

CALL FOR RESEARCH: PERCEPTUAL LEARNING STYLES AND PERFORMANCE IN INTERNET-DELIVERED LEARNING (IDL) MARKETING CLASSES

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ABSTRACT

The rapid increase in the number of marketing classes offered via the Internet has created both opportunities and challenges for universities and marketing educators. Universities have benefited from the cost advantages of offering classes online while meeting the flexibility needs of the growing adult student population. Marketing educators at the forefront of integrating the latest communication techniques and technology have found the "net" equally challenging and filled with promise. This first generation of Internet-Delivered Learning (IDL) has been built on traditional classroom content, methods, and assessment tools. Some educators continue to question the efficacy of IDL as a "static" medium that may not address different perceptual learning styles. This exploratory paper examines two of the primary issues under question in distance learning: the effects of perception and interaction on IDL.

The authors propose a study using the VARK (Visual, Auditory, Reading, Kinesthetic) model of learning styles to assess the efficacy of IDL compared to the traditional classroom. Implications of the study may be used by marketing educators to improve their course design, web-site, and content, and, possibly, to screen new students whose perceptual orientations may warrant additional training to improve their performance in the IDL environment.

BACKGROUND

Business institutions in the 21st century are challenged to prepare an effective, competent, and high-performing workforce for the global economy. In response to this challenge, institutions are rapidly increasing IDL. While other means of distance learning (e.g. mail courses, video teaching) have been used for over 40 years, IDL is less than 15 years old, and widely available for less than five years. International Data Corporation projected the number of college students enrolled in IDL programs would exceed 2.2 million in 2003, up from 710,000 in 1998 (McGee, 2001). IDC also estimated that more than 3,300 colleges and universities would offer online courses by 2004. Additionally, Merrill Lynch estimated that the post-secondary IDL market had expanded from \$1.2 billion in 2000 to \$7 billion in

2003 (Gandhi, 2003). As a result of this growth, IDL has created substantial opportunities, along with speculation, about learning quality in the IDL environment.

Because of the rapid increase in the number of IDL classes offered, the importance of pedagogical constructs as they apply to IDL has reached a state of critical need. Questions remain on the effectiveness of transferring traditional classroom methods via computer-delivered media (Morrison, Sweeney & Hefferman, 2003). On a fundamental level, many educators continue to question whether the online classroom can even come close to replicating the perceptual richness of the traditional classroom, including the benefits of direct interaction. This is particularly true for marketing educators (Felder, 1996), where "the delivery of marketing education seems to be rapidly shifting toward pedagogy ...strongly supported by educational technology" (Young, Klemz & Murphy, 2003, p 130). Answering this question will become increasingly important, as demand for IDL goes beyond university-driven initiatives (Eastmond, 1998). Currently, the majority of distance learners is over 25 years old and has full-time careers while shouldering family and civic responsibilities (Tonkin, 2003).

One hundred sixty-five of 300 executives surveyed in a 1997 USA Today/CNN Gallup poll ranked IDL as a key business priority for the 21st Century (Koresdoski, 2001). Many of these professionals have turned to online education to meet this need. There are several explanations for this recent trend. Technological advancements have reduced the cost of transmitting and sharing knowledge at the rate of 50 percent every 18 months (Knight, 2000). Additionally, adult learners possess different learning preferences, lesser amounts of time, and greater educational expectations (Gallo, 2001). IDL provides the ability to learn, while transcending the limitations of time and distance (Koresdoski, 2001). Its unique environment allows time and location flexibility, cost savings and self-paced learning within a collaborative learning environment (Zhang & Zhou, 2003).

Characteristics of successful distance learners include active listening, effective time management, diligence, a positive attitude, the ability to

concentrate, and independence. Student online learners are likely to be adults who exhibit a high degree of personal self-efficacy, feel in control of their life outcomes, and are independent, highly motivated, and comfortable having less personal contact with their instructors, (Riddle, 1994).

Between the years 2000 and 2013, the NCES (National Center for Educational Statistics) projects an increase of 18 percent in enrollment in public institutions and a 20 percent increase at private institutions (NCES, 2004). According to the same report, the number of people earning post-secondary degrees will improve dramatically. The potential effect of this expansion to online education in undergraduate, graduate, and corporate populations suggests that not only will the trend continue, but that growth will compound, as delivery quality and student familiarity develop. "In order to meet the increased demands for access, colleges and universities need to increase their use of information technology tools via online learning, which will allow them to teach more students without building more classrooms" (Mack, 2000, p. 24).

