Volume V, Spring Issue

May 2015

HETS ONLINE JOURNAL

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Message from the Chairman

Welcome to the spring issue of the HETS Online Journal,

I am delighted to present the spring issue of the fifth edition of this publication. We are proud because, since its third edition, the journal is being included in EBSCO Publishing's databases. EBSCO Publishing caters to the information needs of researchers at every level by providing the content to bring the latest and best information to researchers.

The HETS journal has been characterized because it addresses relevant topics impacting technology and Hispanic Students; this issue is not an exception. Our readership includes researchers, scholars, students and organizations who are interested in technologies, higher education and the Hispanic population. The journal also highlights the use of technology to improve pedagogy. It is only through publications such as the HETS Online Journal that we can focus a wide spotlight on the good work that is being done by our colleagues.

It is my sincere hope that you share the link to our journal with your colleagues. Should you have an innovative technique or would like share your knowledge and experience in technologies impacting higher education, please **consider submitting an article** for spring edition **on or before September 18, 2015**.

My sincere gratitude to new editor in Chief, Pamela Vargas, and members of the Editorial Board: Dr. Marzie Jafari, Dr. Naydeen González De Jesús, Prof. Ana Milena Lucumi, Dr. Ernest Gil Clary, Mr. Sunil Gupta, Dr. Manuel Correa, Dr. Carlos Morales, Mr. Carlos Guevara, Dr. Juan "Tito" Meléndez, and Pura Centeno for accepting the challenge of reviewing and selecting the articles among the many exciting submissions received. We would like to recognize the hard work, commitment and dedication of all.

I hope you find our spring issue both informative and interesting.

Manuel J. Fernós, Esq.
HETS Chair
President, Inter American University of Puerto Rico

Message from the Chief Editor

Welcome to the spring 2015 edition of the HETS Journal!

In keeping with the mission of HETS, you will find articles that provide insight into the use of technology to help our students succeed.

This edition offers a range of topics. You will find information that documents the use of review workshops in a gatekeeper course, the effectiveness of gaming as a teaching strategy, and the importance of open educational resources.

There are updates to a previous study on distance education, thoughts on *metalectura* (the process of reading texts effectively), the structuring of hybrid and online courses, and the use of learner profiling to predict the likelihood of choosing e-learning courses.

We hope that you will fund useful information that can be applied to your institution or perhaps studied further to add to the body of knowledge.

Sincerely,

Pamela Vargas

Assessment of a Technology-Enhanced Review Workshop before Final Exams in an

Undergraduate Human Anatomy and Physiology Course

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Assessment of a Technology-Enhanced Review Workshop before Final Exams in an Undergraduate Human Anatomy and Physiology Course

Abstract

Gateway science courses are challenging for community college students, particularly for underrepresented Hispanic students who struggle with the course content as well as time management in their daily lives. In order to improve their academic success and understanding of Human Anatomy & Physiology, a series of two-weekend Anatomy and Physiology review workshops were offered prior to the cumulative final exams. Among others, teaching strategy included presentation of 3D animation video clips illuminating step-by-step biomedical processes, followed by fun Jeopardy-style Quiz competition. The competitions aimed at stimulating student interest and triggering their instant feedback that would reflect the level of their comprehension on topics of challenge. Our findings showed that the rate of passing, particularly grades of C+ and higher (required in all nursing courses), was consistently higher for workshop participants than for non-participants. We believe that the technology-enhanced workshops created an exciting, game-like learning environment that resulted in greater engagement and better academic performance among our students.

Introduction

Human Anatomy and Physiology (commonly offered in two parts as A&P I & II), is a required course for many health science programs such as nursing, radiological technology, and nuclear medicine. Challenges that students of A&P face, and therefore their instructors do as well, have been the subject of numerous studies (Michael, 2007; Feder, 2005; Michael et al., 2009; Sefton, 2005; Harris et al., 2004). One major reason would naturally be the complexity of many advanced concepts that students must assimilate (Morton et al., 2007; Silverthorn, 2002; Vander, 1998). Others could be attributed to ineffective study strategy (Husmann, 2015) and weak foundation in biological knowledge (McKee, 2002).

Bronx Community College (BCC) is a Hispanic Serving Institution where student enrollment consists approximately of 60% Hispanic and 30% African ethnic background. The college offers a variety of health science programs, and A&P I is one of the highly enrolled courses (~10% of total student population). However, it also has the highest failure rate among other gateway biology courses (less than 30% of students achieving the required standard with a grade of C+ or greater). For our students, time limitation from family and work responsibility is an added challenge in addition to those mentioned above.

While individual tutoring sessions would obviously provide the greatest help to students such as ours, group-based workshops have also been shown to provide effective support in many instances (Bloom, 1984; Drane et al., 2005; Houlson, 2007; Mattheis and Jensen, 2014). To maximize students' success rates and conceptual understanding of A&P I, a series of two-weekend review workshops were offered before the final exams for two consecutive years. In

the second year, biomedical animations and Jeopardy-style quiz competition (embedded in PowerPoint presentations) were incorporated as tools to coach students "how to think" rather than "how to memorize," which also proved to be fun and motivational (Bender & Randall, 2005). Here we demonstrate that the review workshop and the integration of these technology-based tools improved student learning as assessed both by the percentage of students who passed the course and the percentage of students who acquired grades C+ and above.

Methods

To assess the effectiveness of the Human Anatomy and Physiology I (A&P I) final exam review workshop on students who participated versus students who did not, the final grades for A& P I of both groups were used as the primary indicator of workshop success. The mean GPA of these students was also obtained from official school transcripts and used as a reflection of their general academic abilities.   This course was taught over a one-semester period. Four workshops over four consecutive semesters (excluding summers) have been conducted to date (SP13, FA13, SP14 and FA 14). A total of 184 A&P I students took part in the final review workshop (49, 45, 46, and 44 respectively). All participants took part at least in one weekend review session (either Saturday or Sunday session to fit into a variety of working/course schedules) which covered a total of nine topics consistently identified by students as well as instructors as difficult (Homeostasis, Chemistry and Biomolecules, ATP production, Protein Synthesis and Membrane Transport, Nervous, Skeletal, Muscular and Endocrine Systems). Two faculty members (randomly selected for sessions and topics) each semester volunteered at

each workshop. Students enrolled in each session were randomly assigned to professors of the workshop. The enrollment was not revealed to their A&P I instructors before or after the grading

of their final exams was completed. Teaching methods included model demonstrations, small group discussions, in-class writing activities, and direct instruction using PowerPoint slides. These models and PowerPoint slides with diagrams, photos and texts explaining major structures and functions were identical to those used in the regular A&P I classes. However, a unique motivational strategy_ 3D animation and subsequent Jeopardy Quiz Competition_ embedded in these PowerPoint slides was introduced for the two most recent semesters (Sp2014 and Fa2014) to further foster students' understanding. Jeopardy game is where the dollar amounts on the Jeopardy board link to different slides with the questions, which then link to slides with the answers. An example of a fun Jeopardy-style quiz question ($200) that was introduced after a 3D animation illuminating the process of glycolysis and cellular respiration for ATP production is that:

"Which process does NOT release energy from glucose?"

a. glycolysis. b. fermentation. c. cellular respiration. d. photosynthesis

Specifically, the Jeopardy-style Quiz game consisted of five untimed and multiple-choice questions for each topic. Questions in each topic were progressively more difficult from top to bottom. Selecting the correct answer led to a slide featuring written praise and feedback regarding why the answer was correct. Students were able to continue selecting responses until the correct answer was selected (e.g. see **Exhibit 1**).

Participants

Participants were instructed to pre-register for one session of their choice with their name and section number at the bulletin board outside the department office. Each participant had comparable cumulative credits with varying biological background. A&P I is a required prerequisite course for all participants (majoring in Allied Health programs).

Data Sources

We obtained three main sources of data for analysis. First, final exam grades of A&P I were assessed. Both groups were given the same final exam that included 75 multiple choice questions. It was cumulative with 25 common questions (identical for all sections of A&P I) and 50 different questions selected by each instructor. Moreover, passing (D or above) and withdrawing rates were compared, along with cumulative GPA and credits. Finally, we calculated the rates of C+ and above among both groups, since these are the minimum passing grades for Nursing, Radiological Technology and Nuclear Medicine programs.

Analyses

Data were analyzed using descriptive and inferential statistics. Means, standard deviations, t-tests for workshop participants and non-participants were used ($p \leq 0.05$) to determine significance when comparing final grades, GPA, credits, and rates of pass and withdrawal, as well as grades of C+ and above.

Results

Over the period of four consecutive semesters, the academic performances of 1,226 students who continued in the course were examined. Students who have received non-academic grades ("Incompletes" and all variation of "Withdrawals") were not taken into consideration. Of the 1,226 students, 184 students have participated in the workshop, comprising approximately 15% of the continuing students. Table 1 lists course-based parameters that include the rate of passing, the rate of earning grades C+ and above, the rate of grades between D- and C, and the average course grade (on a scale of 4) for each semester under investigation. These values were compared between the populations of students who have participated in the workshop and of those who have not (which constitutes the majority).

For each semester, the rate of passing was consistently higher for workshop participants than non-participants. To assess the degree of consistency in the results through time, the average and the standard deviation about the average for the measured parameters were calculated (Fig. 1). For all four semesters, the average rate of students passing the course was 96.2% for workshop participants and 89.5% for non-participants, indicating a 6.7% improvement in workshop participants. Relatively low standard deviation about the average (1.1% for workshop participants and 0.9% for non-participants) supported that there was a significant degree of consistency over time with respect to the passing rates. In order to assess if the 6.7% improvement in the passing rate was statistically significant, the results were subjected to t-test analysis. The two-tail p-value (by two-sample unequal variance method) was $p = 0.0001$, a statistically significant value (i.e., it is less than 0.05).

Grades C+ and above are considered high-achieving in this course. In the first two semesters (spring and fall 2013), there was an apparent decrease in this group of grades for workshop participants (61.2%) as compared to non-participants (54.1%; Fig. 2). However, t-test analysis showed that this was merely a statistically insignificant fluctuation (p = 0.24). On the other hand, workshop participants showed a significantly higher rate of grades C+ and above over non-participants (70.0% vs. 56.8%) in the last two semesters (spring and fall 2014; p = 0.03). Changes in the teaching strategy with greater application of technology-based teaching tools can be attributed for this increase. Details of this will be explored in the discussion.

The rate of grades between D- to C showed comparably similar increases in spring and fall 2013 for workshop participants (28.9% to 38.8%, and 28.8% to 44.4%, respectively; Table 1). Therefore for these semesters, the increase in the rate of passing was due to increases in the D- to C group, i.e., being rescued from failing. For spring and fall 2014, however, the D- to C group showed a decrease for workshop participants (34.0% to 26.1%, and 30.2% to 27.3%, respectively). This indicated that the increase in the passing rate for the last two semesters was due to an overall upshift of the grade distribution (if a bell curve is assumed). The implication of this will be further explored later.

To assess if the general academic standing is a contributing factor in the observed increase in the rate of passing and the rate of high-achieving grades, the average GPA and the cumulative credits of the participants and non-participants were examined (Table 2). Combining data from the first three semesters, the mean for the average GPA was 2.85 (SD ±0.32) for participants, while it was 2.82 (SD ±0.2) for non-participants. (Data for fall 2014 was not

incorporated due to unavailability.) T-test analysis showed that this difference was statistically insignificant (p = 0.91). In addition, the mean for the cumulative credits was 22.9 credits (SD ±3.2) for participants and 23.6 credits (SD ±0.9) for non-participants. The difference was also found to be insignificant (p = 0.76). This supported that the observed 6.7% improvement in the rate of passing and the increase in the rate of high-achieving grades by workshop participants was not caused by possible selection biases such as the average GPA or the accumulated credits.

Discussion

This study sought to explore the effect of a technology-enhanced review workshop before cumulative final exams on students' performance in an Anatomy and Physiology I class in a Hispanic-serving community college. Our results showed that participation in the workshop increased rate of passing the course by an average 6.7% over four semesters compared to the group of students who have not participated. This improvement was found to be meaningful as our data analysis supported that the general academic background such as the cumulative GPA and the credits of participating students were not any (statistically) different than the non-participating students (who constituted the majority). Perhaps a bolder emphasis can be made on the consistency, or the repeatability, of the improvements through time (Fig.1). This stability in the rate of passing for participants indicates that efforts such as these review workshops may produce a more permanent imprint or a "dent," especially against a consistent performance of the general population. That is, the consistency in the passing rate of non-participants is

indicating that the current rate of student achievement may have reached a point of equilibrium that may be difficult to shift.

To make learning more fun and motivational, we integrated biomedical animations followed by a Jeopardy game show-style quiz competition embedded in the PowerPoint presentation in the exam review process of two most recent semesters (Sp2014 and Fa2014). The interactive nature of the game show format not only allowed instructors to observe and evaluate in real-time how effectively students acquired, retained and applied the review content, but also provided a unique opportunity for students to self-assess their knowledge in particular areas of a topic while increasing their comforts with taking risks in front of their peers (Lavine 2011; Bender & Randall 2005; Rotter 2004). Our results indicate that interaction with the game in the two review workshops of 2014 produced both higher passing grades and grades of C+ & above. We believe that review material offered in this format may make studying more interactive, easier, and ultimately more enjoyable. Thus, significantly better performance of our workshop participants was achieved by enhanced comprehension of key topics and greater control of test anxiety (feeling overwhelmed and out of control), double benefits of participating in our technology-enhanced workshops.

With respect to the mechanisms of improvements presented here, examination of low-achieving grades (D- to C) showed that the rate of passing can be improved in two ways. One would be by an increase in the number students who have been rescued from failing and move into this category as shown by data in 2013. The other would be by an increase in the number of high-achieving grades (and a reduction in the low-achieving grades) that in effect would produce a general upshift of the grade distribution, as shown in 2014 when more educational

technology was integrated and implemented into our workshops. The preferable change would always be latter case, or put in different words, an improvement in overall learning experience.

