1-2010

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Journal of
INDUSTRIAL
TECHNOLOGY

Volume 26, Number 1 - January 2010 through March 2010

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Peer-Refereed
Pedagogical Papers

KEYWORD SEARCH

Distance Learning
Higher Education
Research
Teaching Methods

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Abstract

As more online graduate programs are created and traditional programs shift to an online format, the need to identify and understand skill sets necessary for students' success becomes more apparent. Typically, graduate programs rely on entrance requirements such as the GRE, undergraduate GPA, and a writing sample to evaluate an applicant's potential success. Is it reasonable to expect that other entrance requirements might be needed for student success in online graduate degree programs?

Research comparing learning and personality styles of online learners exists; however, application of this information as part of the admissions process for online graduate programs is sporadic. How important is the identification and understanding of the skill sets necessary for success of the online learners? Should the entrance requirements be different for online graduate programs; and if so, what should be included?

Students currently enrolled in an online masters program were measured for personality and learning styles. The survey results were compared with data from previously published research. A survey of the Engineering Technology Listserve also gathered data from online programs to identify entrance requirements and perceptions of faculty regarding learning styles.

Introduction

Predicting the skill sets necessary for student success becomes more complex as universities develop online graduate programs and add online components to their traditional programs. Traditionally, graduate programs rely on entrance requirements such as a Graduate Record Examination (GRE) score, an undergraduate grade point average (GPA), and a writing sample to evaluate an applicant's potential success in the program. Much of the literature supports the use of traditional methods for predicting student success in graduate programs. Is it reasonable to speculate that these same entrance requirements can predict success in a graduate degree program that is delivered online? Should the entrance requirements be different for online programs, and if so, how? Where do personalities and learning style preferences fit into this puzzle?

After a review of literature related to entrance requirements and learning style inventories, this paper will explore the usefulness of such inventories as entrance criteria for online learning, particularly in technical management master's programs. Two surveys were conducted to seek answers to the questions raised above. One survey measured students currently enrolled in online master's courses for personality and learning styles. The second survey asked members of an Engineering Technology Listserve several questions related to entrance requirements for online master's programs.

Overview Of Online Technical Management Master's Degree Requirements

To assess the current entrance requirements for technical managerial master's degree programs, 16 online degree programs were randomly selected using the Web portal Gradschools.com. Table 1 shows the institutions, degree programs, and their respective entrance requirements. Of the selected programs, most do not require completion of a standardized test. Two of the remaining programs require it only for assis-

tantships or non-U.S. baccalaureate degrees. One of the selected programs will waive the standardized test requirement with demonstrated leadership or professional experience. The remaining programs require a GRE or Graduate Management Admissions Test (GMAT) minimum score or a combination of GPA combined with a standard test score.

Most of the selected technical managerial programs accept any type of baccalaureate degree, but require a minimum baccalaureate GPA and letters of reference or recommendation. The submission of a statement of purpose or some type of written essay is popular with almost half of the selected programs. A few of the sampled programs require a resume or curriculum vitae.

Table 1. Entrance requirements for sixteen randomly selected technical/managerial online master's degree programs

College/University	Online Master's Programs	GRE or	GPA	Writing	Bachelor's	Ref.	CV
		GMAT		Statement/Essay	Degree	Letters	Resume
Kettering University	Mfg. Operations		3.00		Any	√	
Kettering University	Mfg. Management		3.00		Any		
Central Michigan University	Masters in Admin.	√†	2.70	√	Any		
Bellevue University	Acquisition & Contract Mgmt.		2.50		Any		
University of Central Missouri	Industrial Mgmt.		2.60	√	Any	√	√
Illinois Institute of Technology	Industrial Tech. & Ops.	√‡	3.00	√	Any	√	
Southern Methodist University	Mfg. Systems Mgmt.		3.00	√	BS	√	
Texas A&M University	Industrial Distribution	√	3.00	√	Any	√	√
East Carolina University	Mfg. Systems	√	2.50		Any	√	√
Wildau Institute of Technology	Aviation Mgmt.			√	Any	√	√
Marist University	Technology Mgmt.	√♯	3.00		Prefer BS	√	
New England College	Project Mgmt.		3.00	√	Any	√	√
University of Bridgeport	Technology Mgmt.		2.80		BS	√	
Bemidji State University	Industrial Tech.		2.75		Prefer BS	√	
Western Kentucky University	Technology Mgmt.	√	2200*		Any		
Southern New Hampshire University	Operations & Project Mgmt.		3.00		Any		√

All programs require the TOEFL for International Students
* - Requires a minimum GAP score (GPA x GRE)
† - Required for assistantships only
‡ - Required for non-US BS degrees
♯ - may be waived if five years of post-baccalaureate leadership experience or eight years of post-baccalaureate professional experience or a graduate degree.

