
Correlates of Learning Behaviors and Performance Outcomes in e-Learning

Ladan Kianmehr
lkianmehr@missouriwestern.edu
Craig School of Business

Ali Kamali
kamali@missouriwestern.edu
Economics, Political Science and Sociology

Missouri Western State University
St. Joseph, MO 64507

Abstract

A good number of studies have focused on factors affecting e-learning and its effectiveness. Whereas these studies compared e-learning with face-to-face traditional classes, we aspire to contribute to the literature by exploring factors that contribute to the student's success. We envisioned that a student's success in e-learning is a function of a series of interrelated learning behaviors. These behaviors were recognized to be: *affective learning*, *devotion*, *self-efficiency*, and *expediency*. The results reflect that paramount among these constructs are "devotion" and "affective learning" experiences. The paper further provides suggestions to improve the areas that seem essential for a successful e-learning environment.

Keywords: e-learning, affective learning, self-efficiency, expediency, performance outcomes.

I. INTRODUCTION

This research aims to 1) add to the body of knowledge of effective e-learning, and 2) magnify e-learning variables and constructs that have been silent in the literature. These objectives are inspired from the assumptions that utilizing computers and information technology (i.e., e-learning) is commonplace in higher education; and, that e-learning is here to stay. Hence, we resorted to a constructivist approach to pedagogy to verify the specificities of e-learning that can help improve content delivery and the relationship between teaching and learning. Conversely, we do not seek to compare e-learning's effectiveness with that of the face-to-face traditional classroom; nor is our intention to support or discredit e-learning as a viable pedagogical tool.

Similar to other newly developed pedagogies, it is natural to suspect e-learning's effectiveness. This suspicion has led to an exorbitant amount of time and efforts invested in researching e-learning, which in turn has led to the generation of diverse opinions and often contradictory findings. However, the preponderance of research on e-learning is mainly justifying e-learning as a legitimate and effective pedagogical strategy vis-à-vis the face-to-face classroom environment.

Managing an e-learning environment can be challenging, difficult, inefficient, passive, and unstructured. The simplicity of most Virtual Learning Environments, as Badge, Cann, and Scott (2005) have observed, has led academic staff to teach themselves the "hows" of the

system, which resulted in poor pedagogical development, ending in the creation of an electronic document repository in place of a viable teaching/learning environment. They have argued that facilitators are not fully utilizing the gamut of potentially useful platforms of the available e-learning tools by trivializing it. This is a dangerous approach to teaching whereby e-learning is devoid of learner-centered activities.

Although advancements in computers and information technologies have greatly contributed to learning in a customized, on demand, and flexible manner, little is empirically known about factors contributing to affective learning (i.e. the learner's willingness to engage and immerse in learning scenarios). Moreover, concerned facilitators want to see an intellectual growth in his/her students, which enables them to generate knowledge independently and develop a deeper intellectual curiosity. Hence, we were curious about the extent to which factors such as self-efficiency—i.e., the extent of maturity and self-discipline or the independence for a self-paced and self-regulated environment)—and expediency—i.e., a conscious effort to stay on top of the course materials—could be effective learning skills in e-learning.

2. LITERATURE REVIEW

Much research is devoted to comparing online and electronic learning with face-to-face traditional teaching/learning modules in higher education. Although e-learning has its own challenges and specificities, the common thread in the literature on effective teaching is that "good teaching is always good teaching" (Driscoll, Jicha, Hunt, Tichavsky, & Thompson, 2012:3). However, the debate over e-learning's effectiveness reflects the suspicion, by conjecture, if *e-learning is [good] learning*"

Availability of diverse means of delivery in a flexible and portable manner is a radical transformation of the modes of information generation and delivery, and is the reasons for e-learning's success. The literature on e-learning's success points to the learner's ability to retain information and his or her abilities to apply the knowledge. Floyd, Harrington, and Santiago (2009) recognized two types of learning: 1) "deep learning" and 2) "surface learning." Borrowing from the literature, they found that perceived course value and student engagement to be two elemental factors for affective instructional conditions that sustain the

student interest in the course. Floyd et al. (2009) further contended that paying attention and being motivated lead to "deep learning." Other researchers (e.g., Conrad 2002; Conrad & Donaldson, 2004; Handelsman, Briggs, Sullivan, & Towler, 2005; Mason, 2011; Richardson & Newby, 2006), who also examined "attention" and "motivation," found them to be contributing to a deeper understanding of the course materials.