In the future, we plan to further evaluate and develop Jeopardy-style game questions and customize them for regular teaching sessions. Given that student-generated questions usually target the areas of complex content that require higher level of reasoning skills, course instructors will keep track of student questions generated by the discussion boards of Blackboard, lecture and laboratory studies and transform them into interactive game questions within progressively more complex near "real-world" biomedical scenarios (Hoppes & Chesbro 2003).

Although technology in classroom instruction offers one possible example of a significant enhancement in the final exam performance in our case, we do not believe it should be a complete substitution for traditional instructor-led teaching and self-motivated learning. As a Hispanic-serving community college, a large number of our students struggle daily to manage time between reading a solid portion of a textbook related to a difficult topic and busy working schedules as well as family obligations. Students juggling classes and jobs aren't inclined to take part in our final review workshop, and therefore are more likely to fail the course repetitively. The sustained success of our final review workshop over the past two years provided both low-income and underprepared students, as well as instructors in other minority-serving institutions facing similar challenges with valuable insight into time commitment and personal learning styles necessary to succeed in a difficult course (Michael 2007).

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Exhibit 1. A snapshot of game board of "Jeopardy" in our A&P review workshop, from which students chose their topics and questions. Questions in each topic were progressively more difficult from top to bottom, hence worth more dollar amount.

Semester	Spring 2013		Fall 2013		Spring 2014		Fall 2014	
Workshop participation	NO	YES	NO	YES	NO	YES	NO	YES
Number of students	253	49	257	45	244	46	288	44
Rate of passing (%)	89.3	95.9	90.7	95.6	89.3	97.8	88.5	95.5
Rate of grades C+ & above (%)	60.5	57.1	61.9	51.1	55.3	71.7	58.3	68.2
Rate of grades between D- to C (%)	28.9	38.8	28.8	44.4	34.0	26.1	30.2	27.3
Average course grade (scale of 4)	2.28	2.23	2.34	2.24	2.17	2.66	2.32	2.57

Table 1. A&P I Final Review Workshop Summary Report. Data were collected over four consecutive semesters involving a total of 1226 continuing students, among which 184 students have participated in the workshops. Listed rates were calculated as percentage of grade groups with respect to the corresponding number of students.
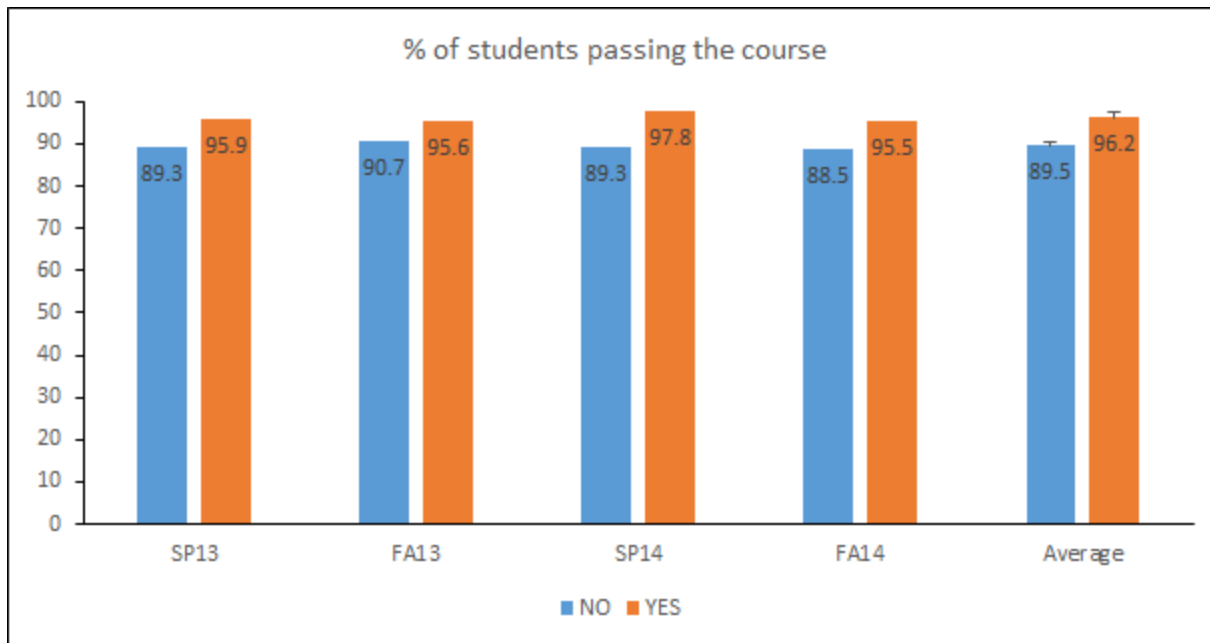
Figure 1. Consistency in the improved rate of passing Anatomy and Physiology I by workshop participants over nonparticipants through four consecutive semesters. The average passing rate is 89.5% (SD ±0.9%) for non-participants while it is 96.2% (SD ±1.1%) for participants, leading to a difference of 6.7%. This improvement was found to be statistically significant according to t-test analysis (two-tail p = 0.0001).

Workshop participation	NO		YES	
	Mean	SD	Mean	SD
Average GPA	2.82	0.20	2.85	0.32
Average cumulative credits	23.6	0.9	22.9	3.2
Average number of students	251.3	6.7	46.7	2.1

Table 2. A&P I final review workshop participants and nonparticipants are in similar academic standing. The p-value for a two-tail t-test is 0.91 (Average Cumulative GPA) and 0.76 (Average Cumulative Credits), respectively. Both are statistically insignificant. The data is based on the first three semesters (spring 2013 to spring 2014).
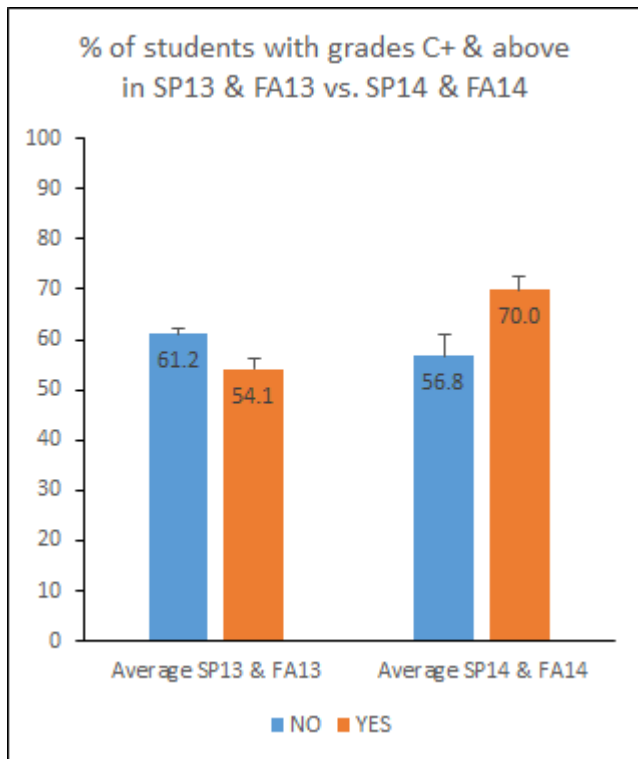
Figure 2. Improvement in the rate of grades C+ and above in spring and fall 2014 as a result of increased application of technology-based teaching tool. The apparent decrease in workshop participants in spring and fall 2013 was found to be statistically insignificant by t-test ($p = 0.24$). On the other hand, the increase in workshop participants was tested statistically significant ($p = 0.03$) in spring and fall 2014.

Gamification as a Teaching Strategy: Is It Effective?

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Gamification as a Teaching Strategy: Is It Effective?

Abstract

Gamification has become a trending concept in online courses for the past 10 or more years. Based on the analysis of psychological and social factors that make electronic games highly used in today's population, gamification suggests ways to improve education course innovation, student engagement, student motivation, student critical thinking, and student decision-making. The question is, "Is it effective?" This paper evaluates an online graduate course in business administration at a state university with a majority Hispanic student population to determine if the concept is effective as a teaching strategy option.

Introduction

Among the great challenges in higher education is developing methods and techniques to foster innovation, creativity, motivation, engagement, and learning into effective design and delivery of courses in all platforms, but in online courses in particular. Online course design and implementation have recognized the perceived and proven results of gaming and simulations as teaching strategies during the past sixty years.

Although the charge to incorporate the concepts of gaming and simulation into educational and learning experiences has been experienced for decades and even centuries (Chou, 2015), the concepts that comprise gaming theory and strategies have only become codified into consistent definitions and techniques with the needs derived from the challenge of creating better, more effective learning processes in online courses.

Through the evolution of course development, the assumption seems to have been made by course designers that the increasing population of game players in the online world naturally extends skill development to the learning environment. According to the Entertainment Software Association, the average age of current game players in the population is 30. Of those, 68 percent of the gamers are above the age of 18, primary college age (NMC Report, 2014, p. 42). So the base assumption is that higher education students have higher skill sets because of exposure to sophisticated games in their operational environment.

The latest growth of gamification in learning seems to result from commercial efforts to provide training for employees and to increase numbers, loyalty, orientation and instructions for customers (NMC Report, 2014, p. 42). According to a Pew Research Center report, gamification is "…interactive online design that plays on people's competitive instincts and often incorporates the use of rewards to drive action -- these include virtual rewards such as points, payments, badges, discounts and free gifts; and status indicators such as friend counts, re-tweets, leaderboards, achievement data, progress bars and the ability to level up" (Anderson, J. and Rainie, L. 2012, p. 1; Farber, 2013, p. 1). For the purposes of this paper we will define gamification as using gaming design, game elements and mechanics and applying them to a non-game based environment.

In the NMC Horizon Report for 2014, critics suggest gaming in the commercial applications in business will be a short-lived trend that results in short-term bursts of productivity. But, according to the report, educational applications of gamification are showing "…that game-like environments transform assignments into exciting challenges, reward students for dedication and efficiency, and offer a space for leaders to naturally emerge" (NMC

Report, 2014, p. 42).

Games have spent decades (or even centuries depending on how you define a game) mastering motivation and engagement. Games are now teaching us how to motivate and engage players. Thus, the concept is called "Gamification". (Chou, 2015). The effects of gamification applied to learning are generally described as increasing student engagement in learning activities, increased application of critical thinking, more creative problem-solving, and more effective teamwork. (Reeves and Read, 2009).

As gamification has accelerated in its academic scrutiny, several frameworks defining the characteristics of educational game application have arisen. Several are introduced here.

Theoretical Framework

Among the frameworks for gaming in educational course development, several have made significant contributions to detailing and measuring course design elements to ensure the greatest likelihood of accomplishing the intended goals of creation of innovation, critical thinking, motivation, and engagement. Almost, if not all, of the theoretical frameworks offered in current literature are true models in that they are the conclusions drawn by observers to illustrate the identified characteristics of well-designed online courses that have the greatest probability of achieving optimum student learning.

This paper will look at several of these framework definitions in a layered approach. It will begin with the simplest categorization: Micro vs. Macro Gameplay (Kim, 2010). These categories have distinct application in the development process. Kim defines Micro Gameplay as implementation of online capacities down to small elements of control such as movement of

player directions or acquisition of specific information from a game object. Kim's definition for Micro gamming is:

> Micro (short for "micromanagement") refers to the level of granular and specific control a user has over game units. In the *Warcraft 3*, the user's skill and ability to control their hero and other game units to attack enemy units and avoid/dodge enemy unit attacks defines a user's micro. (Kim, 2010, p.1)."

Macro Game Playing is suggested by its name. It implements gaming at the highest, most abstract level of game interaction. As Kim defines Macro Gaming:

> Macro (or "macro-management") refers to higher-level strategic game considerations that are not based on granular twitch/reflex based control of game elements. Again, using the *Warcraft 3* example above as a reference, in this case good macro skill would involve:
>
> - Strategy: The player's game strategy to win including issues such as planned attack sequence, game style, and building development progression
> - Resource Management: The management of game resource materials to build buildings faster and more effectively
> - Map Awareness: Ability to predict and properly adjust to what an enemy may be doing by watching map movements (or lack of movement) (Kim, 2010, p.1)

As Kim suggests, the most effective games include elements of both Macro and Micro Gaming as a strategy to initiate the primary gaming advantages to player learning, Innovation, motivation, critical thinking and engagement.

The second layer is the concept of the application of Gamming-Process and Gamming-Informed. (Begg et al, 2005). This criterion focuses on the learning process and how it conforms to the implementation of an activity that clearly conforms to definition as a game. It compares this view against one suggesting that game elements are used in an education environment to achieve the basic gamming goals in a more direct and accessible learning process (Begg, et al, 2005) .

Begg, et al, suggest that learning is most effective in the game-informed concept that does not require the learning content to be incorporated directly into a recognizable game format. Instead, it can be most effectively developed meeting the following criteria:

- The backstory gives an emotional "in" for context and character role.

- Intrinsic feedback enhances students' enjoyment and feeling of agency, increasing opportunities for learning by encouraging students' willingness to learn difficult material (Malone 1982).

- The ability to act in an emotionally engaging simulated situation without the serious consequences that such action might have in the real world (the "psychosocial moratorium" of Erickson) allows for repetition and improved performance as well as more committed performance from students (Gee 2003).

- Students assume identities within the application and perform accordingly.

- Students develop an emotional attachment to the character within the application that contributes to the learning experience by helping students to perceive the application as a real, situated experience (Ryan, 2001).

Begg, et al (2005) came to these conclusions studying effective learning activities in medical schools, but conclude that the characteristics are just as applicable to other discipline learning.

As defined earlier, Gamification is "…the craft of deriving all the fun and engaging elements found in games and applying them to real-world or productive activities"(Chou, 2015.) The concept has been labeled "Human-Focused Design." The alternative is called "Function-Focused Design" (Chou, 2015).

"Function-focused" design seeks to get the job done quickly. Much of what is discussed as pedagogy falls into this category. There, "effectiveness" in learning equates to "efficiency" in learning. Human-Focused Design, on the other hand, is based on the concept that people in a system have feelings, insecurities, and reasons why they want or do not want to do certain things, and therefore optimizes for their feelings, motivations, and engagement (Chou, 2015).