Thus, entrance requirements for online technical management master's programs appear to vary widely among the sampled programs and the use of standardized tests as an indicator of an applicant's potential success in online graduate programs may be losing favor. The use of undergraduate GPA appears to be the strongest and most consistent entrance requirement across the selected programs. However, these findings cannot be generalized across a broader range of programs without further study and verification.

Entrance Requirements As Predictors Of Success

In a study of seven graduate institutions, including 21 various departments, Burton and Wang (2005) concluded that "Key professional skills of graduate students, including their mastery of the discipline, their potential for professional productivity, and their ability to communicate what they know are predicted strongly by GRE scores and undergraduate grade point average" (p. 38). On the other hand, while assessing the validity of GREs as predictors of the success of graduate students in psychology programs at Cornell and Yale, Williams and Sternberg found that when the results were separated out by (1) categories of the GRE and (2) gender, only the analytical scores of males seemed to predict student performance (1997). Based on these results, Williams and Sternberg suggest, ". . . the need for serious validation studies of the GRE, not to mention other admissions indexes, against measures of consequential performances . . . " (p. 640).

Dreher and Ryan (2002) warn that "those responsible for admissions decisions should empirically evaluate proposed selection criteria" before bowing to pressures to change admissions criteria. Their fear is that selection requirements, such as work experience, may "create artificial barriers to graduate education" (p. 739).

Readiness For Online Master's Programs

During the review of literature and visits to graduate program websites, it was noted that while some programs suggest completion of a learning style inventory as part of the application process, very few require it. New England College sponsors The eLearners™ Advisor, a free online questionnaire designed to help prospective students of online degree programs determine their readiness for online learning. This assessment is not tied to a particular institution; rather, it is part of a clearinghouse site that guides prospective students to online degree programs. The survey is based on four factors: (1) technology access, (2) technical skills, (3) personal factors (such as motivation and scheduling issues), and (3) learning styles. Prospective online students who complete the inventory are provided with an "overall compatibility factor" to help them self-select the areas they may need to work on before attempting an online program (DeSantis, n.d.). More about The eLearners™ Advisor can be found at the following URL: http://www.elearners.com/advisor/about_ela.asp.

Parnell and Carraher (2003) considered four attitudinal dimensions in the development of their 12-item Management Education by Internet Readiness (MEBIR) Scale, which they validated as a tool to assess personal readiness for Internet course work: (1) Technological Mastery (TECH), (2) Flexibility of course delivery (FLEX), (3) Anticipated quality of the course (QUAL), and (4) Self-management orientation (SELF). One important question arose from their study:

> *. . . although addressing and assessing individual characteristics may be important for improving Internet educational experiences, how can providers of management education via the Internet target learners with the proper combination of individual characteristics? (p. 12)*

While some institutions recommend completion of online readiness surveys, Western Governors University requires prospective online masters students to pass a 40-question readiness exam designed to determine "the students' preparation for independent learning (such as writing ability)" (Littlefield, 2008, para. 4). This exam is in addition to their general graduate admissions requirements.

Overview Of Learning Style Inventories

If everyone learned in the same manner, education would be a simple process, but a teaching method that works for one student may not work as well, or at all, for another student. Over the years, educators and psychologists have studied this phenomenon in an effort to understand the differences in learning styles. These studies have resulted in a multitude of instruments that attempt to categorize learning into well-defined areas.

Without an understanding of learning styles, a teacher might assume that some students have the ability and desire to learn, while others do not. Sternberg and Zhang (2001) suggest that, while ability is certainly a factor in learning, "thinking, learning, and cognitive styles" relate more to student preferences and play an important role (p. vii). Without an understanding of learning styles, a teacher may use the teaching methods that align with his/her preferred learning style; which may not match the preferences of many students. Griggs (1991) recommends that counselors and advisors collaborate with classroom teachers to (1) understand the various learning styles of both students and teachers, and (2) develop a variety of interventions to address different learning preferences.

Ally (2004) defines learning styles as, "a measure of individual differences" that help us understand "how a learner perceives, interacts with, and responds to the learning environment" (p. 14). Ally describes two popular inventories used to help students determine their preferred styles, (1) the Kolb Learning Style Inventory (LSI), that "looks at how learners perceive and process information" and (2) the Myers-Briggs Type Indicator that "uses dichotomous scales to measure extroversion versus introversion, sensing versus intuition, thinking versus feeling, and judging versus perception" (p. 14).