Another issue that arises in research on affective learning engagement is the diversity of conceptualization. For example, Bennett, Harper, and Hedberg's (2001) review attests to the multiplicity of interpretations of the term *engagement*, ranging from critical thinking activities and problem-solving to applying the concepts as a knowledge-based skill. Mason (2011) conceptualized *engagement* to mean participation in an online discussion forum; Herrington, Oliver, and Reeves (2003) defined the term to mean connectivity with the course materials. *Engagement* also means checking the course materials daily. Conrad (2009) indicated that learners' level of engagement with a course is dependent on how comfortable they feel with the amount of preparation time and the role of the instructor as facilitator, which in turn indicate the value placed on a course.

A third characteristic of research findings on e-learning's effectiveness is that it predominantly reflects students' perceptions and their acceptance of, or satisfaction with, a course or the pedagogy. A verification of the importance of the skills learned in e-learning has remained silent in the literature. The empirical factors affecting e-learning's success are missing in the preponderance of these studies (e.g., Driscoll et al., 2012; Fu, Su, & Yu, 2009; Sun, Tsai, Finger, Chen, & Yeh, 2008; to name but a few). For example, this is evident from the list of the variables investigated by Sun et al. (2008): *instructor attitude toward e-Learning, perceived e-Learning course flexibility, perceived e-Learning course quality, perceived usefulness, perceived ease of use, and perceived satisfaction*. Another example of subjectivity abundantly appears in research relying on the end of the semester course evaluations. The national debates concerning these evaluations point to the biases embedded in these measures. Clearly, satisfaction with a course does not reflect self-efficiency—i.e., the study skills or the skills for applying the course contents. As Song, Singleton, Hill, and Koh (2003) have indicated,

more research in the areas of e-learning pedagogy is needed; the findings can be employed by educators to enhance learner's educational experiences.

An important element in e-learning valuation is the product quality or course design. Success in a learner's view can be the value that he or she places on a course (Floyd et. al., 2009). *Course value* can be determined based on the challenges the course pose; whether the course contents and management can generate an interest in the learner (Floyd et. al., (2009). *Course value* is also measurable according to the quality of the mechanical framework of a course in terms of its fluidity, robustness of the platform, availability, and other similar mechanical qualities (Sanders & Lafferty, 2010). A solid pedagogical content (i.e., course quality) contributes to a robust e-learning environment, thereby increasing *course value* (Hay, Kehoe, Miquel, Hatzipanagos, Kinchin, et. al., 2008; Stross, 2011).

In summary, we have noticed that a main issue in research on e-learning is conceptualization, which has inadvertently led to the diversity of findings and opinions on e-learning. We also found two other methodological issues that remained silent in the studies reviewed here: 1) a comparative assessment (online versus face-to-face classes) of the effects of a course value and engagement; and 2) the correlation between engagement and course value in creating an interest in the course and deeper learning strategies.

3. THEORETICAL MODEL

Measures of e-learning models have independently, but partially, contributed to our understanding of the critical factors affecting e-learning's effectiveness and its success as an information generation and delivery tool. These measures have focused on different actors such as learners, facilitators, or stakeholders (i.e., the decision making layers such as university officials and Board members). Although a facilitator's role in delivering the course contents is vital in any type of delivery format (Díaz & Blázquez Entonado, 2009), a learner's success also depends on his/her *affective learning engagements* (ALE) with the course, his or her *devotion* (i.e., willingness to immerse in learning scenarios). Based on our literature review, other contributing factors are self-efficiency (i.e., the extent of maturity and self-discipline required in an e-learning environment or the independence

for a self-paced and self-regulated environment) and expediency (i.e., a conscious effort to stay up-to-date). In other words, learners perform better in a course if they are engaged with the course materials on a regular or daily basis. Figure 1 (Appendix B) shows a summary presentation of this model..

