

Learning Styles: Which Type of Student is more Successful in which Modality?

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Introduction

Distance education is growing rapidly. The global e-learning market was \$6.5 billion in 2003, increased to \$21 billion by 2008 and is expected to exceed \$52.6 billion by the year 2010 (Kopt, 2007). E-learning can have a positive impact on learning environments. For example, learners can benefit through the discussion of course topics from a multicultural perspective, rather than the limited view that may be present when learners from the same demographic gather in one room. Additionally, learner interaction may change for the better: it is possible that some learners will be more willing to put forward their views in an online course than in a classroom. There may also be a perceived sense of safety and equality in the online world. Learners may not fear asking an unsuitable question because of the increase in perceived anonymity that may be inherent to the online paradigm. This added participation, by those who would otherwise be too timid to speak, can increase confidence and encourage the learning process (Meyer, 2003). Online courses can have negative aspects as well. Learners comfortable with face-to-face classroom learning may have a difficult time adapting themselves and their learning style to the distance learning environment. As distance and e-learning programs have become a more important part of the higher education market (Evans & Haase, 2001; Ngaia, Poonb, Chan, 2007), and as the number of higher education learners are projected to reach close to 20 million by the year 2014 (U.S. Department of Education, 2005), administrators of postsecondary institutes must address the issue of learning styles in this new arena if they are to compete effectively in this market.

The purpose of this study was to determine whether a postsecondary student's learning style is a factor in their success in distance education studies. If it is, school marketers and recruiters can better direct learners to their optimal type of learning environment and increase the likelihood of their success. Many college Web sites currently provide a brief interactive quiz, by which prospective learners can determine whether the distance learning format is suited to their personal learning style. (University of North Carolina, Greensboro, n.d.; READI, 2011). The findings of this research can assist distance education administrators in assessing the validity of the questions in these profile questionnaires, or give the institutions an authenticated set of criteria.

Research Questions and Methodology

The research questions used in this study were:

1. Is there a statistically significant relationship between learning style and learners' success in fully online distance education courses?
2. Is there a statistically significant relationship between learning style and learners' success in blended distance education courses?

This study was designed using a quantitative, comparative, and correlational methodology, investigating the relationship between learners' success and their learning style. Success was operationally defined by learner's satisfaction with the course upon completion, as well as their grade obtained. The methodology for this study included a pilot study and a random sample survey using an online questionnaire survey and a statistical analysis of the results. The grades and satisfaction of learners in online and blended courses were compared to their learning styles and to their success.

Procedures

For this study, the researcher obtained written permission from two large postsecondary schools; DeVry University and the University of Phoenix, to access and survey their learner population and school administrators. To maintain anonymity and learner privacy, the program administrators of one of the participating institutions agreed to send e-mails to learners who had completed at least one distance education course, inviting them to participate in the research. The other institution's administrators posted

a Web link on their e-learning platform directing the learner to an online version of the consent letter. The sampled learners could have been of any age and studying in any discipline. To complete the questionnaire, interested learners were provided a random password, necessary for their one-time access to the survey Web site. Once the subject completed the survey, and a sufficiently large sample size was obtained, the data were analyzed.

The survey, conducted at the Calgary campus of the University of Phoenix and DeVry University, consisted of those students who had enrolled in at least one distance education course during the fall of 2007. In total, 244 students replied to the survey. Of these 244, 124 identified themselves as fully online learners and 120 identified themselves as blended learners. Using the G-Power® software program (Boulet & Boudreault, 1998), the researcher determined that, based on the sample size achieved, power was 0.96 for the fully online learner sample and 0.94 for the blended learning sample (assuming an effect size of 0.6 and an alpha of 0.05).

Two survey instruments were developed by the researcher, one for the distance learning learner and one for the school administrators. The survey questions were developed with the aid and input from two Deans of Academic Affairs, J. Barmby from DeVry University and L. Bowd from the University of Phoenix, who administer programs in both blended learning and complete distance learning models. The survey questions were constructed by the researcher to effectively measure the learning style of students and their rate of success. A learning style questionnaire was part of the survey, the results of which, categorized each student into one of three learning style categories: visual, auditory and kinesthetic/tactile numbered 1 through 3, respectively, with option "4" for those subjects who did not demonstrate a single, dominant learning style. Participants were also asked to provide the numerical grade they achieved in their online course and to indicate their satisfaction level by selecting one of the following: very dissatisfied, dissatisfied, neither satisfied nor dissatisfied, satisfied, very satisfied, or do not have an opinion. These responses were represented using the number 1 (very dissatisfied) to 5 (do not have an opinion). The questionnaires were first distributed by the researcher to a pilot group of postsecondary learners and administrators so that the questions could be validated and so that improvements could be made before distributing it to a larger sample.