The Personal Preferences Self-Descriptive Questionnaire (PPSDQ) is an example of a validated instrument "developed to measure personal preferences as regards Jungian psychological types" (Thompson & Arnau, 1998). In fact, during the examination of learning style inventory literature, it soon becomes apparent that many such inventories are based on Carl Jung's early theories of personality type (Keefe & Ferrell, 1990; Richter, 1992; Salter, 2006; Wilson, 1998).

Felder (1996) recommends that teachers of engineering design instruction use any of four learning style models to address a variety of learning styles: Myers-Briggs Type Indicator, Kolb's Learning Style Model, Hermann Brain Dominance Instrument, and the Felder-Silverman Learning Style Model. Felder and Spurlin (2005) warn against using learning style inventories to predict behavior or "dictate their course or curricular choices" (p. 111). Instead, they suggest, "Learning style profiles suggest behavior tendencies" (p. 104), which might be used to "help instructors achieve balanced course instruction and to help students understand their learning strengths and areas for improvement" (p.111).

Felder has collaborated extensively with colleagues to develop the Index of Learning Styles (ILS), a 44-question inventory designed to determine where resulting scores fall in relation to four dimensions. The dimensions were developed from a combination of those learning style models previously mentioned: (1) sensing or intuitive, (2) visual or verbal, (3) active or reflective, and (4) sequential or global (Felder and Spurlin, 2005).

Use Of Learning Styles To Determine Readiness For Online Learning

Master's degree programs utilize a variety of entrance requirements to determine student readiness. Most involve standard graduate school applications, test results (GRE, GMAT, LSAT), college transcripts, etc. The standard tests are geared toward mathematical, verbal, and analytical reasoning (Hobsons GradView, 2008). Online graduate programs may also request prospective students take "online readiness" surveys, which generally focus on computer literacy and time management, while some include learning style components as well (DeSantis, n.d; Littlefield, 2008; Parnell & Carraher, 2003; Whisler, 2005).

Whisler (2005) recommends that students considering online courses should assess their "self-efficacy, learning styles, and time management skills to see how suited they are for the fast-paced, text-based online environment" (p. 153). According to Rafe and Manley (1997), "mismatches in student learning style and instructional strategies have been found to affect students' perceptions of programs quality and ultimately their completion of distance education programs" (p. 1). After administering a survey to 74 graduate students in 19 courses utilizing videoconference technology, Rafe and Manley determined that instructional activities designed to be sensitive to different learning styles "should certainly enhance the efficacy of the experiential learning cycle and educational programs employing it" (1997, p. 5).

Diaz and Cartnal (1999) learned from their comparison of community college online and traditional students that online students demonstrated more independent learning styles. They compared students' learning styles by administering the Grasha-Riechmann Student Learning Style Scale, a six-category inventory of social learning preferences. Their study led them to postulate, "faculty may want to employ learning style inventories, as well as collect relevant demographic data, to better prepare for distance classes and to adapt their teaching methods to the preferences of the learners" (para 32).

Terrell and Dringus (1999), who studied the effects of learning styles on the graduation rates of 98 master's degree students in an information science online program, based their hypothesis on Kolb's learning theory that divides learning strategies into four areas: Concrete Experience, Abstract Conceptualization, Reflective Observation, and Active Experimentation. Where a learner's Learning Style Index (LSI) scores fall in relation to these four areas determines which of four learning styles (Converger, Assimilator, Accommodator, or Diverger) the learner prefers (Terrell, 2005). Terrell and Dringus (1999) hypothesized:

> *. . . students in the research group would predominantly fall into the Converger and Assimilator categories since Kolb indicates that persons in technological fields generally are Convergers while teachers fall primarily into the Assimilator category. It was further hypothesized that, due to the needs for divergent thinking and processing demanded by the non-traditional educational model, these same students would graduate in larger numbers than students fitting the Accommodator and Diverger categories (p. 234).*

As predicted, when the students actually completed the LSI, 74.5 percent fell into the Converger or Assimilator categories, and students in those two categories graduated at a higher rate than students in the Accommodator category, but not than students in the Diverger category. Based on this study, Terrell and Dringus concluded:

> *This indicates that institutions offering distance-education programs that are Internet-based should be aware of different learning styles and be prepared to address learning style issues when developing and utilizing and marketing such programs (p. 237).*

In a study of online doctoral students, Terrell (2005) concluded that learning styles had no affect on attrition rates; however, in his study, "no consideration was given to the possibility that a given student's learning preferences may change over time in order to compensate and adapt to an online learning environment" (para 26).