4. METHODOLOGY

The data for this study was collected via a self-administered questionnaire, which contained quantitative measures of the constructs explored in this study. The questionnaire measured variables of affective learning engagement, devotion, self-efficiency, self engagement, and learner's success in an e-learning environment. After piloting the questionnaire, we either rephrased or simplified vague or problematic questions.

Sample and Data

The data for this study was collected from a sample of the student population in a small Midwestern university in the Fall, 2012, semester. Classes that met at 10:00 a.m. on Mondays were drawn randomly in order to avoid duplicating respondents. We then located the 11:00 O' Clock sections of the same courses to increase the sample size for reliability. Students enrolled in these classes were targeted as the source of information. A total of 486 respondents constituted the sample for this study (close to 10% of the total student population), which sufficiently ensures consistency in reliability (Monette, Sullivan, & DeJong, 2010). Since our analysis focused on experiences with e-learning, Based on a self-reported question on the questionnaire, we eliminated those from the analysis who had never had any type of e-learning experiences in order to make the sample more relevant. Fifty-two percent of the respondents had never taken any online classes. This closely resembles a University conducted research on the entire student population. Of those surveyed, 77.8% were traditional students—i.e., typically 18-24 years of age who enters the university with no delay from high school, may work part-time, is financially dependent (Deil-Amen, 2011). This ratio closely resembles the University's nontraditional student ratio (approximately 25%). In addition, 62% of the respondents were females. The participants were equally distributed according to their class status—i.e., Freshman, Sophomore, Junior, and Senior.

Research Questions and Hypotheses

This study explored factors affecting academic performance in an e-learning environment. It attempted to verify factors that contribute to the development of *affective learning engagement* (ALE), *devotion* to a course, *self-efficiency* and *expediency*. A latent goal of this study was to verify and recognize a hierarchy of the factors that seem to be more relevant to the student success in an e-learning environment. Hence, we tested the following hypotheses:

1. A successful performance in an e-learning environment depends on the learner's *affective learning engagements* (ALE) with the course, his or her *devotion*, the *efficiency* to complete the course requirements, and *expediency*.
2. *Affective learning engagement* can be reached through *self-efficiency* and *expediency*.
3. *Efficiency* and *expediency* are functions of *devotion* to the course and the subject matters to be studied.
4. *Affective learning* is a function of *devotion* to the course.

Although the aim in this research is not to construct a unified theory of e-learning, the collective assumption in these hypotheses points the importance of a learner-centered environment in e-learning.

Variables and Measures

We created four additive constructs to verify the theoretical framework and to test the hypotheses of this study: 1) *Affective Learning Engagements* or the learner's willingness to engage and immerse in learning scenarios. Variables that measured ALE encompassed experiences of being engaged with the course contents—i.e., the utilization of synchronous and asynchronous modes of communication with the facilitators and/or with classmates particularly while participating in discussions and forums—and the regularity with which one stays up-to-date with the course contents. 2) *Self-efficiency*. This constructs focused on the habitual treatment of a class. The variables of *self-efficiency* assessed independence while completing a course requirement either independently or collaboratively, as well as the ability to follow instructions independently. Other relevant measures of *self-efficiency* (such as the ability to use an application or ease of access to the course materials) were not included in this constructs since all e-learners in this institution

must pass a computer proficiency test before taking an online class. 3) *Devotion*. We defined and measured *devotion* based on time spent to study the course materials, and perceived devotion to an online class as compared to face-to-face traditional classes. 4) *Expediency*. We defined this construct to mean the regularity with which the learner can fulfill the course requirements. Finally, we quantified learner's *performance outcome*—the endogenous variable in this study—as reflecting the learner's success. The simplest measure of *performance outcome* is the learner's Grade Point Average in online and hybrid classes.