The pilot study was conducted at the DeVry University campus in Calgary, Alberta, Canada. To obtain an unbiased sample, the data were gathered using a simple random sampling technique. The purpose of this pilot was to provide valuable information that could be used to improve the questions; therefore, an open-ended item at the end of the questionnaire was used to solicit feedback on the survey. Specific questions were examined by the researcher for variation, meaning, task difficulty, and respondent interest and attention. The entire questionnaire was reviewed by the researcher for the order of questions and timing. In the next stage of the research, the revised survey was distributed by the researcher at the University of Phoenix and DeVry University Online. E-mails inviting subjects to participate in the survey were issued randomly until the desired sample size was achieved. Finally, after the sample size was achieved, the two postsecondary institution administrators were asked by the researcher to participate in a paper-and-pencil survey to obtain completion rates for each course listed in the learner data collected.

Results

Table 1 shows the descriptive statistics for the variables used in this study, displaying the minimum, maximum, mean and standard deviation, for the entire sample.

Table 1 Descriptive Statistics for Sample

Variable	Total e-learners (n = 244)			
	Min.	Max.	M	SD
Interaction evaluation (content)	1.00	5.00	3.86	0.89
Interaction evaluation (context)	1.00	5.00	3.96	1.00
Interaction evaluation (institution)	1.00	5.00	3.79	0.92
Interaction evaluation (instructor)	1.00	5.00	3.69	1.08
Interaction evaluation (learner)	1.00	5.00	3.93	0.90
Learner's learning style	1.00	3.00	1.81	0.95
Learner performance	25.00	100.00	87.66	9.94

Learner satisfaction	1.00	5.00	3.88	1.00
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Table 2 shows the descriptive statistics for the variables used in this study, displaying the minimum, maximum, mean and standard deviation, for fully online learners.

Table 2 Descriptive Statistics for the Fully Online Learner Sample

Variable	Blended Learners (n = 124)			
	Min.	Max.	M	SD
Interaction evaluation (content)	1.00	5.00	3.74	0.90
Interaction evaluation (context)	1.00	5.00	3.91	1.07
Interaction evaluation (institution)	1.00	5.00	3.64	0.82
Interaction evaluation (instructor)	1.00	5.00	3.51	1.10
Interaction evaluation (learner)	1.00	5.00	3.87	0.85
Learner's learning style	1.00	3.00	1.76	0.98
Learner performance	25.00	99.00	86.08	12.59
Learner satisfaction	1.00	5.00	3.83	0.94

Table 3 shows the descriptive statistics for the variables used in this study, displaying the minimum, maximum, mean and standard deviation, for blended learners.

Table 3 Descriptive Statistics for the Blended Learner Sample

Variable	Blended Learners (n = 120)			
	Min.	Max.	M	SD
Interaction evaluation (content)	1.00	5.00	3.99	0.86
Interaction evaluation (context)	1.00	5.00	4.02	0.94
Interaction evaluation (institution)	1.00	5.00	3.94	0.99
Interaction evaluation (instructor)	1.00	5.00	3.88	1.03
Interaction evaluation (learner)	1.00	5.00	4.00	0.95
Learner's learning style	1.00	3.00	1.86	0.93
Learner performance	73.00	100	89.29	5.71
Learner satisfaction	1.00	5.00	3.93	1.06

Table 4 shows the number of courses in the sample, as well as the minimum, maximum, mean and standard deviation of retention in those courses identified from the learners' survey. Four courses were removed from the sample because they were not offered in the year prior to the sample collection and therefore had no historical data.

Table 4 Completion Data

Course Type	n	Min.	Max.	M	SD
Online	20	71.43	97.78	86.22	6.73

Blended	21	61.19	100.00	85.69	10.34
Total	41	61.19	100.00	85.96	8.70

Using a multivariate analysis, when grade and total satisfaction was compared to the use of learning style in a fully online course, $F(4, 121) = 0.949$, $p = 0.390$, Wilks' lambda = 0.985. When grade and total satisfaction was compared to the use of learning style in a blended course, $F(4, 232) = 1.495$, $p = 0.204$, Wilks' lambda = 0.950.