Methods

To compare and contrast student and instructor responses, two surveys were

administered as part of this study. Students currently enrolled in an online masters program were measured for personality and learning styles. While it is possible that personality and learning styles could affect students in face-to-face and hybrid graduate programs, this study was limited to online students. The second survey questioned members of an Engineering Technology Listserve regarding their perceptions related to online master's entrance requirements and learning styles. To remain within the scope of the study, questions on the second survey were limited to perceptions about online master's programs, rather than all master's programs.

Online Student Learning Style Inventory

Online master's students from Western Kentucky University and Valdosta State University were asked to complete an online version of the Index of Learning Styles (ILS) as developed by Felder and Silverman (1988). The ILS instrument was selected (1) because of its ability to measure both learning styles and personality, (2) previous instrument validation, (3) online availability, and most importantly, (4) the cost (it was free). The surveys were administered during the spring and summer sessions of 2008. Students were all enrolled in online courses at the graduate level, and their participation was voluntary and confidential. Of the 53 students offered the survey, 42 responded for a response rate of 79%.

The ILS measures learning styles and strategies along four dimensions. The first is the active/reflective dimension as described by Kolb (1984) where learners internalize information through active experimentation or reflective observation. Active learners prefer learning through activities, tasks, or applications whereas reflective learners prefer time to contemplate, reflect, or ponder the implications of the material. The second ILS dimension is that of sequential/global, which is a variation of the sequential/random dimension used in the Gregorc (1982) model. Sequential learners tend to use linear steps ordered logically whereas global learners tend to use cognitive leaps or by putting information together in novel ways. The third dimension is visual/verbal as described using the Herrmann Brain Dominance Model (1990) or the familiar learning modalities of visual, auditory, and kinesthetic. Visual learners prefer pictures, diagrams, or any visual representation of material whereas verbal learners prefer written or spoken media. Finally, the ILS measures a sensing/intuitive dimension much like the Myer-Briggs Type Indicator (1995). Sensing learners tend to be concrete, practical, and oriented toward facts whereas intuitive learners tend to be conceptual, innovative, and oriented towards theories.

Engineering Technology Listserve Survey

A nine-question survey was developed by the researchers to gather perceptions about entrance requirements for online graduate programs and the inclusion of a learning style inventory in those requirements. To establish validity, graduate faculty who teach on-line classes at both institutions were consulted about the content and format of the survey instrument before it was submitted to and approved by the Institutional Review Boards. Electronic distribution of the survey was chosen to minimize both cost and time. The Engineering Technology Listserve is sponsored by Texas A & M Engineering, and many of its members teach in programs similar to the degree programs of interest. The Engineering Technology Listserve consists of over 3,700 members at over 800 institutions in 30 countries and all 50 of the states in the United States; including almost 2700 members at 332 four-year institutions (Buchanan, 2006).

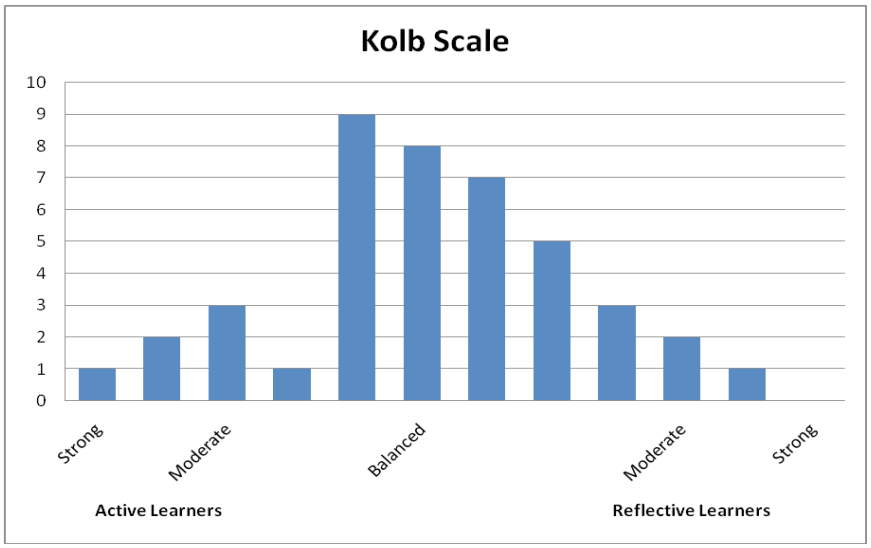
Three e-mails were sent to the Listserve with the first announcing the survey and the second and third as follow-up with one month intervals. Three rounds were chosen as there is typically a considerable descending rate of return with more than two reminders; in addition many recipients become annoyed with the repeated messages. All three e-mails included a link to the anonymous survey administered through the Free Assessment Summary Tool (FAST) website (Ravelli & Patz, 2004).