All measures in this study employed an ordinal level of measurement. The questions in the questionnaire were measured based a 5-point Likert scale. After creating the constructs, the scales were recoded into three hierarchical categories ranging from "low" to "moderate" to "high." Items in each scale were cross-checked for internal consistency—all were statistically significant at $p < .01$. Variables that did not meet this requirement were eliminated from its respective construct. Because of the ordinal nature of the measures, Spearman's Rho was utilized to obtain bivariate correlations between the constructs in our theoretical model.

Limitations

During developing the theoretical framework presented above, and our initial conceptualization process, we did not envision the relevance of satisfaction with the e-learning environment to the learner's success in e-learning. Additional variables that could measure satisfaction with the nature of the e-learning environment seem significant in verifying the variances in the outcomes. Another missing point in our study is the distinction between the required classes for the majors and the electives, or courses listed as General Studies or Common Curriculum. Further research that incorporates these variables may shed light on issue such as course valuation, relevance, and its relevance.

5. FINDINGS

The first layer of analysis in this study tested the descriptive attributes of the e-learning constructs. Table 1 (Appendix A) contains both percent and mean distributions of the respondents across different e-learning constructs examined in this study.

According to the data in Table 1, the majority of the participants rated their devotion to a course as moderate (71%). A good many (69.3%) viewed their management of the course moderately expedient. The mean scores for these two constructs show similar patterns of distribution of the respondents (2.01 and 2.02, respectively).

The majority of the respondents also perceived their academic behavior in the areas of *efficiency* and *affective learning* as moderate (57.7% and 54.6%, respectively). Those who perceived themselves as highly efficient and affectively engaged with the course seem to be almost twice as many (38.2% and 27.7%, respectively) as compared with highly *devoted* and *expedient* e-learners (15.1% and 16.4%, respectively). The differences are also evident in the mean distribution statistics for *affective learning* (2.10) and *efficiency* (2.34), the latter of which is skewed closer to the "high" end. Moreover, the small Standard Deviation scores point to the uniformity of the responses. This, the frequency distributions, and the mean scores indicate that the respondents, in general, viewed themselves as moderately engaged, devoted, and efficient.

A second layer of analysis in this study included cross checking the correlations between possible pairs of the constructs in our model (See Figure 1, Appendix B). The bivariate coefficients presented in Figure 1 indicate a positive and statistically significant correlation between *devotion* and *performance outcomes* ($r=.20$, $p=.009$), and between *affective learning* and *performance outcomes* ($r=.14$, $p=.04$). Our preliminary bivariate correlation values between possible pairs of *efficiency*, *expediency*, and *performance outcomes* showed almost nonexistent and statistically insignificant correlations among these latter three constructs. Given these findings, Hypothesis 1 is only partially supported. These latter sets of correlations contradict commonsense values such as efficiency and expediency as core values in academic culture. One explanation is the assumption of meeting the deadlines. If a learner can submit quality work even under time constraints, then an efficient time management or expediency may render useless or irrelevant in determining the outcomes. Perhaps future research in this area may shed light on this issue.

This set of analyses also indicated that *efficiency* and *expediency* have no bearing on *affective*

learning. The empirical data does not support Hypothesis 2. Likewise, *devotion* to a course or a subject matter did not show any statistically significant correlation with *efficiency* ($r= -.03$, $p=.62$); nor did we observe any significant correlation between *devotion* and *expediency* ($r= -.13$, $p=.10$). In fact, the correlation between devotion and expediency was inverse, which warrants further investigation of the reasons for the discrepancy between our assumption and the empirical reality. As a result, we rejected Hypothesis 3. However, *affective learning* showed a moderate but statistically significant correlation with *devotion* ($r=.29$, $p<.001$). Thus, the data supported Hypothesis 4. Given the above, we may speculate that efficiency and expediency may be immaterial to producing quality outcomes (test results, assignments, projects, etc.). A good learner is a good learner regardless of the learning environment. This was evident when we cross-checked the overall GPA with the online GPA. We found a strong and statistically significant correlation ($r=.47$, $p<.001$) between their overall GPA and the GPA accumulated in online or hybrid classes.