The Human-Focused design is illustrated in Figure 1, The Octalysis, and suggests categories of activities, artifacts, and outcomes that can be manipulated to produce highly effective learning processes in education. (Chou, 2015).

Chou's conclusion in his Octalysis Model is that a key to successful gaming as a learning tool is that the activity should be "fun" (Chou, 2015). This is suggested because games have as one of their primary purposes to make the game player happy with the experience. And games are "fun" because they are related to the eight elements of the Octalysis Model (Chou, 2015).

-Points
-Badges (Achievement Symbols)
-Fixed Action Rewards
-Leaderboard
-Progress Bar
-Quest Lists
-Win Prize
-High-Five
-Crowning
-LevelUp Symphony
-Aura Effect
-Step-by-Step Tutorial
-Boss Fights

-Virtual Goods
-Build from Scratch
-Collection Set
-Avatar
-Earned Lunch
-Learning Curve
-Protection
-Recruitment
-Monitoring

-Appointment Dynamics
-Fixed Intervals
-Dangling
-Prize Pacing
-Options Pacing
-Patient Feedback
-Count Down
-Throttles
-Moats

-Narrative
-Elitism
-Humanity Hero
-Higher Meaning

-Beginners Luck
-Free Lunch
-Destiny Child
-CoCreator

-Milestone Unlock
-Evergreen Mechanics
-General's Carrot
-Real-Time Control
-Chain Combos
-Instant feedback
-Boosters
-Blank Fills
-Voluntary Autonomy
-Choice Perception

-Friending
-Social Treasure/Gifting
-SeeSaw Bump
-Group Quest
-Touting

-Bragging
-Water Cooler
-Thank-You Economy
-Mentorship
-Social Prod

-Glowing Choice
-MiniQuests
-Visual Storytelling
-Easter Eggs
-Random Rewards
-Obvious Wonder
-Rolling Rewards
-Mischief
-Sudden Rewards
-Oracle Effect

-Sunk-Cost Tragedy
-Progress Loss
-FOMO
-Evanescence Opportunity

-Status Quo Sloth
-Scarlet Letter
-Visual Grave
-Weep Tune

Meaning
Accomplishment   Empowerment
Ownership   Octalysis   Social Influence
Scarcity   Unpredictability
Avoidance

YUKAICHOU

Figure 1. Octalysis: Complete Gamification Framework. Copyright 2014 Octalysis. (Chou, Y.

2015)

This conclusion by Chou is among the rare places where the idea of "fun" is specifically

talked about. However, considerable research has been focused on the role "fun" has in

successful gaming. Lazzaro (2015) has proposed a construct of four different types of fun that

are used in developing games in the commercial environment.
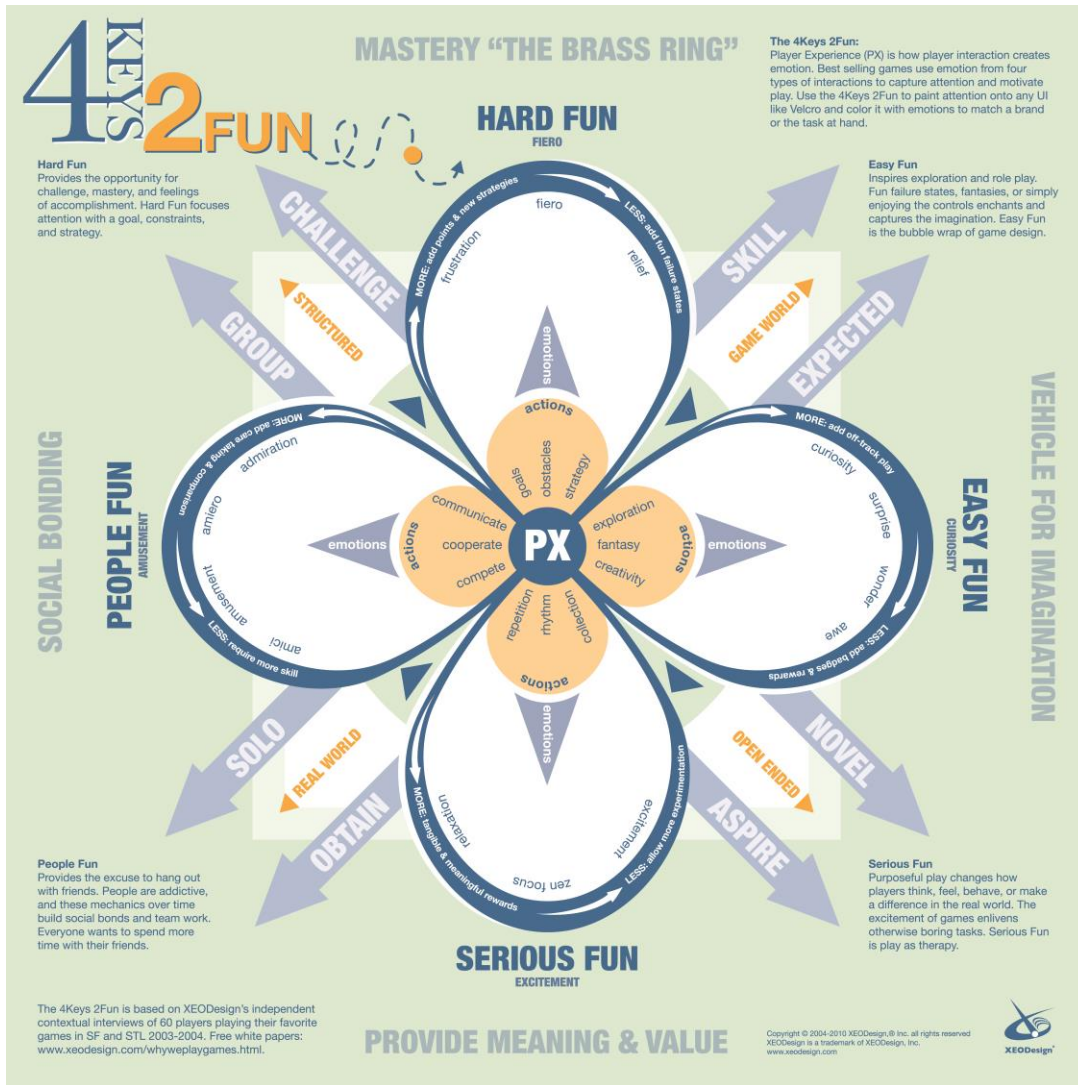
Figure 2, 4 Keys 2 Fun. (Lazzaro, N., 2015) Copyright, 2015

This model defines the four main reasons that people play games. Each key unlocks a

different set of play experiences (Lazzaro, 2015). Lazzaro (2015) suggests that because players

alternate between these types of fun during a single play session, best-selling games offer at

least three of the 4 Keys 2 Fun. Therefore, effective educational applications will include three

out of the four keys to fun to achieve a similar type of variable experience in the learning

process.

These theoretical frameworks give us the tools to design and develop educational gamification to achieve the target goals of innovation, motivation, critical thinking and engagement. However, the extent of design frameworks, begs the question, "Is Gamification in higher-educational environments effective as a design and delivery system of learning experiences?" For this pilot study, the hypotheses proposed are:

H1: Higher education courses developed and deployed using gamification result in courses that are perceived to be more "fun" by students.

H2. Higher education courses developed and deployed using gamification result in high student engagement in course content.

H3. Higher education courses developed and deployed using gamification result in high use of critical thinking skills by students applied to course content.

H4. Higher education courses developed and deployed using gamification result in high student motivation in achieving positive outcomes for course content.

H5. Higher education courses developed and deployed using gamification result in student evaluations suggesting beliefs in course effectiveness and quality.

Methodology

The first question that must be addressed prior to attempts to find answers to the hypotheses is to identify a course that incorporates the Gamification Theoretical Frameworks described here as basic to appropriate development, in order to be considered a good example.

A graduate level course taught in an accelerated MBA program at a predominately Hispanic student-population university in South Texas was reviewed for its incorporation of

gamification techniques. The course has been taught in the online, accelerated format for two years. It is offered six times per year. The program is new so student enrollment in this course varies significantly to the point that some offerings are canceled to meet small class size policy of the university. The class offerings have ranged from as few as five to as many as nineteen students. A total of six class offerings during this time create a data pool sufficient to draw conclusions about characteristics.

Because this is a pilot study, the data collected for analysis is based on accumulated data from this class to compare results from evolving class offerings. Although the course was not originally designed using gamification frameworks, the continuing development of the course led to incorporation of many of the techniques and concepts until it reached the level of content that classifies it as a gamified course.

The course is the capstone course in the degree program. It focuses on strategic management. Students take this course at the end of their programs. Typically, students taking this course have considerable previous experience with other class members so things like team building and team decision-making are met by students with active psychological opinions related to the effectiveness of team activity in previous courses. Such psychological baggage means the course has a challenge to overcome preexisting ideas and feelings to achieve some of its objectives related to teamwork.

The evaluation that establishes this course as using gamification is complex. First, it includes both Macro and Micro gamification elements. For macro, the course incorporates narrative design for meaning and cohesion. Students are told how a business was considered a monopoly and then broken into six units. Each student is assigned to work for a company and

plays a role in its outcomes. As each module progresses, different events happen, including potential labor strikes, modification of economic environment influences, and competition initiating new products. Additionally in Macro, the course modifies student behavior beyond interacting with the gamified environment where the student must determine strategy of managing a company, determining how that strategy will be implemented, and evaluating the outcomes using analysis techniques. As for Micro gamification, the course requires students in roles as managers of their firms to make specific decisions about product design, product price, product production levels, and financial options. These decisions result in market changes when competing organizational decisions are included in industry calculations. The game is up!

The course uses a simulation as its primary learning tool. Although a student is placed in a role, such as Vice President of Research and Development, his or her manipulation of decisions and the processes used are classified as "gaming-informed."

Looking at the Octalysis eight characteristics of gamification we find the course has:

Meaning-It is promoted to students as real-time decision processes directly transferable to management processes in real life and that skill development has a payoff in the student's recognition and success in work environments.

Empowerment-It allows students to make many decisions in different operational functions giving the student complete control over input that results in outcomes directly resulting from the specific decisions made. The simulation unleashes competitive spirit in students that is a major part of the drive to do well in the course.

Social Influence-The management team allows students to create social interactions as they work to reach collaborative decisions for the firm. The design of the decision processes

builds an interdependence among students that pays off in increased exchange and perceived stronger team activity.

Unpredictability-The results from each decision round can be estimated by students, but the outcomes based on input from competing organizations makes actual outcome unpredictable and fosters effort by students to fine tune decision processes to come closer to predicting eventual outcomes.

Avoidance-The program allows students to avoid elements. The student has the power to determine strategy and implementation. They can avoid options that would have significant outcome differences, but still be highly successful for firm outcome.

Scarcity-As with real-life, student teams do not have unlimited resources. Instead, the course requires allocation of scarce resources to accomplish positive outcomes.

Ownership-The outcomes accomplished by the management teams are perceived by students to be their accomplishments. If they score well, students take considerable pride in the results. The competitive spirit drives students to excel in the outcomes to be able to say, "My team did this."

Accomplishment- This characteristic is widespread in the course content. But one element is especially relevant to this gamification resource. After scores are calculated for simulation rounds, they are compared to all other graduate teams worldwide currently using the simulation. A percentile ranking is established for the entire population. This "leaderboard" allows a student to see where they are in the learning process. This semester, one team is currently in the 98th percentile, meaning, they have scored better than 98% of the teams working on the simulation (approximately 1500 word-wide).

Since the course includes all elements for gamification, only one set of characteristics remains to be reviewed. The course's elements of "fun" are very relevant to the courses content for attracting and retaining student access to the course and tenacity to continue until course material is finished.

Evaluating the course on the basis of the four types of fun, the target course includes "Easy Fun" because the format of the course is so novel from what students expect of an online course. The course's decision process allow students to enter decisions that result in failure, such as major loss of profit, having to take an emergency loan, and inventory management that is terribly costly. However, the simulation processes allow students to see the major deficiencies as temporary setbacks they can overcome.

Serious fun is included as students become more engaged as the rounds of the simulation pass. Students begin to interpret the outcomes as purposeful and realistic. When successful, the outcomes create a feeling of "serious fun" as students take pride in the outcomes.

As students get deeper into successful outcomes based on the effectiveness of team decision-making, they begin to relish the social interactions with other team members. Team membership becomes an important accomplishment as relationships between students blossom. This is real "People Fun."

And lastly, the course simulation provides considerable challenge to students to create a feeling of mastery when they accomplish positive results in the round outcomes.

With this evaluation, the classification of the Strategic Management course as one that incorporates gamification is clear. Therefore, it is appropriate to use the outcomes for this course in the test of gamification effectiveness in course design.

Results

Using the Accelerated MBA Strategic Management course as one that classifies as a course built on gamification, data can be collected to provide interpretation of the issues associated with this paper's hypotheses. As a pilot study, these outcomes are relevant to this course alone and may have no basis for generalizability to other courses in other programs, other disciplines, or in other populations.

Specific classification characteristics of this pilot study are:

Course level- Graduate

Course Platform-Fully Online

Course Discipline- Business Administration (Management)

Student population- Hispanic (80%) Caucasian (15%) Asian (3%), Black (2%). (These are estimates based on class enrollments in Strategic Management)

Total students observed. - 75

Instructor Assigned-Same instructor for all course administrations

External Quality- Quality Matters Certified

Course Development- Faculty and Instructional Developers

Data was collected at each offering of the course and aggregated for application to inferences for hypotheses.

Hypothesis 1

H1: Higher education courses developed and deployed using gamification result in courses that are perceived to be more "fun" by students.

To evaluate Hypothesis 1, comments posted on student evaluations by students were classified as positive toward the concept of having "fun." Statements posted did not have to include the word "fun" to be placed in this category. Rather, the tenor of the posted statement is interpreted as related to "fun."

For example, a student posted this:

"Great course! The Capism™ simulation was a great way of learning about the managing of an entire company. I really feel like I learned a lot from this class in the last few weeks. Dr. Xxxxxx is a great professor and would push us to learn rather than complete assignments just for a grade."

A statement like this is interpreted as a surrogate for having had "fun" in the course activities and using the course materials. The accumulated results are shown in Table 1.