Findings

Online Student Learning Style Inventory Results

The majority of the student participants surveyed were balanced in their preference between active and reflective learning. They tended to fall in between the two extremes as shown in the Kolb Scale on Figure 1. The majority of the survey participants were also balanced in their preference between sequential and global learning. However, the dispersion as shown on the Gregorc Scale in Figure 2 appears to be greater from

Figure 1. Graduate student learning preferences using Kolb



the center of balance. Thus, these students have a wider range of preference.

Conversely, in Figure 3 the majority of survey participants expressed a strong tendency towards visual learning on the Learning Modality Scale, with the remainder balanced or having a moderate preference for verbal modes. In Figure 4 representing sensing/intuitive, a majority of participants expressed a strong to moderate preference for sensing styles. Only a few participants indicated any preference for intuitive modes.

Engineering Technology Listserve Survey Results

Twenty-six out of 53 (1/2) of the respondents indicated their institution offered a 100% online master's degree program. At first glance, a response rate of 53 out of 332 four-year institutions is a minimal response rate; however, at 16 percent, it is a rate higher than most return rates for mailed surveys. To project results for a larger return rate or a replication of the survey would be speculation and not add to the reliability or validity of the study. A positive is that the responses came from institutions scattered across the country, thus contributing to the ability to generalize the results. Seventeen of 53 (1/3) reported that their program requires successful completion of a special preparation process before allowing students into online classes.

To the statement "An online MS degree program should require successful completion of a preparation process before allowing participants to register for classes," 37 of 53 (70%) agreed or strongly agreed with the idea. Two were neutral and 14 of 53 disagreed or strongly disagreed. Forty (75%) of the respondents agreed or strongly agreed with the concept of requiring graduate school applicants "to assess their online readiness before being admitted to an online graduate program."

The suggestion that "Learning styles should be considered as part of the entrance requirements" generated divergent views. Ten individuals were