Business schools in particular will need to respond to their adult student demands by offering online versions of their existing programs while struggling to navigate technology, pedagogy, staff, and financial challenges. "Without question, the marketing education community is well-suited to be a leader in online education. Not only have marketing departments in U. S. universities and colleges been at the forefront in developing curricula on Internet Marketing, E-marketing courses, Interactive Marketing, and similar programs, marketing academics have been leaders in conducting research on how Web-based interactions create mutually beneficial buyer-seller relationships" (Peltier, Drago & Schibrowsky, 2003). As this medium becomes more mainstream (Herther 1997), substantial debate continues on the validity and practices that enhance the online classroom experience (Frاند and Broesamie, 1996), as well as the merits of its delivery (Dumont, 1996; Rahm and Reed, 1997).

THE IMPORTANCE OF LEARNING STYLES

The increased trend towards IDL poses significant questions. Universities are offering it, businesses are requiring it, growth is demanding it, but is it efficacious? Little empirical research exists that identifies which student groups and what learning styles benefit most from this environment (Buell, 2000). Some studies suggest that students tend to learn better with visual images compared to reading or hearing information (Shorter & Dean, 1994)

One frequently accepted definition of "learning styles" is the set of cognitive, affective, and physiological factors that affect how learners perceive, interact and respond to the learning environment (Keefe, 1979). Numerous learning style typologies have been developed to conceptually understand how differences in the way students learn might affect classroom performance. Four categories have received widespread attention and use as they apply to the classroom, each with many models (www.brevard.edu). They are as follows:

1. Sensory Models (visual-auditory-kinesthetic)
2. Multiple Intelligences (eight intelligences: logical/mathematical, visual/spatial, bodily/kinesthetic, musical, linguistic, interpersonal, intrapersonal, and naturalist)
3. Social Interaction Models (collaborative or cooperative learners, competitive learners, and individualist learners)
4. Jungian Models (extraversion-introversion, sensing-intuition, thinking-feeling and judging-perceiving)

Most educators through training, practice, and feedback have learned the importance of the perceptual and interaction variances in students, as well as the benefits of mixing perceptual and interaction elements to enrich learning. To a large degree, this has been accepted as common knowledge. This "perceptual richness" of the classroom is what we believe is still one of the fundamental questions for the IDL environment. Therefore, we suggest that addressing, comparing and evaluating the perceptual elements of the IDL space is paramount to evaluating its ability to satisfy the diverse learning styles of our students.

For instance, we know that visual learners prefer to learn through stimuli such as graphs and charts, while auditory or aural learners prefer to learn by listening, and tactile, haptic, or kinesthetic learners prefer to learn through hands-on experiences involving touch or bodily movement (www.brevard.edu). Additionally, many educators have learned to mix perceptual approaches to enrich the learning experience regardless of student preference, as practice has proven that learning through multiple senses reinforces comprehension and retention.

While there are many learning style models beyond those that examine the importance of sensory differences, a sensory evaluation of learning styles is best aligned to determine if the rapidly growing IDL classroom is addressing perceptual and interaction-related differences of students and to determine if certain types of sensory learners do better or worse in an IDL classroom compared to the traditional classroom environment. Ultimately, we may answer

the question of how the IDL class compares with the traditional classroom in addressing perceptual differences, and if there are perceptually-driven learning differences that need to be better understood, addressed, and improved.

SENSORY LEARNING MODELS

Some of the sensory models include the Personal Learning Style Inventory (Wyman, 1999), Self-Administered Inventory of Learning Styles (Siegel & Lester, 1994), DVC Learning Style (Jester, 2000), and VARK (Fleming, 1998). Of these models, the VARK model parallels the perceptual and interaction elements we have discussed. The VARK model evaluates how students absorb information through their senses and which sense students tend to employ most often. These include:

- visual (sight);
- auditory (hearing);
- reading (writing); and
- kinesthetic (movement & interaction).

This might be best understood by how students characterize their learning. Some students may say "I like hearing explanations" or; "I like practical classes and hands-on activities", rather than reading books and listening to lectures. Others may say; "Show me a table or chart" rather than listening. While everyone uses all available senses to absorb information, the model identifies the perceptual ability the students rely on most. As educators, many of us not only understand these differences but actively monitor and adjust our classrooms to address differences in our students' perceptual preferences, as well as to integrate sensory variation that enriches learning. Traditional educators continue to wonder how these perceptual elements are addressed online. Several questions come to mind. Does computer-based, IDL content address the different perceptual and interaction needs of our students? How does this medium (in its current state) compare to the classroom? And, do specific learning styles benefit or suffer in current IDL environments? This work complements the work done by Morrison, Sweeney, and Hefferman (2003) and extends the work of other studies where learning styles have been evaluated within marketing classes such as Tom & Calvert (1984).