	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree
	Class 6	Class 5	Class 4	Class 3	Class 2	Class 1
Number of posts	5	12	5	6	7	11
Percentage of enrollment	55.56%	63.16%	71.43%	66.67%	58.33%	57.89%
					Average	62.17%
N=	9	19	7	9	12	19

Table 1. Number of Statements Revealing the Student Had "Fun" in the course

The result of these unsolicited postings was 62.17% of students posted a statement that was classified a statement indicating that the course and activities were "fun." The hypothesis is confirmed.

Hypothesis 2

H2. Higher education courses developed and deployed using gamification result in high

student engagement in course content.

The second hypothesis focusing on engagement uses the results of peer evaluations for student team activity. The course asked for five peer reviews during the course's duration. The peer evaluations were the responsibility of each student to rate the team activity of all other team members. The peer evaluations are shown in Table 3.

	Class 6	Class 5	Class 4	Class 3	Class 2	Class 1
Number of students with PE of 4.0 or higher	9	19	7	9	12	19
Percentage of students	100%	100%	100%	100%	100%	100%
					Average	100%
N=	9	19	7	9	12	19

Table 3. Peer Evaluations Above 4.0 Out of 5.0 Average for All Items in Survey

The results of this measurement are astounding! Each team member earned an average of greater than 4.0 out a 5.0 possible rating. Team activity is usually a very troublesome point for most courses as students encounter team members who do not engage in the course material. In this case, the results show that the teams comprised members who became engaged and committed the time and effort to earn very positive ratings in the peer evaluations. Hypothesis 2 is confirmed.

Hypothesis 3

H3. Higher education courses developed and deployed using gamification result in high use of critical thinking skills by students applied to course content.

This hypothesis targets high levels of critical thinking applied by students in this course. The measure is the percentage of score the student accomplished out of the total score available in the simulation's individual performance. The course's final exam is individual performance in two areas of activity. First is the simulation and second are the queries from the board of directors. The exam is placed into the context of a story that names the student as the president of the company with responsibility to respond to queries from the company's board of directors. A standard for the measure of student performance of 50th percentile plus is outstanding performance and 35th percentile is the threshold for adequate performance. The results are show in Table 3.

	Class 6	Class 5	Class 4	Class 3	Class 2	Class 1
Percent score on simulation	64%	65%	63%	62%	62%	65%
					Average	64%
N=	9	19	7	9	12	19

Table 3. Percentage of Score on Simulation Performance

The average of 64th percentile for student performance on the individual simulation is outstanding. Keep in mind that the score on the simulation is not interpreted in the normal frequency distribution around a mean of 75 percent. Instead, it is interpreted on the student performance in comparison with everyone taking the individual simulation. The average score of students in this course at 64th percentile is well above the 50th percentile standard, meaning they have scored high on critical thinking in comparison to everyone involved in the simulation. For our purposes here, the comparison is against worldwide student population who are

involved in courses using the simulation, which includes a bulk of the course gamification content described here. Hypothesis 3 is confirmed.

Hypothesis 4

H4. Higher education courses developed and deployed using gamification result in high student motivation in achieving positive outcomes for course content.

This hypothesis turned out to be the most difficult to interpret in the pilot study. To try to interpret motivation among students, the only indicator that was included is the unsolicited posts on the course evaluation. For example, a post such as:

"Great course!!! I really enjoyed the Capsim modules and the competition it created"

Any post that mentioned competition created or application of learning to professional environment was classified as relating to motivation. Since these are unsolicited posts in the evaluation, there is no direct request for students to respond to some construct of motivation in the course engagement. The evaluation of statements made by some of the 75 students in the pilot test population shows 46 percent of students making a positive statement about their motivations for the course. In this case, this result shows some strong motivation, but the measurement does not give an opportunity to make a definitive judgment about the hypothesis. Because most of the statements reflected on the role of the simulation, the influence on student motivation is interpreted as strong. For our purposes, this suggests that Hypothesis 4 is probable, but requires additional, specific construct inclusion in future research to confirm.

Hypothesis 5

H5. Higher education courses developed and deployed using gamification result in

student evaluations suggesting beliefs in course effectiveness and quality.

To evaluate this hypothesis, the end-of-semester student evaluations are used. These

are a series of questions students respond to in an online survey. The response period is a

specific length of time and all students are asked to respond. All classes had 100 percent

response rate from students, except class one, which was short one student response.   The

class numbers are in order from first class to last.

Table 5 shows the results of the student evaluations. Student responses of "Agree" and

"Strongly Agree" are aggregated to determine overall positive satisfaction with the course.

	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree	Agree/Strongly Agree
	Class 6	Class 5	Class 4	Class 3	Cass 2	Class 1
The instructor clearly defined and explained the course objectives and expectations.	89%	100%	100%	100%	100%	100%
The instructor was prepared to teach for each instructional activity.	100%	100%	100%	100%	100%	100%
The instructor communicated information effectively.	100%	100%	100%	100%	100%	100%
The instructor encouraged me to take an active role in my own learning.	100%	100%	100%	100%	100%	100%
The instructor was available either electronically or in person.	100%	100%	100%	100%	100%	100%
N=	9	19	7	9	12	19

Table 5. Students' Evaluations for Strategic Management Class

The data show that student satisfaction with the course is astoundingly high. Therefore,

Hypothesis 5 is confirmed.

Conclusion

This paper addresses the question, "Is Gamification of Course Content Effective?"

After carefully selecting a course that exhibits a plethora of gamification concepts and techniques, this pilot study was able to review evaluation results of an operational course to make interpretations of five hypotheses. Four of the five hypotheses were confirmed. The fifth was determined to be probable until additional research is conducted.

Based on the four confirmed hypotheses and the fifth probable, the conclusion that can be drawn is that gamification of a course is effective as a teaching strategy with a goal of improving course performance by students.

Gamification can be used to change a behavior, increase engagement/motivation, acquire skills and more. Examples of changing a behavior in regards to face-to-face courses would be to improve class attendance and improve student punctuality. For these two examples, microgamification can be used where punctuality and attendance are extrinsically rewarded. It is important however to explain to students the intrinsic value behind this. To increase motivation, one can apply macrogamification and gamify the entire course. Begin with a story line that calls the students to action, is meaningful and related to the discipline, and change the structure of the course to look game-like:

- Instead of structuring the course by Modules/Weeks, change them to levels

- Include narratives within the module to continue the story and include them in the narrative

- Instead of Assignment, call them Fights

- Instead of Exams, identify them as Boss Fight.

- Show character growth (for example begin as an Apprentice and level up until you become a Master)

- Utilize small amounts of extrinsic motivation (ex. show badges for growth, change grading policy to experience points)

Although this pilot study is a snapshot in time to estimate the effectiveness of the course, there are no comparisons to other teaching strategies to determine if there is difference in level of student learning and application. However, the evidence here suggests that the concept of gamification is significant enough to warrant inclusion as a teaching strategy in more courses.

To begin the process of building a course into one that incorporates the concepts of gamification, a framework for organizing development of elements is required. One of the most direct is the Game Design Framework by Werback and Hunter (2012). Although this framework was developed for companies to use to create training for employees and customers, it is directly applicable to education.   The framework includes the following steps:

GAME DESIGN FRAMEWORK

1.   Define business objectives

2.   Delineate target behaviors

3.   Describe your players

4.   Devise activity loops

5.   Don't forget the fun!

6.   Deploy the appropriate tools

 (Werbach & Hunter, 2012)

Our institution is developing an educational gamification framework that incorporates Werbach's & Hunter's framework, along with Quality Matters and best practices found in

literature. The goal will be to develop a process for effective gamification design to achieve effectiveness outcomes.

Future Existing-Course Revisions

In addition to the program that guides development of gamification in new courses, a program designed to improve gamification feel and operation of a course is also in development. The goal is to enrich courses to take advantage of the gamification concepts to improve online course effectiveness in achieving improved Assessments of Learning measures. The update program includes:

1. Explain in Start Here how this course is gamified.

2. Introduce their characters in the Start Here and create a storyline to introduce them to the gamified setting.

3. For each module, incorporate badges for areas of growth. Show growth from Apprentice to Master Businessman. This would incorporate extrinsic motivation and allow students to see growth in character.

4. Incorporate the Storyline in the Simulation to the Blackboard Environment and tailor it to share the challenges/mission to accomplish.

5. As mentioned previously, build a survey instrument to evaluate specific constructs of our hypotheses with questions included in course evaluations to ensure response density for future course modification.

Future Research

This paper lays the groundwork for considerable lines of future research. The ideas that are derived from the paper include:

1. A study comparing gamification course with non-gamification (in this case, a course such as this study's course compared to a course with traditional case-study approach).

2. A study comparing discipline students (this study focused on business students, which should be compared to other disciplines to determine possible differences).

3. A study comparing ethnic populations to determine any socio-economic differences in course effectiveness using gamification (this study is based on results from predominately Hispanic student population in a very low income area of the country).

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Growth of the Open Educational Resource Movement

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Article Abstract

The cost of a textbook for an undergraduate course can average between $60.00 and $300.00. In particular, the cost of textbooks for Hispanic and other minority students can sometimes exceed the cost of their tuition. The increasing cost of commercial texts has led many students to find alternatives for the purchase of their required course text. Students may purchase an older or international version of the text, rent them, or buy e-books. Many students do not purchase the text for the course because they cannot afford the book in any format. The implementation of Open Educational Resources as a means of reducing the cost of student textbooks has grown dramatically in recent years. This paper outlines the development of the OER trend in community colleges in particular and discusses the practical applications for the development of a business law course at Queensborough Community College.

Growth of the Open Educational Resource Movement

In 2002, UNESCO convened a conference to discuss the impact of digital resources. During this meeting, a recommendation was made by Saul Fisher, of the Andrew Mellon Foundation, to utilize the term, "open educational resources," for the availability of course development materials. This led to an era of digital and technology based learning that would revolutionize the horizon of course resources and development. One of the outcomes of the conference was the definition of the term, open educational resources, the following definition was adopted: "The open provision of educational resources, enabled by information and

communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes" [1](UNESCO, 2002, p. 24).

As a follow-up to the UNESCO conference, in 2007, the Institute for the Study of Knowledge Management in Education (ISKME) launched the Creative Commons. The Creative Commons is an online platform designed to provide a forum for the availability of educational resources for use by educational professionals. The Creative Commons created an online environment to allow professionals to network and explore the various teaching modalities available through the platform. Since its creation in 2007, according to the site, they have forged partnerships with over 500 content providers. "As such, ISKME helps schools, colleges, universities, and the organizations that support them expand their capacity to collect and share information and create open knowledge-driven environments focused on learning and success."[2]

The site allows users to search a database of over 40,000 files for texts, videos, lesson plans and other available resources. An individual who utilizes the Creative Commons database can apply for a Creative Commons license which is free. There are a variety of license types available depending on the use of the OER publication by the author. The availability of the material for use is divided in subject areas.

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[1] UNESCO. (2002). *Forum on the impact of open courseware for higher education in Developing countries: Final report*. Retrieved from

www.unesco.org/iiep/eng/focus/opensrc/PDF/OERForumFinalReport.pdf

[2] About Us. (n.d.). Retrieved April 11, 2015, from http://www.iskme.org/about-us

Statistical Data Supporting the Implementation of OER Course Texts

During the 2010-2011 academic year, the Kaleidoscope Open Course Initiative (KOCI), conducted a study of eight community and state colleges. Each school agreed to work together to develop new courses and texts based solely on OER. The study compared students enrolled in courses that used only OER resources, approximately 4,000, and courses with commercial textbooks with an estimated enrollment of almost 11,000 students. "Across the five classes, textbooks cost on average $65.93 per course. There were 1,727 students enrolled in KOCI classes at Cerritos. Those students potentially saved a total of $104,253.57 over the two semesters. There were 4,683 students enrolled in classes similar to those using KOCI texts; however, these classes used traditional textbooks. Those students potentially spent a total of $320,484.59 on textbooks during this same time period."[3] This study demonstrates the drastic financial disparities faced by students who are not afforded the opportunity to utilize OER resources. The study looked at textbooks across a variety of disciplines. Although there were disparities in the cost of the text depending on the discipline, the outcomes of the study were clear. Students who participate in courses that utilize OER resources have the potential to save almost a $1,000 per year. These figures are a clear indication of the need for a wider implementation of these resources at community colleges.

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[3] John Levi, H., T. Jared, R., David, W., & Dale, A. (2014). Cost-savings achieved in two semesters. *The International Review of Research in Open and Distance Learning*, *15*(2), 68-84.

Discipline Specific OER Course Implementation

In the Spring of 2015, the library at Queensborough Community College ("QCC") offered faculty the opportunity to apply for an OER grant. The purpose of the grant was to encourage faculty to develop course specific texts for eventual implementation. The authors of this article received a grant to complete an OER resource for a business law course that all three teach. The desire of the authors to pursue an OER based text for their courses was based on assessment results for the business law course. Assessment results indicated an increasing number of students who did not purchase the text.

An average business law text costs approximately $200 per text. A business law course taught at the community college level typically only covers twelve to fourteen chapters per semester. A majority of the commercial business law texts on the market are meant for a two semester course. The development of an OER text provided a more affordable alternative for our students while delivering a superior educational resource than had been available.

The other impetus for the development of an OER resource was the dynamic and changing landscape of business law. Current trends and online resources provide a more timely and interactive method for teaching business law. For example, a student can learn about the U.S. Court system through a free online interactive web site. In many instances, the articles, documentaries and court cases are more timely in an OER text. The OER resources also provide the opportunity to move beyond the traditional text and explore valuable resources.

Our text utilizes the most current, informative and thought provoking legal resources available and it delivers those resources in a form that enhances retention. The text is divided into three (3) modules and each module provides our students with the necessary reading, video resources, links to pertinent case material and podcast materials to develop their critical thinking and legal reasoning skills. The students would be required to buy the print version of the OER and to use, in conjunction with it, the Blackboard course site which contains the videos, podcasts, powerpoint material and internet links.