Figure 2. Graduate student learning preferences using Gregorc

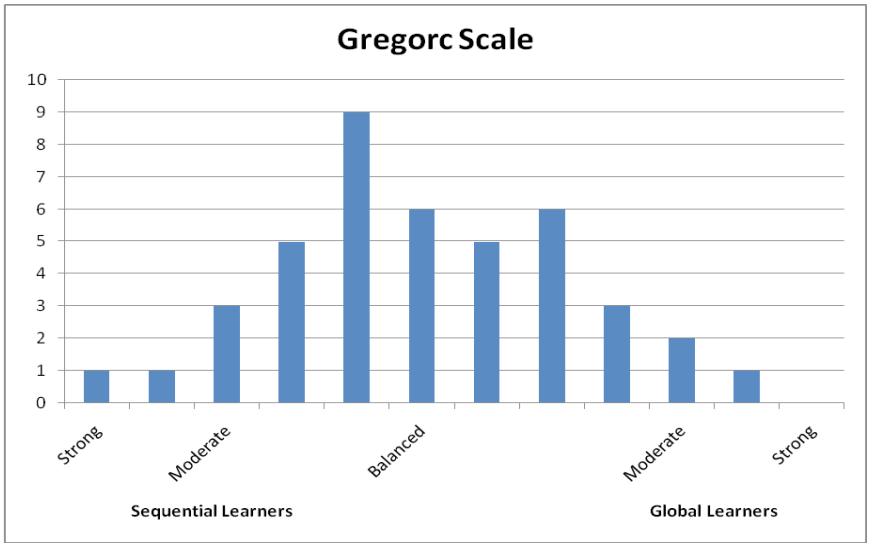


Figure 3. Graduate student learning modality preferences

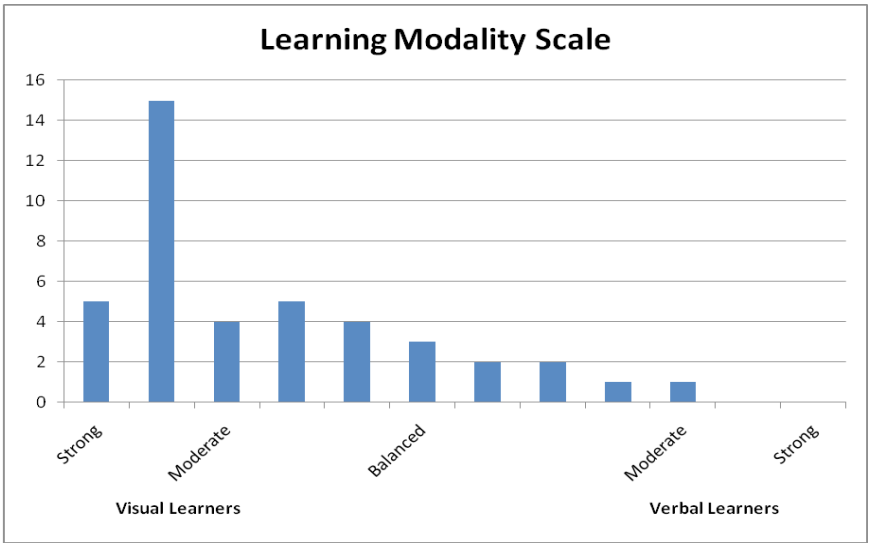
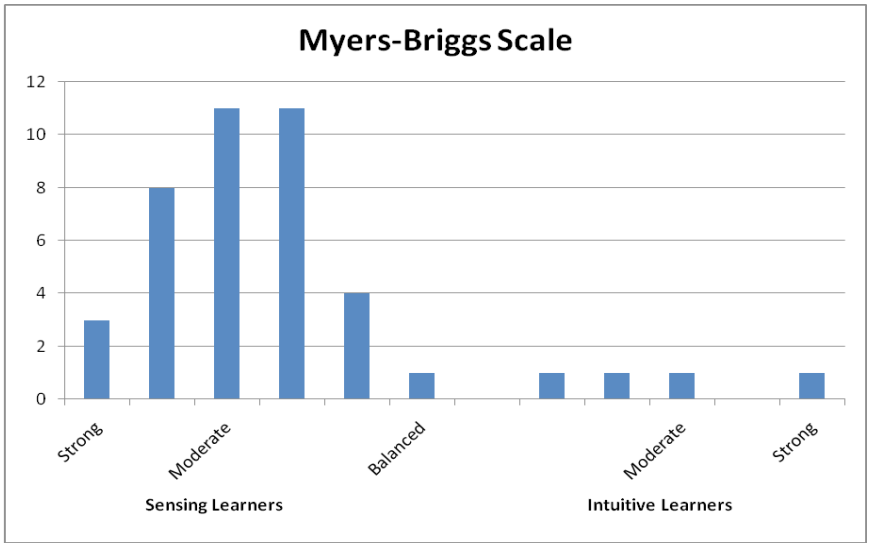


Figure 4. Graduate student learning preferences using Myers-Briggs



neutral, but 43 individuals were split. Twenty (47%) disagreed or strongly disagreed and 23 (53%) agreed or strongly agreed with the notion. Thirty-one (58%) agreed or strongly agreed that "Courses should be developed with regard to predominate learning styles of online students." Eighteen (34%) disagreed or strongly disagreed and four (7-1/2%) were neutral.

Thirty-one out of 53 (58%) respondents disagreed or strongly disagreed with the concept of students receiving "individualized program counseling based upon their personality type. Five (9%) were neutral to the idea and 17 of 53 (1/3) agreed or strongly agreed with the suggestion.

Integrating network, hardware, and software requirements into the program admission criteria drew agreement and strong agreement by 39 (74%) of the survey participants. Five (9%) were neutral and nine (17%) disagreed with the requirement. None of the survey contributors indicated strong disagreement with the idea. Requiring computer literacy as part of program admission received the highest favorable response with 43 (81%) of the respondents agreeing or strongly agreeing with the concept. One person was neutral and nine (17%) disagreed. No one voiced a strong disagreement with the proposal.

The three ideas that garnered the highest support in descending order were 1) evidence of computer literacy as part of program admission; 2) including network, hardware, and software requirements as part of admission; and 3) requiring successful completion of a preparation process prior to beginning classes. It is interesting to note none of these ideas are related to learning styles, but would be more appropriately labeled computer literacy and/or access.