Although the descriptive statistics in Table 1 (Appendix A) point to a homogenous distribution of the respondents across different constructs of e-learning examined in this study, the observed inconsistent bivariate correlation pattern is a cause for concern; they do not differentiate the role that each construct plays in the overall scheme of the e-learning environment. Since one of our aims in this study is to seek and verify the significance of the e-learning model presented here, we need to determine which constructs in our model are more important or significant in affecting the student performance outcomes in an e-learning environment. Hence, regression analysis was employed as our third level of analysis to examine the efficacy of the constructs (Cohen, 1988). Regression results are presented in Table 2 (See Appendix A).

As is the case with any multivariate analysis, a major concern is the presence of the multicollinearity threat. However, our regression analysis indicated that the tolerance level was $>.90$ for all constructs employed in this study. This indicates that the constructs used in this study are not subjected to the threat of multicollinearity: they are independent of each other.

The F ration in Table 2 verifies that the model examined in this study is significant ($F=27.52$,

$p=.000$). However, the model predicts only a small portion of the variance in e-learning performance outcomes (only 6%). However, test statistics show a greater emphasis on the role that *devotion* to a course plays in predicting *performance outcomes*. *Devotion* seems to be the most important factor in the e-learning equation tested here ($\beta=.20$, $p=.02$). The t score for this construct also supported this finding ($t=2.25$). The t score is greater than 1.96, which means the confidence interval is greater than 95%. Since not all constructs in our model were significant in affecting performance outcomes, we can assume that some unexplained portion of the variance in performance may be due to other factors such as the course structure and its integrity. Thus, there seems to be a need for further research in this area. Nonetheless, the results in the regressions table correspond with the bivariate coefficients.

6. CONCLUSIONS

E-learning has been studied in many ways and forms. Our aim in conducting this study was not to verify or reject e-learning as a competing teaching/learning model. Our intention was to seek constructs that would enhance the learning process in the e-learning environment. Whether e-learning can replace face-to-face traditional classroom format is highly questionable (Zhang et. al., 2004), but the rising tendencies to incorporate information technology in our daily activities lay claim to the idea that e-learning is here to stay. The penetration of consumerism in academia has become a compelling reason for the faculty to accept information technology and e-learning; hence, strategizing delivery methods that incorporate e-learning in ways that fit their needs better.

Regardless of one's approach (a purely e-learning environment, face-to-face instructional models, or blended learning), a critical point in e-learning is the user's experience. E-learning requires a degree of self-paced, disciplined structure; it is not an activity with which everyone can feel comfortable; nor have most students reached a level of competency and self-efficiency that regulates their engagement with the course materials. If employed in this fashion, as Zhang, Zhao, Zhou, and Nunamaker (2004) exclaimed, e-learning can promote learners who could outperform learners in face-to-face traditional learning environments.

In this study, we incorporated and tested constructs that could promote learners who could

outperform those trained in face-to face traditional environment. The constructs tested in this study are also potentially implementable in face-to-face traditional teaching/ learning models. This was intended since we wanted to show idea that the method of delivery does not dictate the contents: effective teaching (or learning) is determined by the environment within which knowledge is generated.

We found that a successful e-learning is a function (or product) of certain structural factors that reflect characteristics of studious learners. Given this, and since many researchers found no significant difference between e-learning and face-to-face traditional classroom, we assumed that devotion and *affective learning engagement*, the two essential constructs in this study, effectively create a successful learning environment if implement in face-to-face traditional classroom.