The OER Business Law course description is: a brief survey of the American legal system; development and application of essential principles of law as it relates to business contracts, torts, criminal law and intellectual property; a study of recent cases related to each of the topics covered; and the relationship between legality, ethics, and the social responsibility of individuals and businesses within the context of society.

The first module is entitled; "The U.S. Legal System & Historical Trends" which covers the origins and development of the American legal system and provides a concise analysis of the historical events that shaped our society and our laws. The second module is entitled, "Practical Applications of Business Law," a detailed analysis of business ethics and corporate responsibility, the law of criminal law, torts, and intellectual property. The third module is entitled and focuses on "Contracts and Small Business Development."

As an example, we include herewith a description of Module 1 as an example of the format:

Module I – The Magic & Mystery of the Law

1. An Introduction to the Law & The Courts

2. The Process of Litigation and Alternative Dispute Resolution

3. The Landmark Significance of Constitutional Law: "A Living Document for the Ages"

Learning Objectives:

(1) to help students understand the sources of law, nature of legal (2) precedence ("stare decisis") and the classifications of the law;

(3) to promote students' ability to think critically about the litigation process at all levels and alternatives to litigation;

(4) to advance students' understanding of federalism, our system of sharing of power between state and federal government, the supremacy clause, and individual rights and restrictions.

Student Performance Outcomes

An area of concern regarding the use of OER resources is student performance. In 2013, a study was done at a community college in Houston, Texas. The study looked at the use of OER resources in a math course. The researchers determined that there was not a difference in the outcomes of students in the math courses. The authors noted that additional research was needed to determine if differences in student performance could be ascertained in courses where OER resources are used.[4]

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[4] Hilton, J., Gaudet, D., Clark, P., Robinson, T. J., & Wiley, D. (2013). The adoption of open educational resources by one community college math department. *The International Review of Research in Open and Distance Learning*, *14*(4).

It is clear that high schools are moving toward mobile tablets to provide textbooks for their courses. A platform called Net Texts, allows teachers to create a customized digital course. The other advantage to the Net Texts system is that it provides a student access to their course materials from any location. The student does not need internet access as long as they have downloaded the necessary texts.

The variety of student success studies done varies across educational institutions. Tidewater Community College in Virginia launched the Z-Degree program to provide students the chance to save money on tuition while using only OER resources   "It's made a huge difference in terms of retention and success with our students," Williams said "What we have found from the data of a two year pilot study is that we have a reduction in the number of students who drop the course, we find that they withdraw at a lower percentage than the non-Z counterparts, and they have succeeded at a rate equal to or slightly better than the non-Z counterpart classes."[5] It is obvious from the initial data that institutions need to make a concerted effort to promote the development of OER resources to support their students educational development.

Course Design & Assessment

Our OER text has been developed with the intent of making Business Law come alive for our students.   First, we developed an initial table of contents based upon the most current legal topics. The text is a combination of written and video materials in the form of internet

Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1523.
[5] Wood, C. (2015, March 16). Community college proves that schools don't need textbooks. *Center for Digital Education* , Retrieved from http://www.centerdigitaled.com/higher-ed/Community-College-Proves-that-Schools-Dont-Need-Textbooks.html

links. In particular, the use of video resources provides the students the ability to learn using multimedia sources. The course is being assessed and compared to courses where the OER resources have not been implemented to see if there are any differences in retention and grades. This assessment will be done using the Quality Matters rubric.

Conclusion

We believe that it is essential to the success of our students to provide an alternative to the traditional commercial text. The traditional text has proven both ineffective and costly for our students. Many of our students work full–time and attend school. The overwhelming cost of textbooks has become an undue burden for students. We believe that the changing field of technology and OER provides a framework for faculty to develop ways in which to help students succeed.

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Matrícula de estudiantes a distancia en Puerto Rico: Actualización a otoño 2013

Por

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Palabras clave:

"matrícula a distancia", "estudiantes totalmente en línea", "online student enrollment"

Matrícula de estudiantes a distancia en Puerto Rico: Actualización a otoño 2013

Resumen

En este artículo se actualiza a otoño 2013, los datos sobre la matrícula a distancia, las instituciones que ofrecen cursos por esta modalidad y el nivel educativo de estos ofrecimientos. También, se ofrece un estimado del tamaño del mercado de la educación a distancia en Puerto Rico. Al mismo tiempo, esta información se compara con la matrícula a distancia de Puerto Rico por nivel académico y sector educativo para otoño 2012 (Torres-Nazario, 2014). En general, se encontró un aumento de 36% en la matrícula de estudiantes, así como un incremento sustancial en la oferta de cursos a distancia por las instituciones de educación superior (IES) públicas del país. Por último, se estimó que para las 36 IES superior que ofrecieron cursos a distancia en otoño 2013, este segmento de mercado representó poco más de 133 millones de dólares de ingresos por concepto de matrícula y cuotas.

Introducción

Para otoño 2012, un total de 38,571 tomaron al menos un curso a distancia en una de las 34 instituciones de educación superior del país (Torres-Nazario, 2014). Para ese año académico, esta cantidad de estudiantes representaba el 16% de todos los estudiantes universitarios de Puerto Rico. En este artículo se actualizan a otoño 2013, los datos sobre la matrícula a distancia, las instituciones que ofrecen cursos por esta modalidad y el nivel educativo de estos ofrecimientos. También, se ofrece un estimado del tamaño del mercado de la educación a distancia en Puerto Rico. Los siguientes subtemas describen las preguntas de investigación, las variables, una breve descripción del contexto de la educación superior en Puerto Rico y los hallazgos de esta investigación.

Preguntas de investigación

Para este informe, se plantaron las siguientes preguntas de investigación:

1. ¿Cómo compara el número de estudiantes universitarios del país que tomaron cursos a distancia en el otoño de 2012 y 2013?

2. ¿Cómo compara el tipo de institución donde está matriculado el estudiantado de educación superior para 2013?

3. ¿Cuánto ha sido el crecimiento del mercado de los estudiantes a distancia del país de otoño 2012 a otoño 2013?

Definición de variables

Para este estudio, la mayoría de las definiciones relacionadas con las características de los estudiantes y las instituciones, se obtuvieron del glosario de términos de los IPEDS (NCES, s.f.). Entre estas se destacan las siguientes:

1. **Búsqueda de grado o certificado** (degree/certificate seeking) – se refiere a estudiantes matriculados en cursos por crédito conducentes a un grado o certificado o galardón formal reconocido (NCES, s.f.).

2. **Instituciones que otorgan grados** (degree granting institution) – se refiere a un colegio, universidad u otra institución de educación superior que confiere un reconocimiento oficial de la finalización con éxito de un programa de estudios (NCES, s.f.).

3. **Sistema integrado de datos de educación post-secundaria** (Integrated Postsecondary Education Data System-IPEDS) - se refiere al Sistema de recolección de datos post-secundarios que realiza el "National Centere for Educational Statistics (NCES). Todas las IES que tienen un acuerdo con la Oficina de Educación Postsecundaria del Departamento de Educación y que utilizan fondos de Título IV deben proveer información sobre los siguientes componentes: Institutional Characteristics (IC); 12-month Enrollment (E12);Completions (C); Human Resources (HR) composed of Employees by Assigned Position (EAP), Fall Staff (S),and Salaries (SA); Fall Enrollment (EF); Graduation Rates (GRS); Finance (F); and Student Financial Aid (SFA).

4. **Educación a distancia/aprendizaje a distancia** – se refiere a la educación que utiliza una o más tecnologías para ofrecer instrucción a los estudiantes que están separados del

instructor y así apoyar la interacción regular y compartir materiales entre los estudiantes y el instructor de forma sincrónica o asincrónica. Hassenburg (2009, p. 7), la define como "un proceso de educación formal en el que la mayor parte de la instrucción ocurre cuando el estudiante y el instructor no están en el mismo lugar o al mismo tiempo". En este análisis es sinónimo de aprendizaje a distancia, en línea, "online" o educación no presencial.

5. **Estudiantes a distancia** – para este estudio se define como el conteo sencillo de estudiantes que tomaron al menos un curso a distancia en el otoño de 2012 y 2013. El mismo combina los estudiantes que tomaron al menos un curso (también llamados estudiantes híbridos) con aquellos que tomaron exclusivamente o totalmente sus cursos a distancia.

6. **Instituciones de Educación Superior (IES)** – término utilizado en los IPEDS para definir a una institución o escuela que está acreditada a nivel universitario por una agencia o asociación reconocida por el Secretario de Educación de los EE.UU. Estas escuelas ofrecen al menos un año de estudios conducente a un grado y son elegibles para participar de los programas de asistencia financiera de Título IV (NCES, s.f.). Para este estudio se refiere a todas aquellas instituciones de educación superior en Puerto Rico autorizadas por el Consejo de Educación de Puerto Rico (CEPR).

Breve descripción de la matrícula en las instituciones de educación superior del país

Datos recopilados del "Integrated Postsecondary Education Data System-IPEDS" para el otoño 2013 revelan que en Puerto Rico había un total de 81 IES clasificadas como instituciones

que otorgan grados o "degree seeking institucions". Para ese año académico, estas IES tuvieron una matrícula de 239,015 estudiantes (véase Tabla 1). El 88% de estos alumnos estaban matriculados en cursos y programas del nivel subgraduado. De hecho, cuando comparamos el total de estudiantes por nivel educativo, se observó una reducción de 4,209 estudiantes subgraduados para 2013. Aunque esta reducción se compensa con un incremento de 2,942 en estudiantes graduados, en total hubo una reducción de 1,267 estudiantes.

Tabla 1: *Matricula por año y nivel*

Año académico	Subgraduado	Graduado	Total
2012	215,319	24,963	240,282
2013	211,110	27,905	239,015
Diferencia	**-4209**	**2,942**	**1,267**

Fuente: IPEDS

Hallazgos generales

Como se mencionó en la página anterior, para este estudio se utilizó un extracto de los IPEDS de las universidades conducentes a grado en Puerto Rico para otoño 2013. Esta información es la que se utiliza para hacer estimaciones sobre las IES de los EE.UU. Sin embargo, esta información a veces tiene errores de entrada. En este caso, el investigador encontró datos, que a su juicio no se ajustaban a la realidad del escenario del país. El primer caso se relacionaba con los IPEDS de matrícula de la Universidad Central de Bayamón (UCB), que informó que el 100% de todos sus estudiantes, graduados y subgraduados, estaban totalmente a distancia. El investigador estimó su matrícula usando la información suministrada en los IPEDS del año anterior. El segundo caso estuvo relacionado con datos del SUAGM, cuyos IPEDS indican que no tiene estudiantes a distancia en sus tres instituciones (UT, UMET Y UNE).

Para el SUAGM se recopiló información sobre sus estudiantes a distancia por nivel, de los datos publicados en la página 62 del Annual Report (SUAGM, 2014).

A continuación se describen los hallazgos para cada una de las preguntas de investigación que fueron redactas sobre los estudiantes a distancia y las IES que atienden esta matrícula en Puerto Rico. La primera pregunta planteaba lo siguiente: ¿**_Cómo compara el número de estudiantes universitarios del país que tomaron cursos a distancia en el otoño de 2012 y 2013?_** En general, los datos compilados para esta investigación revelaron lo siguiente:

- Al analizar la información de la Tabla 2, se observa que para otoño 2012 había 78 IES que según el extracto de los IPEDS cumplían con el criterio de "degree seeking institutions". Para otoño 2013, este número aumentó a 81, o sea, hay tres instituciones adicionales. Estas son: Dewey University-Carolina Campus, la Escuela de Derecho de la UIPR y la San Juan Bautista School of Medicine, las que no fueron identificadas en el extracto de Otoño 2012 de los IPEDS.

- De las 81 IES, se encontró que 36 ofrecían cursos o programas a distancia a una matrícula total de **165,517 estudiantes.** Al comparar esta información con los datos de otoño 2012, se refleja un incremento de **4,446 estudiantes** matriculados en las IES que ofrecen cursos a distancia (véase Tabla 2).

Tabla 2: *Matrícula de estudiantes por modalidad para otoño 2012 y 2013*

	2012		2013	
	IES con cursos OL (N=34)	IES SIN cursos OL (N=44)	IES con cursos OL (N=36)	IES SIN cursos OL (N=45)
Totalmente en línea (OL)	5,761	-	6,467	-
Al menos un curso (parcial)	32,810	-	46,131	-
Presencial (F2F)	122,500	79,211	112,919	73,498
Matrícula total	**161,071**	**79,211**	**165,517**	**73,498**
Gran total	**240,282**		**239,015**	

Nota: OL = online o a distancia, F2F se refiere a cursos presenciales.

- Los datos reflejan que para otoño 2013 había **52,598 estudiantes universitarios** matriculados total o parcialmente a distancia en una de las 36 IES antes mencionadas. Esto representó **14,027 estudiantes adicionales**, o sea, un incremento del 36% cuando se compara con otoño 2012. Si observamos la Figura 1, entre otoño 2012 y 2013, se encontró una reducción de aproximadamente 10 mil en el total de estudiantes en el número de estudiantes (122,500 vs. 112,919) que tomaron solo cursos presenciales o "*face-to-face*" (F2F) en las IES antes mencionadas. Un desglose completo por institución con su correspondiente número de estudiantes, se incluye en la Tabla 3.