Conclusions And Recommendations For Future Research

While the use of learning style inventories to understand the different ways students react to instruction is well-documented, there is little evidence that such instruments are utilized as entrance criteria for either traditional or online graduate programs. Participants of the Engineering Technology Listserve survey agreed that computer literacy should be assessed as an entrance requirement, but they were split on their agreement that learning styles should also be assessed. Given the split, it is not possible to draw any reasonable conclusion other than considerable disagreement about the use of learning styles as a potential entrance requirement.

The results of the student survey seem to reinforce the findings by Diaz and Carnal (1999) and Terrell and Dringus (1999) that online students demonstrate more independent learning styles. Students in an online program must be more resourceful because they do not have immediate access to instructional and technical resources and are called upon to make decisions without instant corroboration; hence, learning style inventories may be of value for measuring this attribute and predicting success in such an environment.

Because most students entering online graduate programs are not screened for learning styles, the responsibility for understanding how students learn resides with the faculty who are teaching online courses. With regard to online course design and learning styles, it would appear that instructors have certain degrees of flexibility for how they organize course material sequence and activities. Knowing the learning styles of their students may help with these design decisions, so instructors may want to include a learning style inventory as part of the orientation and introduction to their online courses.

The online students studied would probably be able to adapt to both linear and novel approaches to course topics, based on their learning style inventory results. These students would also probably respond favorably to either active experimentation or reflective exercises. In this regard, the study supports the assertion by Terrell (2005) that students adapt and compensate for the online learning environment. This study also suggests that online instructors may want to evaluate the amount of visual content provided in their courses for visual learners and incorporate a degree of factual, practical applications or examples for sensing learners.

Obviously, a corroborating study using the same instrument with a similar group of students would provide additional validation for generalizing the findings to a larger population. Students could be surveyed at the beginning of an online graduate program and again at the end to determine if learning styles changed to accommodate the online environment. The same pre and post surveys could be administered to students in traditional face-to-face graduate programs as a comparison.

References

Allen, I. E., and Seaman, J. (2006). Making the grade: Online education in the United States, 2006. Retrieved May 13, 2008, from http://www.sloan-c.org/publications/survey/pdf/making_the_grade.pdf.

Ally, M. (2004). Foundations of educational theory for online learning. Theory and Practice of Online Learning. Anderson, T. and Elloumi, F. (Eds). pp. 3-31. Athabasca University, Athabasca, AB, T9S 3A3, Canada. Retrieved May 20, 2008 from http://epe.lac-bac.gc.ca/100/200/300/athabasca_univ/theory_and_practice/ch1.html.

Buchanan, W. W. (2006). Engineering Technology ListServ. Engineering Technology and Industrial Distribution: Texas A & M Engineering. Retrieved June 16, 2008, from http://etidweb.tamu.edu/listserv.php.

Burton, N. W. and Wang, M. (2005). Predicting long-term success in graduate school: A collaborative validity study. GRE Board Report No. 99-14R. Retrieved November 18, 2008 from http://www.ets.org/Media/Research/pdf/RR-05-03.pdf.

DeSantis, C. J. (n.d.). About the eLearners™ Advisor. Retrieved May 19, 2008, from http://www.elearners.com/advisor/about_ela.asp.

Diaz, D. P., and Cartnal, R. B. (1999). Comparing students learning styles

in an online distance learning class and an equivalent on-campus class. College Teaching, 47. Retrieved May 16, 2008, from http://home.earthlink.net/~davidpdiaz/LTS/html_docs/grslss.htm.

Dreher, G. F. and Ryan, K. C. (2002). Evaluating MPA-program admissions criteria: The relationship between pre-MBA work experience and post-MBA career outcomes. Research in Higher Education, 43(6), 727-744.

Felder, R. (December, 1996). Matters of style. ASEE Prism, 6, Retrieved May 13, 2008, from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/LS-Prism.htm.

Felder, R. M., & Silverman, L. K. (1988). Learning Styles and Teaching Styles in Engineering Education. Engineering Education, 78 (7), 674-681.

Felder, R. M., and Spurlin, J. (2005). Applications, reliability, and the validity of the index of learning styles. Int. J. Engng., 21, pp. 103-112. Retrieved May 17, 2008, from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/ILS_Validation(IJEE).pdf

Gradschools.com (n.d.). Graduate schools and graduate degrees guide. Retrieved November 16, 2008, from http://www.gradschools.com/

Gregorc, A. F. (1982). Gregorc Style Delineator Research Edition. Maynard, MA: Gabriel Systems.

Griggs, S. A. (1991). Learning styles counseling. ERIC Digest. Retrieved May 14, 2008, from http://ericae.net/edo/ED341890.htm.