As we have seen, the literature suggests that effective e-learning is achievable through providing reliable and fluent communication channels and interaction maintenance among learners and between the facilitator and the learner. Our study also revealed that being attentive to the subject positively correlates with learning. We also contend that the potential to enhance learning can be reached by widening the learner's options and permitting independence in learning. This suggestion proposes a rediscovery of the distinction between a "pupil" and a "student." In higher education, learners must seek knowledge independently instead of being "taught to." Perhaps, the former is more appropriate in e-learning, and a reason for ineffectiveness of other constructs but the course structure.

We suggest that e-learning community building can be the foundation for creating and strengthening *affective learning*. Although the literature suggests many diverse variables and methods of community building, those that we examined here as essential constructs (more specifically, devotion and affective learning) seem to manifest themselves better in the notion of *learning teams*. Following the corporate model, some universities (e.g., University of Phoenix) have long been implementing this type of practices. However, our suggestion is more aesthetic, and derives from the academic notion of *learning communities*. Learners are more likely to develop fondness toward the course if

they are engaged with others (i.e., their peers) in the process of generating knowledge.

In summary, learners are stakeholders in the advancement and growth of e-learning. Success in e-learning relates to recognizing and addressing the need of the learners in general. Although the current research concentrated on the learners with e-learning experiences, further need assessment on a majority (52% in this study) that are struggling with the unknown fear of e-learning will shed light on the methods for successful marketing of e-learning. Perhaps, understanding and tackling the sources of the student needs may prevent the high rate of failing grades, withdrawal, or incomplete grades that seem to be characteristically associated with e-learning (Wagner, Hassanein, & Head, 2008).

7. REFERENCES

- Badge, J., Cann, A., & Scott, J. (2005). e-Learning Versus e-Teaching: Seeing the Pedagogic Wood for the Technological Trees. *Bioscience Education*, Volume 5, Beej-5-6.
- Bennett, S., Harper, B., & Hedberg, J. (2001). Designing Real-Life Cases to Support Authentic Design Activities. In G. Kennedy, M. Keppell, C. McNaught, & T. Petrovic (Eds.), *Meeting at the Crossroads. Proceedings of the 18th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education* (pp. 73-81). Melbourne: Biomedical Multimedia Unit, University of Melbourne. <http://www.ascilite.org.au/conferences/melbourne01/pdf/papers/bennetts.pdf>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Science* (2nd ed). Hillsdale, New Jersey: Erlbaum.
- Conrad, D., (2002). Engagement, Excitement, Anxiety, and Fear: Learners' Experience of Starting an Online Course. *The American Journal of Distance Education*, 16(4), 205-226.
- Conrad, R., & Donaldson, J. (2004). *Engaging the Online Learner: Activities and Resources for Creative Instruction*. San Francisco: Jossey-Bass.
- Davies, J., & Graff, M., (2005). Performance in e-Learning: Online Participation and Student Grades. *British Journal of Education Technology*, 36(4), 657-663.
- Deil-Amen, R. (2011). The "Traditional" College Student: A Smaller and Smaller Minority and Its Implications for Diversity and Access Institutions University of Arizona, Center for the Study of Higher Education. Paper prepared for the Mapping Broad Access Higher Education Conference, Stanford University.
- Díaz, A., & Blázquez Entonado, F. (2009). Are the Functions of Teachers in e-Learning and Face-to-Face Learning Environments Really Different? *Educational Technology & Society*, 12 (4), 331-343.
- Driscoll, J, Hunt, K., Tichavsky, A., & Thompson, G. (2012). Can Online Courses Deliver In-class Results? A Comparison of Student Performance and Satisfaction in an Online Versus Face-To-Face Introductory Sociology Course. *Teaching Sociology*, 40(4), 312-331.
- Floyd, S., Harrington, S., and Santiago, J. (2009). The Effect of Engagement and Perceived Course Value on Deep and Surface Learning Strategies. *Informing Science: the International Journal of an Emerging Transdiscipline*, 12, 181-190.
- Fu, F-L., Su, R-C., Yu, S-C. (2009). EGame Flow: A Scale to Measure Learners' Enjoyment of e-Learning Games. *Computers & Education*, 52, 101-112.
- Garrison, D., Kanuka, H., (2004). Blended Learning: Uncovering its Transformative Potential in Higher Education *Internet and Higher Education*, 7, 95-105.
- Handelsman, M., Briggs, W., Sullivan, N., & Towler, A. (2005). A Measure of College Student Course Engagement. *The Journal of Educational Research*, 98(3), 184-192.
- Herrington, J., Oliver, R., & Reeves, T., (2003). Patterns of Engagement in Authentic Online Learning Environments. *Australian Journal of Educational Technology*, 19(1), 59-71.
- Hay, D., Kehoe, C., Miquel, M., Hatzipanagos, S., Kinchin, I., Keevil, S., & Lygo-Baker, S. (2008). *Measuring the Quality of e-Learning*.