- Por consiguiente, la tasa de estudiantes que toman al menos un curso o que toman todos sus cursos a distancia en otoño 2013 para las 36 IES del país se estimó en 32% de su matrícula total (véase Figura 1). **Pero si incluimos a todas las 81 IES del país, para otoño 2013 la tasa de estudiantes matriculados total o parcialmente a distancia fue de 22%.**
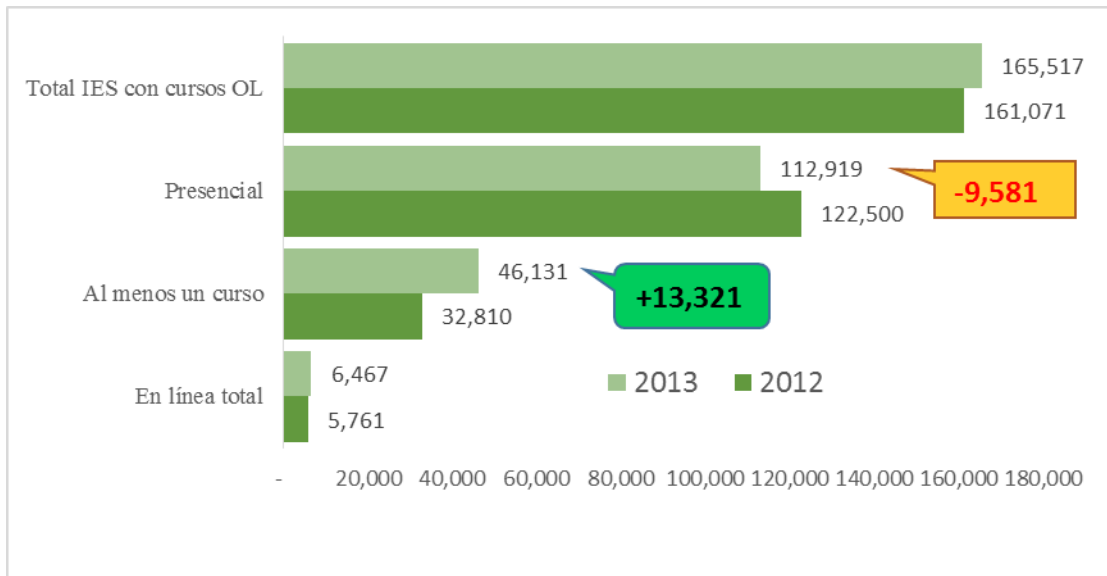
Figura 1: *Matricula total, matricula presencial y a distancia de IES que ofrecen cursos OL para otoño de 2012 y 2013*.

La segunda pregunta de investigación planteaba lo siguiente: **¿Cómo compara el tipo de institución donde está matriculado el estudiantado de educación superior para 2013?** En Puerto Rico, las IES se clasifican siguiendo el tipo de control en una de las siguientes tres categorías: privadas sin fines de lucro, privadas con fines de lucro y privadas (IPEDS, s.f.). En general, los datos revelan que:

- Para otoño 2013, todas las IES con cursos o programas a distancia, ya fueran públicas, privadas con fines de lucro y sin fines de lucro reflejaron aumentos en el total de estudiantes matriculados a distancia. De los **52,598 estudiantes a distancia,** el 70% estaban en instituciones privadas sin fines de lucro (véase figura 2). De estas, el sistema de la Universidad Interamericana, el SUAGM y la Universidad del Sagrado Corazón tienen el 84% de toda la matrícula de estudiantes de las universidades privadas sin fines de lucro del país.
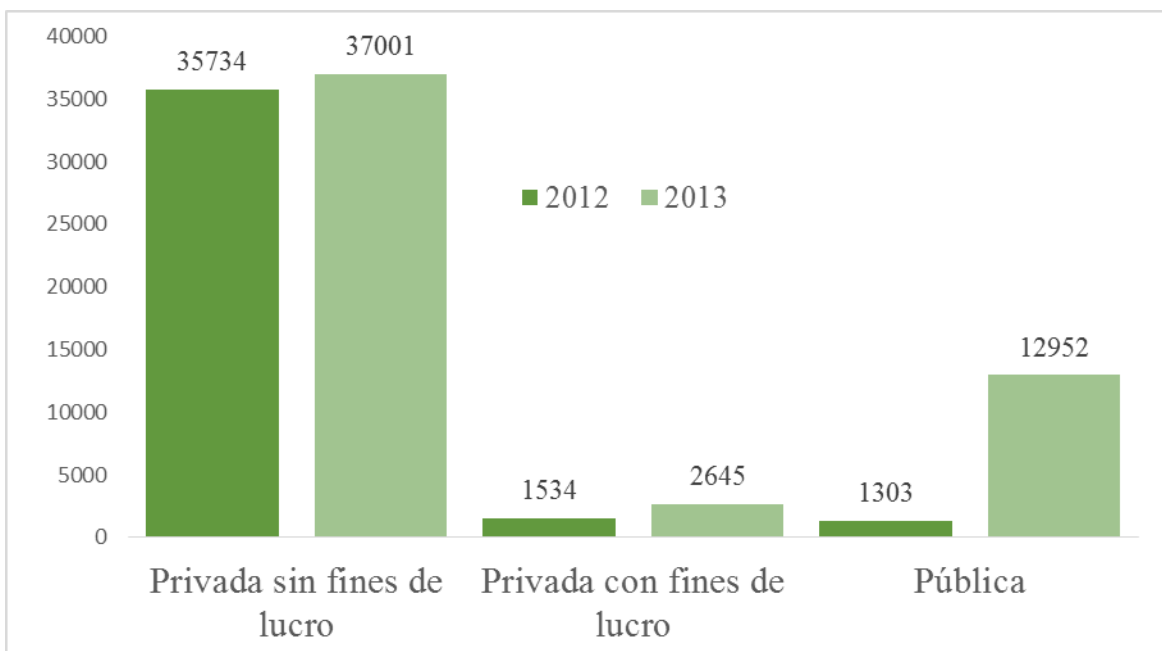
Figura 2: *Matricula de estudiantes a distancia por tipo de institución que ofrecen cursos OL para otoño 2012 y 2013.*

- Cuando se analizan los datos desde la perspectiva del nivel de enseñanza, se encontró que para otoño 2013, **47,271 estudiantes, o el 90%** de todos los estudiantes a distancia, estaban matriculados en cursos de nivel subgraduado (véase Figura 3).

- De todos los estudiantes a distancia, **al menos tres de cada cuatro estaban matriculados en las universidades privadas del país** (véase Tabla 3). De estos, el 68% estaban matriculados en tres instituciones privadas sin fines de lucro del país. Estas eran: El sistema de la UIPR, la Universidad del Sagrado Corazón y el Sistema Universitario Ana G. Méndez (SUAGM). Los datos de esta última institución no fueron informados en los IPEDS de ese año. La información se recopiló del "Annual Report" del SUAGM. En el caso de las IES privadas con fines de lucro, "National University College" era la que más estudiantes a distancia había informado para ese año académico.

- Por otra parte, se encontró que solo 4 universidades públicas del sistema de la Universidad de Puerto Rico (UPR) tenían estudiantes matriculados en cursos a distancia. Para este año académico, se añadió el Recinto de Bayamón a los recintos de Río Piedras, Aguadilla y Mayagüez, como las únicas unidades que ofrecían cursos a distancia en el sistema UPR. Los datos reflejan que de 1,303 estudiantes a distancia en otoño 2012, aumentó a **12,830 para otoño 2013**, un incremento de sobre 800%. La mayoría (88%) de esos alumnos estaban matriculados en el Recinto de Mayagüez (véase Tabla 3).
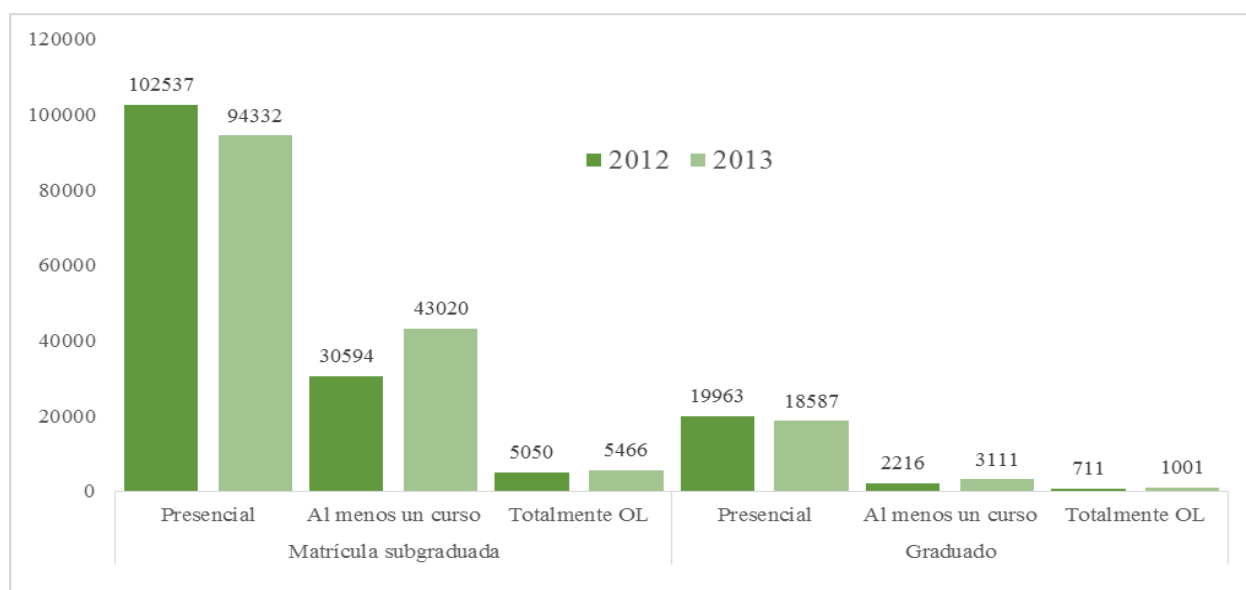
Figura 3: *Matrícula presencial, con al menos un curso y totalmente a distancia por nivel graduado y subgraduado de IES que ofrecen cursos OL para otoño 2012 y 2013*.

Institución	Subgraduado			Graduado			Total		
	Total	Todos los cursos en línea	Al menos un curso	Total	Todos los cursos en línea	Al menos un curso	Total	Todos los cursos en línea	Al menos un curso
Bayamón Central University*	1657	-	475	408	-	73	2065	-	548
Caribbean University System	3932	-	781	904	-	241	4836	-	1022
Carlos Albizu University	142	5	38	777	-	-	919	5	38
EDP University of Puerto Rico Inc	2470	214	818	73	-	-	2543	214	818
Humacao Community College	705	-	705	-	-	-	705	-	705
Inter American University of PR System	36539	2414	21196	5064	477	993	41603	2891	22189
Pontifical Catholic University of PR	8073	91	1637	2755	3	58	10828	94	1695
Sistema Ana G. Méndez*	38346	-	1334	5992	-	626	44338	-	1960
Universidad Adventista de las Antillas	1287	1	183	116	42	7	1403	43	190
Universidad del Sagrado Corazón	5159	546	2744	733	-	15	5892	546	2759
Universidad Politécnica de Puerto Rico	3861	34	800	785	248	202	4646	282	1002
Total privadas sin fines de lucro	**102171**	**3305**	**30711**	**17607**	**770**	**2215**	**119778**	**4075**	**32926**
Columbia Centro Universitario	1680	-	140	143	-	2	1823	-	142
EDIC College	752	-	31	-	-	-	752	-	31
National University College	6648	2068	197	215	202	-	6863	2270	197
U of Phoenix-Puerto Rico Campus	449	-	5	479	-	-	928	-	5
Total privadas con fines de lucro	**9529**	**2068**	**373**	**837**	**202**	**2**	**10366**	**2270**	**375**
University of Puerto Rico-Aguadilla	2973	4	244	-	-	-	2973	4	244
University of Puerto Rico-Bayamon	5075	25	403	-	-	-	5075	25	403
University of Puerto Rico-Mayagüez	10944	1	10407	894	-	894	11838	1	11301
University of Puerto Rico-Rio Piedras	12126	63	882	3361	29	-	15487	92	882
Total sistema público	**31118**	**93**	**11936**	**4255**	**29**	**894**	**35373**	**122**	**12830**
Gran total →	**142818**	**5466**	**43020**	**22699**	**1001**	**3111**	**165517**	**6467**	**46131**

Tabla 3*: Estudiantes totalmente a distancia, con al menos un curso y total de matrícula por tipo de institución y nivel para otoño 2013*.

Fuente: IPEDS Data Center (http://nces.ed.gov/ipeds/datacenter/)

*Nota: Datos del SUAGM se obtuvieron del Informe Anual de SUAGM 2013 y combina UT, UMET y UNE. Los datos de Bayamón Central University indicaban que el 100% de sus estudiantes eran totalmente a distancia, lo que se considera un error. Los datos se estimaron tomando como base los datos informados el año anterior.

La tercera pregunta de investigación planteaba lo siguiente: ***¿Cuánto ha sido el crecimiento del mercado de los estudiantes a distancia del país de otoño 2012 a otoño 2013?*** Los hallazgos para el año 2012 revelaron que los estudiantes a distancia representaban un ingreso estimado de aproximadamente 100 millones de dólares. Estos datos consideran un costo de $170 por crédito subgraduado y $200 por crédito graduado. Además, incluye $150 por semestre por concepto de cuotas. Los estimados para el 2013 utilizan la información sobre el número de estudiantes de los IPEDS recopilada en las secciones anteriores de este documento. Entre estos se destacan los siguientes:

- La proyección de ingresos para el año 2013 por concepto de matrícula y cuotas de los estudiantes a distancia, **se estimó en $133 millones de dólares**. Esto representa $33 millones adicionales a lo estimado para otoño 2012. Es importante destacar que ambos estimados son conservadores ya que para ambos años, se utilizó un costo por crédito de bachillerato a base de $170 y de maestría de $200, así como cuotas por semestre de $150. Para los años antes mencionados, varias de las IES del país tenían costos por crédito y cuotas por semestre mucho más altos a los utilizados en esta estimación (véase Figura 4).

- El desglose por nivel de enseñanza revela que la mayoría de los ingresos provienen de cursos del nivel subgraduado. Por ejemplo, para el año 2013 aproximadamente **121 (91%) de los 133 millones de dólares por concepto ingresos estimados de matrícula y cuotas, corresponden a estudiantes matriculados en cursos de nivel subgraduado**.