Herrmann, N. (1990). The Creative Brain. Lake Lure, NC: Brain Books.

Hobsons GradView (2008). Test Prep: Graduate School Test Preparation Overview. Retrieved October 14, 2008 from http://www.gradview.com/testprep/index.html.

Kolb, D. A. (1976). Learning Style Inventory. Boston: McBer & Co.

Keefe, J. W. and Ferrell, B. G. (1990, October). Developing a defensible learning style paradigm. Educational Leadership (48)2. Retrieved May 31, 2008 from Ebsco Host AN9107012290.

Littlefield, J. (2008). Western Governors University profile. About.com.: Distance Learning. Retrieved May 19, 2008 from http://distancelearn.about.com/od/onlineprogramdirectory/p/WesternGov.htm.

Myers, I. B., & Myers, P. B. (1995); Gifts Differing: Understanding Personality Type. (Reprint edition) Washington DC: Davies-Black Publishing.

Parnell, J. A. and Carraher, S. (2003). The Management Education by Internet Readiness (MEBIR) scale: Developing a scale to assess personal readiness for internet-mediated management education. Journal of Management Education, 27(4), pp. 431-446. Retrieved January 11, 2009, from ABI/INFORM Global database. (Document ID: 376975711).

Rafe, G., and Manley, J. H. (1997). Learning style and instructional methods in a graduate level engineering program delivered by video teleconferencing technology . Frontiers in Education 27th Annual Conference Proceedings:Teaching and Learning in an Era of Change (pp. 1607-1612). Retrieved May 13, 2008, from http://fie.engrng.pitt.edu/fie97/papers/1172.pdf.

Ravelli, B. and Patz, Z. (2004). FAST: Free Assessment Summary Tool. Mount Royal College, Calgary, Alberta, Canada. Retrieved June 16, 2008, from http://www.getfast.ca/.

Richter, R. (1992). A critical evaluation of cognitive style assessment. Human Sciences Research Council. Pretoria, South Africa: HSRC Publishers. Retrieved May 31, 2008, from ERIC (at EBSCOhost) ED355016.

Salter, D. W. (2006). A longitudinal study of learning style preferences on the Myers-Briggs Type Indicator and Learning Style Inventory. Journal of College Student Development, 47(2), 173.

Sternberg, R. J. and Grigorenko, E. L. (2001). A capsule history of theory and research on styles. In Sternberg, R. J. and Zhang, L. (Eds.) Perspectives on Thinking, Learning, and Cognitive Styles (pp. 1-22). Mahwah, NJ: Lawarence Erlbaum Associates. Retrieved May 31, 2008, from http://books.google.com/books?hl=en&lr=&id=mVMWBSZd4Y0C&oi=fnd&pg=PA1&dq=%22learning+styles%22+history&ots=jHjAkjo8g6&sig=xOp0r13Q39HaLO2S-QeYUoFbD90.

Sternberg, R., & Williams, W. (1997). Does the Graduate Record Examination predict meaningful success in the graduate training of psychologists? American Psychologist, 52, 630-641.

Sternberg, R. J. and Zhang, L. (2001). Perspectives on Thinking, Learning, and Cognitive Styles. (Eds.) Mahwah, NJ: Lawarence Erlbaum Associates.

Terrell, S. R. and Dringus, L. (1999). An investigation of the effect of learning style on student success in an online learning environment. Journal of Educational Technology Systems, 28(3), pp. 231-238.

Terrell, S. R. (2005). Supporting different learning styles in an online learning environment: Does it really matter in the long run?. Online Journal of Distance Learning Administration, 7. Retrieved May 14, 2008, from http://www.westga.edu/~distance/ojdla/summer82/terrell82.htm.

Thompson, B. and Arnau, R. (1998). Stability and internal consistency reliability of Personal Preferences Self-Description Questionnaire (PPSDQ) scores. Paper presented at the Annual meeting of the Mid-South Educational Research Association, New Orleans, LA, November 1-6, 1998. Retrieved May 31, 2008, from ERIC (at EBSCOhost) ED426089.

Whisler, V. (2005). Learner self-efficacy and interaction during the implementation of accelerated online college courses: A mixed methodology evaluative intrinsic case study. Retrieved May 31, 2008, from http://proquest.umi.com/pqdlink?did=885692411&Fmt=7&clientId=79356&RQT=309&VName=PQD.

Wilson, V. A. (1998). Learning how they learn: A review of the literature on learning styles. Retrieved May 31, 2008 from ERIC (at EBSCOhost) ED427017.