions of the online format, the results of the SPOOL questionnaire were categorized based on the collected Likert data (4=strongly agree, 3=agree,

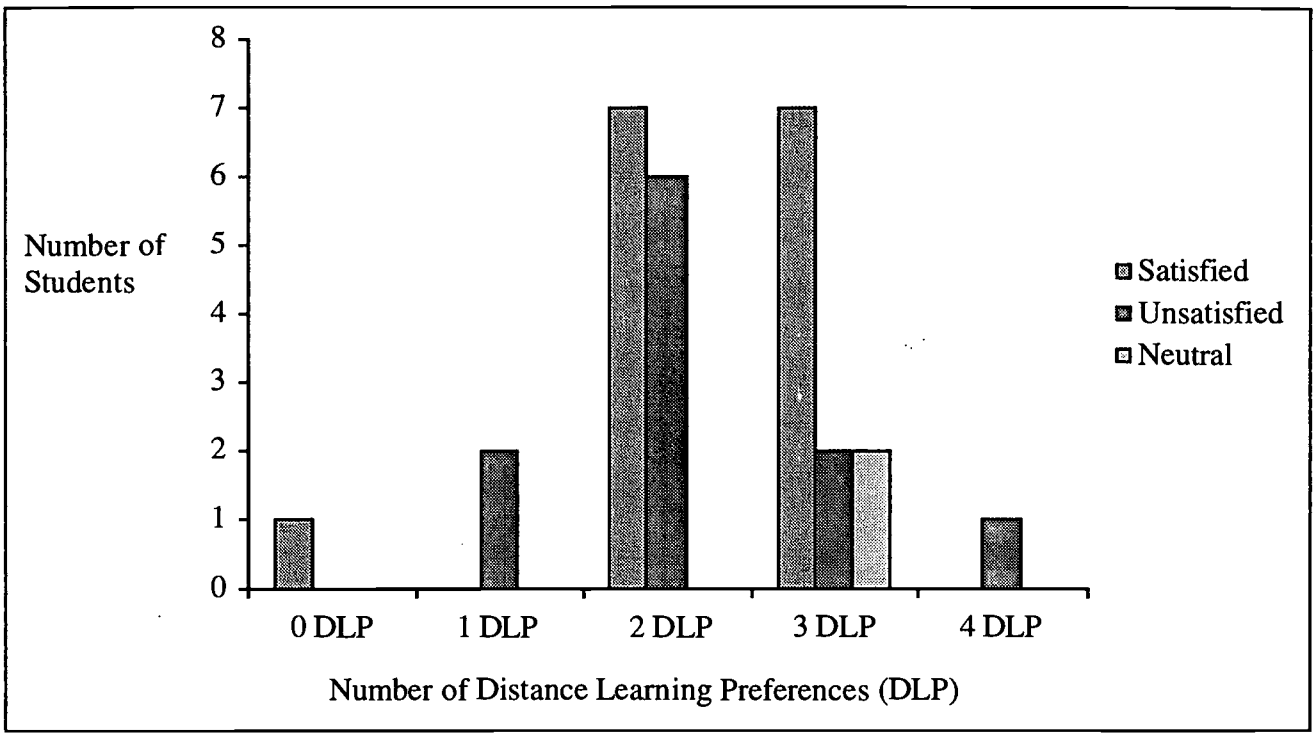
2=disagree 1=strongly disagree). In terms of technical barriers to online learning (Item #1) students generally agreed (3.32) that once they became used to the technology, it was not a barrier to their learning. They strongly agreed (3.54) that assignments were clearly defined (Item #2) and that they had adequate access to the instructor (Item #3) for clarification of tasks (3.56). These results concur with Swan's (2001) research findings that a clearly defined course design and adequate access to the instructor are critical factors for student's achievement in distance learning courses.

With respect to the requirements of the online format, students were in less agreement that email (2.93), and discussion groups (2.79) were effective for learning the assigned material however, they noted that chat assignments were the least effective learning format (2.32). Most students disagreed that they would consider taking an online course in the future (2.49, SD=1.1) and they were generally not convinced that they learned as much from the online sessions as they might have from similar traditional sessions (2.21, SD=1.07).

A satisfaction score was determined by analyzing items related to student's perceived satisfaction with the online learning format (Items # 7,8,9,& 10). To create this index, the total of each students identified advantageous distance learner preferences (0-4) was compared to the total of their item responses for items #7,8,9 & 10 (ranging from 4-16). This allowed the researchers to disaggregate the data and construct a frequency distribution in order to determine individual perceived satisfaction scores. According to this formula, a neutral satisfaction score was determined to be 10, and two students (7%) had this score. Eleven (39%) students scored below 10 and were considered to have perceptions of their online experience as "unsatisfactory". Fifteen (54%) students scored above 10 on this index and were considered to have perceptions of

their online experience as "satisfactory". Table 3 illustrates the perceived satisfaction of students in relation to their advantageous distance learner preferences.

Table 3: Student Satisfaction and Distance Learning Preferences



Several students offered positive comments regarding their online experience. One stated, " I felt that this was a great learning opportunity." Another noted, " I found the online sessions so much more useful and flexible than the face to face sessions. I enjoyed working online and I felt I had a better opportunity to speak freely and share my true opinions instead of worrying about what the whole class might be thinking." And finally, "Upon reflecting: I just had to get used to the technology, other than that I was impressed with this program."

CONCLUSION

It appears that the students in this study generally perceived online instruction to be less effective in terms of their learning, however an analysis of objective measures of concept attainment did not reveal observably different results between two closely matched groups of

online and face-to-face learners. It was also concluded that learning preferences deemed advantageous for successful distance learning had minimal, if any, impact on student achievement, however, these preferences appeared to effect student perceptions regarding their satisfaction with online learning. Satisfaction with the online opportunity was greater for students who indicated at least three of the four learning preferences (extroversion, intuition, thinking and judging), similar to the results reported by Atman (1988).

Is was also evident from student responses that strong feelings existed regarding the online paradigm shift, even with the minimal exposure that was mandatory during this four-session online course supplement of approximately six hours. Technology barriers aside, students seemed to be either intrigued by the opportunity for self-paced, flexible learning or annoyed by the instructor's requirement to participate in a different format for interacting with the course content, the instructor and their classmates. This not so subtle resistance to change has been previously addressed in the distance learning literature as a potential barrier to learning (Felder & Brent, 1996; Woods, 1994). Finally, the researchers submit that this study of online learners served to initiate key questions for further research including 1) rationale for students' self-selection of distance learning course options, 2) personality indicators as a predictive measure of success for online learners, and 3) the importance of recognizing learner preferences in designing online course delivery. As Kenneth Green, the Project Director of the Campus Computing Project, notes. 'The genie will not go back into the bottle; demand for technology will continue, not diminish; the opportunity for distance and online learning will grow, not recede" (1997, J-9). And so must the investigation continue with regard to effective teaching and learning practices for online instructors and their students.

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