Conclusions

The researcher designed the study to determine whether there was any relationship between the educational success of postsecondary learners enrolled in distance education courses and their learning style. For both the fully online courses and blended learning courses, the results indicated the value of p is higher than 0.05 ($p = 0.390$ for fully online, $p = 0.204$ for blended); therefore, there appeared to be no statistically significant relationship between learning style and learner success in a fully online course.

This researcher also examined how learning styles affect academic outcomes and satisfaction of distance learners and show that learning style is not a factor in learners achieving higher grades or experiencing greater course satisfaction. The sample learners were categorized into three learning styles and there appeared to be no significant difference in outcomes among the learners. Students experienced the same level of academic success and satisfaction, regardless of their learning style. Although auditory learners comprised a small percentage of the sample, there is strong evidence to suggest that these types of learners can also do well in a distance learning course.

Recommendations

While it may be logical to assume that learning style would be a factor in determining learners' distance education success, the results clearly indicated that this is not the case. Although this researcher incorporated data culled from a diverse group of learners with a variety of learning styles, no significant differences in grade or learning satisfaction was noted. Although some types of learners may be hesitant to enrol in a distance learning course, the evidence shows that they can all be successful and should be encouraged to attempt a course in this modality. Learners may be surprised to find that distance education can be an effective and enjoyable learning tool in spite of their personal learning style and reservations. Benson (2005) concluded that this is because learners "have the ability to adapt to whatever learning environment they select, and that learning style may not be the most important consideration when students select a learning environment" (p. 131). Similarity, Neuhauser (2002) found that "learning preference and style has little or no impact on final grades" (p. 111). It is important to note that the results in this researcher's study may be skewed because of the low number of subjects who identified themselves as auditory learners. Over 93% of the respondents were either visual or kinaesthetic learners. This low auditory learner response rate may be due to an inability of distance learning courses to attract auditory learners.

Learning style is an important consideration when studying distance education. The literature in this area provides strong arguments for and against the effects of learning style on outcomes. Aragon, Johnson, and Shaik (2002), Benson (2005), and Zhang (2005) all concluded that learning style does not affect outcomes in distance education courses, while Christensen et al. (2001) claimed that a distance education class must have components to satisfy all learning styles in order to be effective for a wide variety of learners. This researcher examined the significance of learning style by asking respondents to identify their learning style. Their answers were compared to their stated outcomes and it was found, in agreement with other studies, that learning style does not impact learner success. Learners should be aware of their learning style and enrol in courses that help them best learn the content (McClure, 2006), however, this study shows that learners exhibiting all learning styles can function well in distance learning courses.

Distance education learners who answered the survey identified their learning style and provided their outcome and satisfaction level. This would indicate that there is no predictive relationship between a student's learning style and the student's success in distance education courses delivered in either the fully online or blended modality. This conclusion implies that, although some learning styles appear to be better suited for the distance education modality, all students, regardless of their learning technique can benefit from this type of learning. This finding has been corroborated by other researchers. This result was also found by Childress and Overbaugh (2001), whose study showed that there was no significant relationship between learning style and final course grade. Aragon, et al. (2002) also reported that learning style was not a significant factor in learner success. Although the learning style and multiple intelligence theorists state that more technology is needed to satisfy the needs of all types of learners (Christensen, Anakwe, & Kessler, 2001; Krishnasamy, Lee and Sellappan, 2003; Lane, 2000), this researcher found that all learners were able to do well in distance learning courses in spite of the lack of additional technology embedded in some distance learning materials. Administrators of postsecondary institutions who may have thought that some students would not do well in the distance education setting can be assured that all students can do

well in a distance education class. Some learners may require additional support but that can be handled by existing learner support mechanisms.

As learning style does not appear to be a factor in academic success or in learner satisfaction, this researcher's recommendation is that learners of all types of learning styles be encouraged to enrol in distance education courses. Students who have shied away from distance education for fear that their learning style is not conducive to that modality can now enrol in a distance education course without fear of poor performance. Although some of these learners may find it difficult to adapt at the beginning of their first distance education experience, this researcher shows that they will be able to adapt to the materials, regardless of their personal learning style. Although mostly kinaesthetic and visual learners responded to this study, students with a variety of learning styles found success and satisfaction in their distance education courses.

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