- Al estimar los ingresos para todos los estudiantes de las 36 IES con cursos a distancia, se obtiene un estimado de $648, 515,478 por concepto de costo por crédito y cuotas. Por

consiguiente, basándonos en los ingresos estimados previamente, **los estudiantes a distancia representan poco más del 20% del ingreso de estas IES.**
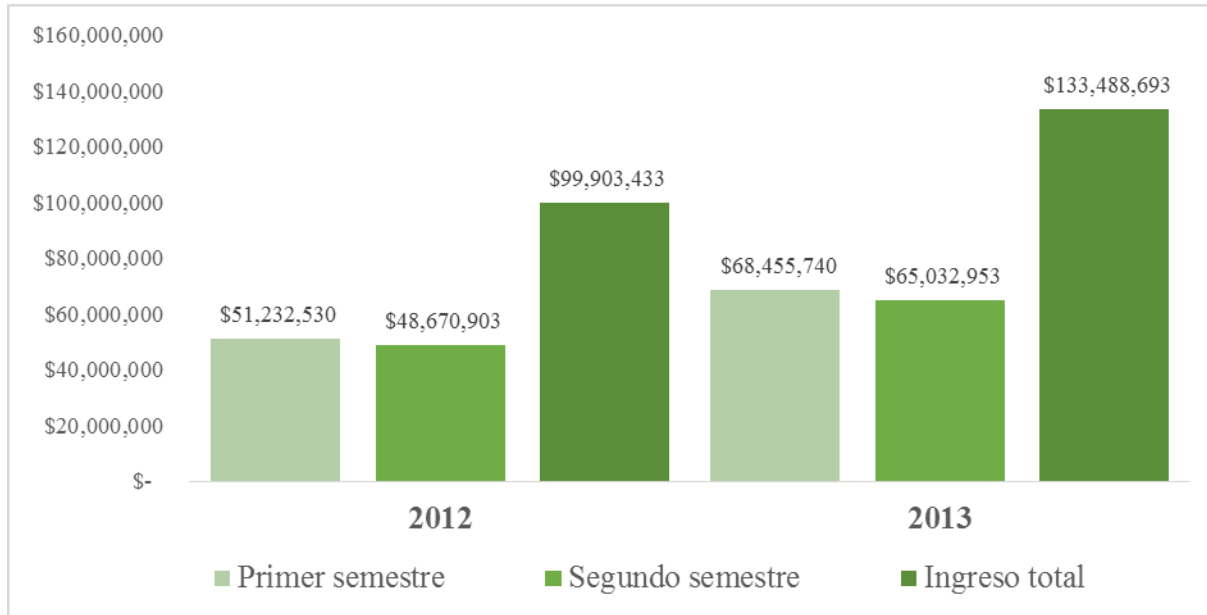
Figura 4: *Ingresos por concepto de matrícula por semestre y año para otoño 2012 y 2013*

Discusión de hallazgos

El propósito de este artículo era identificar la matrícula de estudiantes que toma cursos a distancia en Puerto Rico y comparar sus resultados con un estudio similar realizado para el otoño 2012 por Torres-Nazario (2014). Los datos compilados en las tablas y figuras que acompañan este documento, fueron desglosados por nivel y por tipo de institución. En general, se postulan las siguientes conclusiones:

1. **Para el otoño de 2013, los estudiantes a distancia en Puerto Rico representaban cerca del 22% del total de estudiantes universitarios del país**, **lo que equivale a un incremento del 6% respecto a otoño 2012**. Esta tasa es comparable con la matrícula a distancia de os Estados Unidos, que para ese mismo año era de 25% (Allen y Seaman,

2015). Por otra parte, **si solo consideramos las IES que ofrecen cursos a distancia en el país, la tasa de estudiantes con al menos un curso a distancia aumenta al 32%, lo que representa una proporción importante de la matrícula de estas instituciones.**

2. **Asimismo, se encontró que los estudiantes con matrícula exclusivamente a distancia representan el 4% de la matrícula total de Puerto Rico**. Esta tasa es comparable con los estimados propuestos por Radford (2011) para los estudiantes matricularos totalmente en línea en los Estados Unidos.

3. **La inmensa mayoría de los estudiantes a distancia del país estaban matriculados en cursos del nivel subgraduado en programas de bachillerato o asociado**. Este hallazgo contrasta con la oferta de programas a distancia, por lo que **aparenta haber un desfase entre la oferta y el número de estudiantes que toma al menos un curso en línea en el país (Torres-Nazario, 2014).**

4. **Similar a los hallazgos para otoño 2012, las IES privadas con y sin fines de lucro atienden a la mayoría de los estudiantes a distancia del país (Torres-Nazario, 2014)**. No obstante, otoño 2013 reflejó un crecimiento importante en el número de estudiantes matriculados en cursos a distancia en la universidad del estado.

5. **El estimado en ingresos por concepto de matrícula y cuotas para otoño 2013 sobrepasó los $133 millones de dólares.** Esto representa un incremento de $33 millones de dólares respecto al año anterior, lo que a su vez equivale a poco más del 20% de los ingresos de las IES con ofrecimientos a distancia. **Las IES no pueden ignorar el impacto en términos económicos de este sector de la población universitaria. Por ejemplo, si estimamos un crecimiento anual de al menos un 5% en la matrícula de**

estudiantes a distancia para los próximos 5 años, este segmento puede llegar a representar cerca del 40% de los ingresos por concepto de matrícula y cuotas, de las IES del país.

Limitación de responsabilidad o "Disclaimer"

Las limitaciones de este trabajo se relacionan específicamente con la fase de recolección de los datos del IPEDS Data Center. Es la segunda vez que las IES proveen esta información en los IPEDS, por lo que se observaron inconsistencias en la clasificación de los estudiantes y en los datos que fueron informados.

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Metalectura de textos informativos

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Abstract

Metalectura de textos informativos es un subproyecto del proyecto "Creencias epistemológicas acerca de la naturaleza del conocimiento" patrocinado por la Universidad de Buenos Aires (Argentina) para el período 2004 – 2007. El principio general considera que la lectura pone en juego creencias sobre la naturaleza y límites del saber consideradas como una categoría de pensamiento informal. Estas concepciones influyen en el conocimiento, el razonamiento, las estrategias de estudio, el procesamiento y monitoreo de la información, la organización del contenido y la evaluación de la propia comprensión. La lectura, práctica cognitiva por excelencia, es un factor crítico en los estudios universitarios. Quienes logran leer con provecho se encuentran en una situación privilegiada respecto de quienes poseen en menor grado esta cualidad. Un protocolo de lectura fue diseñado y aplicado a las cohortes 2004- 2005 (n 80) de alumnos de la cátedra Psicología Educacional, correspondiente al tercer año de estudios de la carrera de Educación, Facultad de Filosofía y Letras, Universidad de Buenos Aires. El análisis de los datos permite aceptar la validez de los fundamentos teóricos inspiradores de la experiencia.

Fundamentos

Kitchener y Brenner (1992) distinguen la cognición, construcción o adquisición del conocimiento como el que se produce a través de la lectura, la metacognición, monitoreo de la efectividad de los procesos cognitivos –preguntarse si uno ha aprendido efectivamente algo, revisarlo, ser consciente de los errores que implica el conocer y cuán capaz es uno de conocer

algo– y la cognición epistémica, teoría implícita individual acerca de la medida en que es posible conocer y los criterios que se han utilizado. La conciencia metaconceptual [Vosniadou en Schnotz 2006] es un concepto relacionado.

La metacognición incluye el conocimiento acerca del conocimiento y la regulación

del conocimiento. En la medida en que el individuo es consciente de sus limitaciones puede realizar acciones preventivas para anticiparse a los problemas (Baker y Brown, 1987). La anticipación, planificación o previsión es vista como una habilidad cognitiva de alto nivel en las contribuciones teóricas sobre el tema (Sternberg, 1986) (Kitchener y Brenner, 1992) (Brown y otros, 1984) (Hofer y Pintrich, 1997) (Schommer, 2004).Determinar el grado en que se ha comprendido, estimar las probabilidades para conservar el conocimiento logrado y advertir errores de significado demanda procesos mentales cuya complejidad varía según el grado de experticia del lector y la complejidad del texto. La lectura es una actividad creadora de significado, en tanto el lector elabora una interpretación de lo leído. Incluye reglas de la retórica, manipulación lingüística, recuperación del bagaje experiencial, variables del contexto humano y social de los emisores y los receptores de las producciones y la posibilidad de construir visiones novedosas del mundo o de la realidad (Aventín Fontana, 2005). La metalectura trasciende la comprensión del texto apelando al despliegue de la planificación, monitoreo y evaluación de la acción inteligente, todos ellos procesos metacomponenciales que guían la acción (Sternberg, 1986). Los individuos varían en el grado de conciencia acerca de los límites del conocer. Algunos creen que las cosas son cognoscibles con un alto grado de certidumbre. Otros que el conocer es restringido por la vastedad de lo que puede ser conocido dado que el saber humano es limitado por naturaleza. Estos supuestos cambian entre la

adolescencia y la adultez manifestándose en la aceptación de la incertidumbre. El tránsito hacia formas maduras del pensamiento, del enfoque absolutista al relativista, y las dificultades en estudiantes universitarios fueron señaladas en las investigaciones pioneras de Perry (1970). La comprensión lectora en términos de construcción de esquemas (Brown, 1984) alude a patrones en los que se asimila e integra la información, demanda una reorganización de los que están disponibles y la combinación y creación de nuevos. Las redes informáticas pueden considerarse como provisión de esquemas. La comprensión puede aumentarse mediante la formulación de preguntas apropiadas mientras se lee Kibby (1997). La elaboración interrogativa (Wood y Willoughby, 1995) es una estrategia para facilitar el aprendizaje de prosa y para seleccionar estrategias integrando la información que se posee al responder cuestiones del tipo "por qué" superadoras de la mera repetición. La lectura crítica facilita la apropiación de un adecuado repertorio de habilidades para tratar con el contenido y es un rasgo distintivo de las diferencias en la disponibilidad de estrategias entre expertos y novatos. Las estrategias y el conocimiento previo interactúan. En la medida en que podamos identificar las reglas usadas por los lectores expertos podremos andamiar la habilidad lectora de principiantes o novatos y de lectores pobres. En ausencia de dificultades de comprensión sucede un monitoreo automático (Anderson, 1980) que disminuye la importancia de las experiencias metacognitivas conscientes, que se recuperan cuando surgen obstáculos o bloqueos, escasa familiaridad con el contenido o presentación en un contexto no habitual, que provoca disminución en la velocidad del procesamiento. La relectura cuidadosa, estratégica, selectiva, por párrafos, las interpolaciones, deducciones y búsqueda de ejemplos, lentifican el flujo de lectura. Ausubel (2002) habla de aprendizaje y retención significativos cuando el tratamiento de nueva

información puede anclarse o subsumirse en la estructura cognitiva existente. Sostiene que lo que un individuo sabe o conoce acerca de algo permite predecir los límites de la comprensión.

La lectura es una actividad interactiva, se trate de dialogar con uno mismo (lenguaje interiorizado), con el autor del texto (lenguaje argumentativo), y con otros (aprendizaje colaborativo y recíproco). Cuando los lectores participan en un ambiente discursivo y se involucran en el diálogo, el texto opera como generador y disparador de habilidades, desarrolla la comprensión y orienta los procesos mediante los que el conocimiento se edifica. Esta modalidad se denomina enseñanza recíproca entre el tutor y el lector y entre los pares (Palincsar y Brown, 1984). El pensamiento toma la forma de argumento (Kuhn, 1991) cuando consiste en la justificación de las afirmaciones (Toulmin, 2003). El pensamiento como argumento está implicado en las creencias, los juicios y las conclusiones de las personas. Kuhn se pregunta hasta qué punto somos conscientes de por qué sostenemos una creencia y de la necesidad de justificarla, si sabemos en qué creemos, por qué elegimos entre diferentes ideas y el grado en que apreciamos la evidencia para modificar o abandonar ideas. Razonar de modo argumentativo requiere tomar el propio pensamiento como objeto de estudio, como blanco de reflexión o diálogo interior que permite el control de las creencias personales. Expresiones como "conócete a ti mismo" o "sólo sé que no sé nada" ilustran lo afirmado. Aceptar que afirmar algo no es prueba suficiente de certeza, situar las ideas dentro de lo posible, lo probable y lo opinable convierten al discurso argumentativo en práctica metacognitiva.

La admonición corriente "¡Piensa!", que deposita la responsabilidad en el estudiante cuando comete errores o imprecisiones en los juicios y afirmaciones, cambia cuando el destinatario responde "Está bien, pero dígame cómo" (Nickerson ,1987). La metalectura favorece la

autorregulación del aprendizaje, concepto acuñado por Bandura (1987), capacidad de ejercer dominio sobre las propias acciones en ausencia de limitaciones externas inmediatas. Implica el establecimiento de una meta, la autoevaluación, el autorrefuerzo y la convicción de que se puede realizar con éxito la acción requerida para producir los resultados deseados. La construcción de significados mediante la argumentación en una atmósfera de interacción social que provee guía y retroalimentación favorece el desarrollo del pensamiento crítico y de actitudes facilitadoras. Los roles complementarios en los modelos de aprendizaje colaborativo posibilitan la función de sostén del grupo y pueden servir como medios para combinar y alternar la regulación interpsicológica e intrapsicológica. La autorregulación referida al ambiente consiste en el conjunto de personas que interactúan con el lector. La forma más habitual es la búsqueda de ayuda. Se ha creído que pedir ayuda muestra una actitud dependiente. En la actualidad se considera una actividad adaptativa, capacidad para "utilizar" a los otros como recurso para hacer frente a la ambigüedad y a las dificultades que puedan presentarse, propias del aprendizaje autorregulado (González Fernández, 2001), Según Solomon (2005), supone conciencia de las limitaciones, autoevaluación, actitud proclive a la consulta y selección de estrategias para aprovechar las sugerencias de los otros, esto es una tarea metacognitiva. La autoevaluación de la comprensión se rige por criterios léxicos, sintácticos y semánticos. La semántica se refiere a la cohesión de las relaciones entre proposiciones, la consistencia externa entre el texto y los conocimientos previos del lector y el grado de coherencia entre las distintas partes de un escrito (Baker y Brown ,1984). Una actividad metalectora requiere calibración de la comprensión, grado de asociación entre la predicción de la actuación futura y la ejecución real (Glenberg y otros,1987), [citados por

González Fernández 2001]. Otra medida de la calibración se refiere al sesgo o diferencia entre la actuación estimada y la real que evalúa la dirección o tendencia en el error: exceso de confianza en las propias capacidades a la luz de la actuación o un desempeño. (Schraw y otros, 1993) [Citados por González Fernández op.cit.]

