

E-Learning and Multiple Learning Styles

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One subject educational researchers can agree on is people have different methods of acquiring information and knowledge. Different theories exist, such as Fleming's VARK model and Kolb's four type definition of learning styles. With E-Learning becoming a more common method of instruction at the college and secondary level, new research is necessary to examine the relationships between how different learning styles affect successfully using E-Learning objects and curriculum. The following is a literature review of several studies that aim to find some answers.

The Zacharis study analyzes a group of students taking the same college course, however some are taking the traditional classroom experience of face-to-face instruction from the teacher, and others are taking the course online. Although previous research has shown that online course are effective, little research is present that analyzes whether the effectiveness is attributed to the learner's learning style. A student's particular learning style may give them an advantage, be it online or in the classroom. Conversely, a student's learning style may be detrimental to the learner if it is not suited for the learning environment.

The study did not use a random sample, as the subjects were able to choose whether they wanted to take the online class or the traditional class. The subjects were given a reliable questionnaire to determine their learning style based on Kolb's theory learning modes. The Kolb model of learning style was developed back in 1984, proposing people learn in 4 different manners; Concrete experience, Reflective observation, Abstract Conceptualism, and Active Experimentation. Learners combine these different learning modes to become different types of learners; Accommodators, Divergers, Assimilators, and Convergers (Zacharis 2010).

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The sample consisted of 161 first year computer science majors. The dependent variable used was their grade after finishing the course. The independent variable was the learning style, determined by the questionnaire taken before the course began. Course selection by the subjects based on their learning style was in agreement with previous research, however A Pearson Chi-Square Test $p = 0.324$ showed that their learning style did not influence their decision on course selection. A 2 x 4 ANOVA test was used to answer the remaining research questions. There was no significance found in student's performance between the online course and traditional face-to-face course ($0.310, p > .05$). The subject's grades were not affected by their course selection ($0.797, p > 0.5$). The study also found no interaction between learning style and instructional method ($0.205, p > 0.5$) (Zacharis 2010).

The researcher's methods used are aligned with a correlational research design. The questionnaire used is a reliable instrument, however the researcher's findings would have been stronger if a different method was used. A random sample of the subjects would have been better than the selection chosen. The design didn't control for internal validity threats such as testing and selection bias. The study is subject to the post hoc fallacy, since there are other variables that could have affected the outcome of the student's grade, regardless of whether they were in the online or traditional class.

In another study, E. Popescu uses adaptive technology WELSA to see the effects of adaptive e-learning among college students. WELSA, or Web based Educational system with Learning Style Adaptation, adapts the course module to fit the specific learning style of the student during the course module. The 64 subjects were given two course modules to partake in. The first module was absent of any incorporation of WELSA. For the second course, the subjects

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were randomly selected to take a WELSA matched course or mismatched course. Afterwards, the subjects took a knowledge assessment and questionnaire on the experience using the course modules. Using a Mann-Whitney U test, the researcher found the WELSA matched subjects experienced more enjoyment, satisfaction, and motivation with little learning effort (Popescu 2010). The mismatched learning style subjects experienced the opposite effects, with more effort put into learning the content. The students preferred how the WELSA modules adapted the order of learning material presented, although they believed even though the module was recommending the path learning material, they still wanted their right to choose how they would interact within the module (Popescu 2010). Satisfaction of using the adaptive module between the learning styles matched and mismatched subjects was measured. Student's satisfaction of using the learning style matched module was significantly higher than the subjects taking the mismatched module (Popescu 2010). In conclusion, the researcher found that using a learner style adaptive module was very beneficial. The study is sound, as the researcher exposes two random sample groups to two different methods of instruction. Using the Mann-Whitney test, the researcher found a significance in overall satisfaction ($p < 0.5$) between the students using the matched and mismatched modules.

In another study, researcher S. Rakap uses Fleming's VARK model of learning style to test for a relationship between learning styles, computer skills, and performance while enrolled in an online course at a southeastern university. The VARK model breaks down styles of knowledge acquisition into four categories; Visual, Aural, Read/Write, and Kinesthetic (Rakap 2010). Instruments used in the study were a background survey, a self-evaluation to examine computer skills, and a VARK questionnaire to identify the learning style of the subjects. Forty six subjects used were enrolled in the same online university course. Using a correlational

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research design, the study used the VARK learning style and computer skill knowledge as the independent variables and the student's success on content quizzes as the dependent variable (Rakap 2010). The study used a one way ANOVA test, a t-test, and a Turkey Post hoc to test for significance amongst the means. The data showed there was a significance between the learner style and the success of the online course between the subjects. Students classified as Read/Write learners scored higher than the other groups, with the Kinesthetic learners scoring the lowest of all the groups (Rakap 2010). There was a correlation between knowledgeable computer skills and course success found using a spearman rank correlation. A t-test did show that there was no significance between the student's prior experience of taking an online course and their success. The study attempts to show online courses catering to the Read/Write group of learners, however the study does have some flaws. The study is not sound because of the lack of a random sample and the design method used. Correlational research is subject to the post hoc fallacy, in which other variables could have interfered with each student's success. More importantly, the dependent variable was quiz scores alone, which is subject to the testing threat of internal validity, as well as other intervening variables such as testing anxiety.

There is a deficiency of knowledge concerning how multiple cognitive learning styles are adapted for educational technology. Two research studies used correlational data to find relationships. They did find significant relationships, but in order to make a sound argument researchers will need to look beyond the college students enrolled in a particular course to find their subjects. By using a true random sample and a control and treatment group, researchers could make a sound case. Certainly the logistics of such a study would be complex and expensive, and trying to control for all the different variables present in multiple learning style

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curriculum would be complicated. Further research is necessary on the subject in order to develop better E-Learning objects.

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Bibliography

Best, J. W., Kahn, J. V., (2006). *Research in Education*, Tenth Edition. Boston: Pearson Education Inc.

Popescu, E., (2010). Adaptation Provisioning With Respect to Learning Styles in a Web-Based Educational System: An Experimental Study. *Journal of Computer Assisted Learning*. 26, 243-257

Rakap, S., (2010). Impacts of Learning Styles and Computer Skills on Adult Students' Learning Online. *The Turkish Online Journal of Educational Technology*. 9(2) 108-115

Zacharis, N. Z., (2010). The Effect of Learning Style on Preference for Web-Based Courses and Learning Outcomes. *British Journal of Educational Technology*. 42(5) 790-800