- British Journal of Educational Technology, 39(6), 1037-1056.
- Ladyshevsky, R. (2004). E-learning Compared With Face to Face: Differences in the Academic Achievement of Postgraduate Business Students. *Australasian Journal of Educational Technology*, 20(3), 316-336.
- Mason, R. B. (2011). Student Engagement With, and Participation in, an e-Forum. *Educational Technology & Society*, 14 (2), 258-268.
- Monette, D., Sullivan, T., & DeJong, C. (2010). *Applied Social Research: Tools for the Human Services*. 9th edition. New York, NY: Thompson.
- Richardson, J. C., & Newby, T. (2006). The Role of Students' Cognitive Engagement in Online Learning. *The American Journal of Distance Education*, 20(1), 23-37.
- Rovai, A., & Jordan, H., (2004). Blended Learning and Sense of Community: A Comparative Analysis With Traditional and Fully Online Graduate Courses. *The International Review of Research in Open and Distance Learning* (e-Journal: <http://www.irrodl.org>), ISSN: 1492-3831. Retrieved: 5/27/203.
- Sanders, J. & Lafferty, N. (2010). Twelve Tips on Usability Testing to Develop Effective e-Learning in Medical Education. *Medical Teacher*, 32, 956-960.
- Singh, H., (2003). Building Effective Blended Learning Programs. *Educational Technology*, 43(6), 51-54.
- Song, L., Singleton, E., Hill, J., Koh, M-H. (2004). Improving Online Learning: Student Perceptions of Useful and Challenging Characteristics. *Internet and Higher Education*, 7, 59-70
- Stross, R. (2011). In *Breaking Down Walls, Does Online Education Sacrifice Quality?* Open Education: <http://www.openeducation.net/2011/02/10/in-breaking-down-walls-does-online-education-sacrifice-quality>. Retrieved April 2013.
- Sun, P-C., Tsai, R., Finger, G., Chen, Y-Y., Yeh, D. (2008). What Drives a Successful e-Learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction. *Computers & Education*, 50, 1183-1202
- Wagner, N., Hassanein, K., & Head, M. (2008). Who is Responsible for E-Learning Success in Higher Education? A Stakeholders' Analysis. *Educational Technology & Society*, 11(3), 26-36.
- Wonacott, M., (2002). *Blending Face-to-Face and Distance Learning Methods in Adult and Career-Technical Education*. ERIC (Educational Resources Information Center): Clearinghouse on Adult, Career, and Vocational Education. Paper No. 23.
- Zhang, D., Zhao, J., Zhou, L., & Nunamaker, J. (2004). Can e-Learning Replace Classroom Learning? *Communication of the ACM*, 47(5), 75-79.

APPENDIX A

Table 1. Descriptive Statistics: Percent Distribution of Respondents, Mean, and Standard Deviation

| Constructs | Low | Moderate | High | Total | Median | SD |
|--------------------|-------|----------|-------|-------|--------|-----|
| Devotion | 13.8% | 71.1% | 15.1% | 100% | 2.01 | .54 |
| Expediency | 14.3% | 69.3% | 16.4% | 100% | 2.02 | .55 |
| Efficiency | 4.1% | 57.7% | 38.2% | 100% | 2.34 | .56 |
| Affective Learning | 17.6% | 54.6% | 27.7% | 100% | 2.10 | .67 |