PURPOSE OF THE STUDY

The purpose of this study is to provide an exploratory next step in the evolving research on learning styles by utilizing the VARK Learning Style Inventory to determine if learning styles make a difference in grades for IDL marketing students and traditional

classroom students. Specifically, we examine the interaction of delivery methods and learning styles. The questions are:

1. How do Visual Style learners perform in an Internet Delivered Learning environment, as measured by grades, compared to students in traditional classes?
2. How do Auditory Style learners perform in an Internet Delivered Learning environment, as measured by grades, compared to students in traditional classes?
3. How do Reading Style learners perform in an Internet Delivered Learning environment, as measured by grades, compared to students in traditional classes?
4. How do Kinesthetic Style learners perform in an Internet Delivered Learning environment, as measured by grades, compared to students in traditional classes?
5. How do Multi-Modal Style learners (e.g. V/R styles) perform in an Internet Delivered Learning environment, as measured by grades, compared to students in traditional classes?
6. How do covariates AGE, SAT Verbal, and SAT Mathematical affect grade in an individual class and GPA?
7. What variables distinguish best among learning styles: gender, age, major, GPA, class discipline, evaluation of the instructor, class level, SAT Verbal, SAT Mathematical, and delivery method.

STUDY DESIGN

Population: The study will survey both classroom and IDL students at a private southeastern university. The university is the largest Catholic business school in the U.S., with more than 8,000 enrollments offered online and more than 3,000 in the traditional classroom in a given term. This school was selected because of its size. The online classes are hosted on a Web CT-based platform, which is one of the top two global IDL environments. The combination of having one of the largest IDL universities with one of the predominant tools (Web CT) offers a reasonable sampling environment for this study. Classes will include traditional classrooms and online classes taught by the same professors. Students will be issued the VARK Questionnaire to determine their learning style at the beginning of the semester. Data in this study will be collected using the VARK

Questionnaire, as surveys are the most popular method used in education for the collection of data (Isaac and Michael, 1995).

Pre-test: Our pre-test is to determine whether asking respondents to provide personal information (e.g., identification number which is used to access additional information, for example, GPA, and class grade) influences response rates, and whether response rates differ by delivery method. This will be done in the classes different from those of the actual experiment. The survey will include questions on evaluating the professor and on whether they enjoy the subject matter.

Within the delivery method (i.e., traditional classroom and online), we compare two groups: asking respondents for an identification number and not asking. Within the class, students are randomly assigned to the identification or no identification condition. Because we want to compare the within delivery method, we need an even number of classes for both: six online and six traditional. This number was chosen because it provides three sections each of: online with the identification number; online without the identification number; traditional classroom with the identification number; and traditional classroom without the identification number. In the event the groups are of different sizes, we will randomly choose an equal number of subjects from all groups. Classes are randomly assigned to condition. Our research questions here are whether response rates will differ when personal information is required and whether they differ by delivery method. Using a proportion test for response rate, we will test: i) the two online groups (with and without identification) against each other; ii) the two traditional classroom groups (with and without identification); and both online and traditional classroom groups with an identification number against both online and traditional classroom groups without an identification number. In the event any of the tests are statistically significant, we will focus on improving response rates prior to the main study in those areas that with low response rates. Assuming no differences, we will proceed to the main experiment: comparing learning styles by delivery method. In comparing actual answers, a t-test for comparing means of two independent samples is used, with the same comparisons as the proportion test.

Data Collection: To minimize instructor differences, we will choose classes where instructors are teaching the same class, at the same time, both online and in the traditional classroom. Our assumption is: instructors will try to adapt the delivery method to fit

their style, although the delivery method may limit some adaptations. Although we believe learning styles are inherent in a person and not contingent upon the class they are administered in, we do believe certain learning styles are better for specific disciplines. Thus, we will examine different disciplines and two different levels per discipline: introductory and upper-level. For each discipline, we will examine four different classes per level (i.e., four different upper-level marketing classes). Our disciplines will include marketing, mathematics, and English. The list of classes is as follows:

- i) four upper-level marketing classes: two online and two traditional;
- ii) four principles of marketing classes: two online and two traditional;
- iii) four upper-level Applied Decision Making for Managers (includes forecasting, linear programming): two online and two traditional;
- iv) four introduction to statistics classes: two online and two traditional;
- v) four business communication classes: two online and two traditional;
- vi) four introductory writing classes: two online and two traditional.

The survey will include questions on learning styles, whether they enjoy the discipline in which they are taking the class (four-item scale), evaluation of the instructor (four-item scale), number of classes they have taken in the online and traditional classroom environment, and their student identification number. From the identification number, we will access the students' gender, GPA, SAT (Verbal and Mathematical), age, major, class grade, class subject, and academic level.

Scale Validity: In our analysis, coefficient alpha and item-to-total scores will be examined for reliability for the VARK questions. After determining the data's appropriateness for factor analysis, the VARK questions, it will be submitted to a confirmatory factor analyzed to see if the questions load on the predetermined dimensions. The three different questions per learning style (four learning styles) should load together. This will be done for all 24 classes, or over 400 students.