Table 2. Regression Coefficients for Construct Measurements ^a

| Constructs | B | SE | β | t | Sig. |
|---------------------------|------|-----|---------|-------|------|
| (Constant) | 2.20 | .69 | | 3.204 | .002 |
| Devotion | .43 | .19 | .20 | 2.25 | .02 |
| Efficiency | .24 | .16 | .12 | 1.494 | .14 |
| Expediency | .01 | .17 | .01 | 0.016 | .99 |
| Affective Learning | .15 | .15 | .08 | 1.02 | .39 |

R = .25 R² = .06 Adjusted R² = .03 F = 2.65 Sig. = .03

a. Dependent Variable = Performance

APPENDIX B

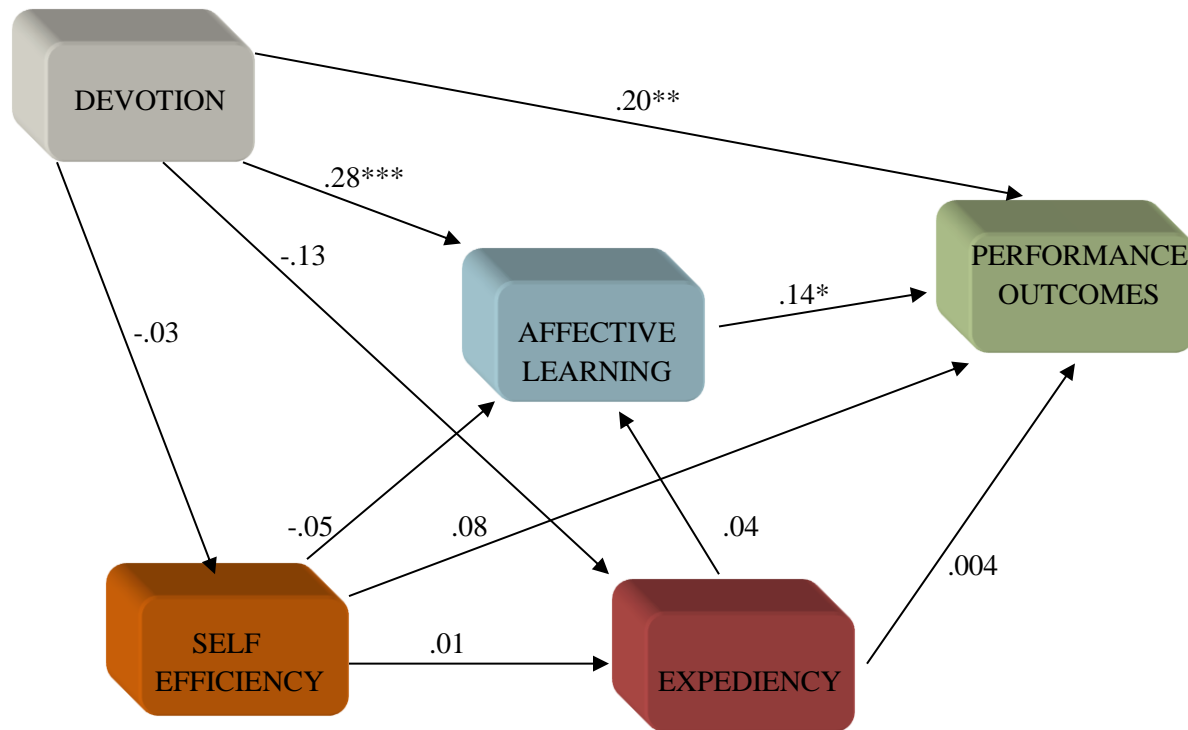


Figure 1. Theoretical Model and the Bivariate Spearman Rho Correlation Coefficients

- *** Correlation is significant at $p < 0.001$ level (2-tailed)
- ** Correlation is significant at $p < 0.01$ level (2-tailed)
- * Correlation is significant at $p < 0.05$ level (2-tailed)