ANCOVA: We attempt to determine how learning styles and delivery method affect grades. Grades within a class are caused by a measure of basic intelligence (SAT is used as a proxy), experiential learning (age is used as a proxy), learning style, delivery method (two levels), and discipline (three levels). Grades are contingent on a myriad of factors. We have attempted to capture the most important factors for our environment. "The reality of most

classroom environments is that there is a multitude of instructional factors that produce a joint effect on learning" (Young, Klemz & Murphy, 2003, p 130). The two dependent variables should be correlated, so individual ANCOVAs are estimated instead of a single MANCOVA; otherwise the MANCOVA is tapping into the same construct instead of different constructs.

SAT is used as a proxy for basic intellect. Those scoring higher are assumed to have more cognitive ability, although this must be coupled with motivation and time for success, as well as other areas too difficult to measure. In general, greater intellect should enhance grade score. Life itself provides many lessons, so we may expect that this experiential learning may also enhance grades; age is our proxy here. The delivery method itself may influence grades. This begins to address the differences in learning styles; thus, an interaction may exist between delivery method and dominant learning style. The delivery method may exclude a person's dominant learning style. In a broad sense, students may be more comfortable with one delivery method over another, which may enhance learning, thus, influencing grades. The subject matter also plays an important role in grades. In an area the student enjoys, one would expect better grades, when compared to a class a student is taking because it is required. Here too, interaction may occur between discipline and learning style.

Under the VARK model, respondents can have multiple learning styles. The respondents dominant learning style will be used for analysis. In the event a respondent has two dominant learning styles, both will be used for analysis. Before undertaking the analysis, the model's basic assumptions are tested (e.g., homogeneity of variance). Our model is as follows:

Class grade = delivery method + learning style + discipline + interaction of delivery method and learning style + interaction of learning style and discipline + SAT Verbal + SAT Mathematical + age

GPA = delivery method + learning style + interaction of delivery method and learning style + SAT Verbal + SAT Mathematical + age

CHAID: To identify variables that correlate with learning styles, we will use CHAID (Chi-squared Automatic Interaction Detector), CR&T (Classification and Regression Trees), and Discriminant Analysis. Each variable is compared by examining its individual ability to predict membership in one of the four learning styles. We will distinguish between learning styles based on gender, age, major (categories),

GPA, class discipline (categorical), evaluation of the instructor (four-item scale), class level (categorical); questions on whether they enjoy the discipline in which they are taking the class (summed scale), SAT Verbal score, SAT Mathematical score, and delivery method (categorical).

C&RT is "a binary tree-growing algorithm" while CHAID creates non-binary classification trees. C&RT usually results in more levels than CHAID, but it is also not as efficient in its solution as CHAID. Solutions usually center on variables that can be subdivided. CHAID creates classification trees by selecting the best predictors (classification variables) for the target or dependent variable (cluster membership), so that sub nodes become smaller (fewer members) and more homogenous than previous nodes. Within a branch, each node is mutually exclusive (SPSS Answer Tree 3.0). Stopping rules are established for the solution: parent nodes must have a minimum of 15 members and sub nodes a minimum of five. Since we have a small dataset, the model is cross validated by separating the respondents into 10 sub nodes. "For each tree, misclassification risk is estimated by applying the tree to the sub nodes excluded in generating it. The cross-validated risk estimate for the overall tree is calculated as the average of the risks for all of these trees" (SPSS Answer Tree 3.0, p. 29). A 95 percent confidence level was chosen. One cautionary note: "CHAID is analogous to a forward stepwise regression analysis and has all the possible attendant difficulties of such stepwise regression" (Measurement Group 2003).

LIMITATIONS

The use of a convenience sample from one university limits the generalizability of the results. The university's IDL population is adult-centered (large portion over 25 years old), and the results may differ if the research is conducted with a more typical-age under-graduate IDL population. Only three disciplines are examined, although each is different from the others.

CONCLUSIONS

According to Gallo (2001), the fact that limited attention is being paid to individual learning styles of IDL students poses a significant concern regarding this educational trend. IDL designed for all does not account for each individual's learning style and unique learning needs. By assuming one system will meet the needs for everyone, a designer of an IDL program could exclude individual learners. The ability to develop a profile of each learner is critical to

addressing learning-style diversity and designing programs to capitalize on it (Gibson, 1998). Addressing the perceptual learning differences is a first-step in determining if IDL is serving the needs of different students, and whether or not learning styles play a significant role in the success of IDL marketing students. *The study will be significant* for marketing instructors seeking to design more effective IDL courses and students seeking successful learning environments.

REFERENCES

Furnished upon request