En el área actitudinal se ven comprometidas disposiciones que tienen que ver con las expectativas del lector sobre la lectura del texto, actuar impulsiva versus reflexivamente, adopción de un enfoque superficial, profundo o estratégico, búsqueda de significado, aceptación de la incertidumbre o provisionalidad de las afirmaciones, consideración de puntos de vista alternativos, descentrados, percepción y el manejo de la inconsistencia y la disonancia cognitivas y la flexibilidad para detectar dificultades, escollos y obstáculos

¿Por qué la metalectura?

Un programa de metalectura puede edificarse sobre la base de los fundamentos mencionados. El mejoramiento de la lectura es un objetivo de reconocido valor aplicable a docentes y estudiantes. Permite revisar el contenido de los textos y orientaciones bibliográficas en función de las contribuciones para el pensamiento reflexivo. La puesta en práctica de sesiones de metalectura presenta dificultades originadas en el lector y en las condiciones poco propicias del contexto académico en el que tienen lugar. Las limitaciones del lector se registran como:

• un bagaje experiencial restringido que limita acceder significativamente al contenido e ir más allá de la información dada (Bruner, 1984);

• dificultades para "despegar" de la práctica lectora centrada en el contenido y reparar en las habilidades y procesos cognitivos;

• escasa conciencia sobre la necesidad de mejorar la comprensión lectora;

• concepciones poco realistas del estudiante sobre su capacidad como lector;

• resistencias para admitir que no se ha comprendido o que no se han utilizado estrategias apropiadas;

• insuficiente compromiso con las actividades de comprensión lectora;

• menor dedicación a actividades de enriquecimiento lector que no reciben nota o calificación;

• restricciones para la creación de una atmósfera de aprendizaje colaborativo (escucha mutua atenta) y para la interacción con el docente como tutor o mediador más que trasmisor;

• trabas para identificar y expresar lo que sucede en la mente cuando se lee;

• diferencias en el grado de aceptación de propuestas de enriquecimiento en estudiantes y mediadores Paradójicamente quienes exhiben niveles más maduros y consolidados de comprensión lectora muestran mayor interés;

• lectura reproductiva basada en el aprendizaje por recepción, rutinario o literal;

• extender la lectura mediante la provisión de ilustraciones y ejemplos;

• lectura insuficiente o fragmentaria que conduce a la sobrevaloración de la opinión y/ o al prejuicio de autoridad.

En síntesis, énfasis en los productos más que en los procesos implicados en la lectura.

Un foro de metalectura persigue:

• distinguir niveles de análisis (descriptivo-explicativo) mencionar, distinguir, jerarquizar, interpretar, sintetizar, inferir, integrar, reconstruir;

• utilizar constructos y conceptos organizadores;

• trazar mapas del contenido y conceptuales;

• establecer relaciones, asociaciones, analogías, comparaciones, derivaciones;

• abstraer el propósito de la teoría o del autor;

• distinguir la argumentación lógica y/o empírica de la persuasiva;

• contextualizar el pensamiento del autor apelando a los antecedentes, situaciones, controversias o réplicas de las que surge;

• emplear paráfrasis del tipo "Dígalo con sus propias palabras" o traducir la comunicación en otro tipo de lenguaje;

• identificar falacias, contradicciones o evidencia insuficiente;

• proveer ejemplos, ilustraciones y aplicaciones;

• identificar supuestos implícitos y explícitos;

• plantear preguntas precisando las que tienen respuesta y las que permanecen con menor grado de certidumbre;

• desmembrar el contenido asignando una jerarquía a las proposiciones en una secuencia significativa;

• distinguir el conocimiento declarativo del procedimental (Anderson, 1983);

• elaborar una síntesis de lo leído para organizar la información.

Metacognición y metalectura

Algunas de las habilidades metacognitivas incluidas en la lectura son:

a) clarificación de los propósitos, comprender las exigencias implícitas y explicitas de la tarea;

b) identificación de aspectos importantes del mensaje;

c) centración de la atención en el contenido relevante;

e) auto interrogación para determinar si los objetivos están siendo alcanzados;

f) implementación de acciones correctivas cuando se detectan fallas en la comprensión.

Teorías del monitoreo de la comprensión

Las actividades de monitoreo de la comprensión están explícitamente incorporadas en varios modelos (Collins, Brown y Larkin, 1980) (Goodman, 1976) (Rudell, 1976) (Rumelhart, 1980) (Woods, 1980) [en Baker y Brown 1984]. Consideran la comprensión como un proceso activo de prueba de hipótesis. Los lectores elaboran hipótesis con la información disponible. A medida que se adquiere más información, estas hipótesis pueden ser modificadas o refinadas. La comprensión se dificulta cuando no se dispone de hipótesis orientadoras. Markman (1980) señala la relación entre la comprensión y las expectativas o hipótesis del lector sobre el significado del texto; argumenta que si uno es capaz de confirmar o rechazar sus hipótesis adquiere conocimiento acerca de cuán bien está comprendiendo. El modelo de Rudell (1976) [en Baker y Brown 1984] incluye la evaluación de la adecuación de la información, la recolección de datos, la elaboración de hipótesis, la organización y síntesis de los datos y la prueba de hipótesis. De acuerdo con Goodman (1976) [en Baker y Brown 1984] los lectores deben probar sus hipótesis usando como "cernidores" al significado y a la gramática por medio de frecuentes preguntas formuladas a sí mismos sobre si lo que están leyendo tiene sentido. El lector monitorea sus elecciones de modo tal que pueda reconocer sus errores y recoger pistas adicionales cuando sea necesario. Si se concibe la comprensión como construcción de

esquemas, los investigadores señalan que las fallas en el proceso se originan en tres fuentes principales:

a) Los esquemas apropiados no están disponibles, esto es, el lector no tiene suficiente conocimiento acerca del tema como para poder interpretar el texto.

b) Los esquemas apropiados están disponibles pero el autor no ha provisto suficientes pistas para sugerirlos, esto es, el autor comete una falta al no expresar sus ideas con suficiente claridad.

c) El lector encuentra una interpretación consistente del texto pero no la que el autor tenía en mente, esto es, entiende el texto pero malentiende al autor. Cuando ampliamos el concepto de comprensión de modo que incluya lectura crítica, una cuarta causa puede ser identificada: el lector interpreta el material de la manera deseada por el autor. (Eller, 1967) [en Baker y Brown 1984]. La lectura crítica incluye no sólo imponer sentido al material del modo en que el autor lo pensó, sino ir más allá de la información dada y evaluarla. De esta manera la "buena" comprensión también depende de la toma de conciencia de los autores que escriben con muy variados propósitos y que pueden emplear técnicas de persuasión para inclinar a los lectores hacia un punto de vista. A pesar de que los lectores maduros monitorean su comprensión, este control puede no ser una experiencia consciente. Brown (1984) distingue entre un estado automático y un estado que permite corregir el error o la respuesta inadecuada. En ausencia de dificultades de comprensión, se habla de un piloto automático (Anderson, 1980), que disminuye la importancia de las experiencias metacognitivas conscientes, que aparecen cuando surgen obstáculos o bloqueos en el procesamiento de la información, provocando la disminución en la velocidad , tal como se manifiesta cuando el material es poco familiar o

presentado en un contexto no habitual. La búsqueda deliberada o estratégica y la relectura cuidadosa mediante aproximaciones, deducciones y uso de ejemplos lentifican el flujo de lectura. Un fenómeno importante consiste en darse cuenta cuando una expectativa sobre el texto no se confirma. Otro, cuando se encuentran conceptos poco familiares demasiado a menudo como para seguir tolerando nuestra ignorancia. En cualquiera de los casos reaccionamos aminorando la velocidad de procesamiento, dedicando tiempo y esfuerzo a la tarea de aclarar las fallas de comprensión.

El proceso para reducir la ambigüedad y aumentar la claridad supone búsqueda deliberada, planificada, estratégica, distinta del estado de piloto automático. La caracterización que Whimbey (1975) [en Holyoak 2005] hace de un buen lector subraya el monitoreo de la comprensión: "Un buen lector avanza suave y rápidamente mientras su entendimiento del material es completo, pero tan pronto como siente que no ha captado una idea, que ha perdido el rastro se detiene. Avanza más lentamente para buscar en el material subsiguiente clarificación, lo examina para encontrar la luz que ilumine el punto problemático hallado anteriormente. Si todavía está insatisfecho con su logro, vuelve al punto en el que la dificultad comenzó y lo relee más cuidadosamente. Sondea y analiza frases y oraciones para encontrar su significado exacto, trata de visualizar descripciones abstrusas y a través de una serie de aproximaciones, deducciones y correcciones, traslada términos científicos y técnicos a ejemplos concretos." Las diferencias individuales influyen en el monitoreo exitoso de la comprensión. Algunos estudiantes no quieren admitir, ni aún frente a sí mismos, que no han entendido y frecuentemente no harán preguntas por temor a parecer torpes (Holt, 1964). Características de personalidad como el dogmatismo y la rigidez mental pueden dificultar el monitoreo de la

comprensión. Estos lectores tenderán a saltar a conclusiones sin un cuidadoso análisis previo (Kemp, 1967), (Sullivan, 1968) [en Baker y Brown 1984]. De forma similar, las diferencias de estilos cognitivos pueden influenciar el monitoreo de la comprensión.

Acerca de la lectura interactiva

La lectura es siempre interactiva, pues supone un diálogo con mediadores que tiene lugar con uno mismo a través del lenguaje interiorizado, con el autor del texto en la argumentación y con los pares y tutores en situaciones de intercambio. Leer un texto en una atmósfera compartida es una forma de comunicación de alto valor educativo. Cuando los lectores participan en un ambiente discursivo y se involucran en el diálogo, el aprendizaje no se limita al producto, abarcando el desarrollo de la comprensión y de las habilidades para usar los procesos mediante los cuales el conocimiento se edifica, esto es, apreciando el valor del texto como generador de habilidades. Esta modalidad de lectura ha recibido la denominación de "enseñanza recíproca" entre el tutor-mediador y el lector y entre los pares (Palincsar y Brown, 1984). En la discusión y análisis de textos se alterna entre los participantes la formulación de preguntas, la síntesis y condensación del contenido, la identificación de partes que requieren clarificación y las predicciones sobre el material. La enseñanza recíproca provee guía y retroalimentación mutua en un nivel apropiado. El procedimiento consiste en que por turno, estudiante y tutor guían el diálogo sobre cada segmento del texto. El tutor modela las actividades apropiadas y provee guía y retroalimentación en el nivel que corresponde para cada estudiante. Una secuencia posible consiste en: 1. el tutor asigna el aspecto del pasaje a leer (un párrafo), 2. se lee el segmento indicado en forma silenciosa, 3. el tutor o el estudiante resume

el contenido, discute y clarifica alguna dificultad, formula una pregunta que un maestro o una prueba podrían llegar a proponer sobre el segmento y 4. finalmente se realiza una predicción sobre el contenido de la totalidad del texto. Estas actividades tienen lugar en un diálogo tan natural como sea posible con el tutor y los pares mediante retroalimentación mutua.

Algunas estrategias de lectura metacognitiva

El trabajo centrado en aspectos metacognitivos forma parte de una amplia área de investigación en la búsqueda de técnicas efectivas de estudio. Se centra en indagar lo que los estudiantes hacen durante la lectura para facilitar el aprendizaje a partir del texto. Robinson (1941) [en Baker y Brown 1984] propone la técnica SQR (survey,question, recite, review) que instruye a los estudiantes para que lleven a cabo actividades de reconocimiento (survey) y de planteo de preguntas (question) antes de leer, y sugiere llevar a cabo actividades de recitación (recite), reflexión y repaso (review) después de haber leído. Una de las claves del estudio efectivo es conocer lo que un estudiante hace mientras está procesando el material, tema de interés de la investigación metacognitiva. La concentración mental demanda una especie de atención separada: por una parte necesita centrarse en el material y al mismo tiempo controlar si se están cumpliendo las operaciones mentales que producen los resultados deseados, monitorear los procesos mientras se lee o estudia. Los procedimientos de monitoreo incluyen la capacidad para concentrarse en las ideas principales, introducir deliberadamente alguna táctica para favorecer el aprendizaje y la habilidad para autocontrolar la efectividad de la estrategia usada. El manejo adecuado del tiempo disponible incluye la apreciación de que el contenido es

importante, así como la percepción de que el material no ha sido dominado suficientemente.

Trabajos referidos a los componentes involucrados en las actividades de estudio mencionan:

1) Selección y estudio de las ideas centrales

A menudo se exhorta a los alumnos a concentrarse en las ideas principales mientras estudian; para responder a esta sugerencia deben tener conciencia de cuáles son los puntos salientes del texto, habilidad que se logra gradualmente. Si bien niños de seis años pueden indicar el personaje principal y narrar la secuencia de hechos en una narración simple, tienden a experimentar dificultades cuando deben aislar los elementos centrales en una prosa compleja. Progresivamente se tornan más habilidosos para identificar los rasgos esenciales de organización y los pasajes cruciales del texto (Brown y Smiley, 1977) (Pichert, 1979) [en Baker y Brown 1984]. Los estudiantes de más edad se benefician con el aumento de tiempo de estudio como resultado del conocimiento sobre el modo en que trabaja su memoria y su capacidad para identificar los elementos importantes de un texto, en tanto que los más jóvenes necesitan recurrir a la relectura. Los mayores subrayan o toman notas mientras estudian. Quienes espontáneamente llevan a cabo estas acciones tienden a usar estos recursos para destacar las ideas principales y como resultado de la atención selectiva aumentar el recuerdo en controles subsiguientes. Los lectores eficaces identifican los detalles una vez que están seguros de que las ideas principales han sido comprendidas. Un método para lograrlo consiste en la autoevaluación que permite determinar las particularidades que no han logrado recordar y dedicar atención extra (en los futuros pasos del proceso de estudio) a la información perdida. Los niños de escuela primaria pueden hacer esfuerzos iniciales para controlar como se produce la fijación durante el estudio (Masur, Mc Intyre y Flavell ,1973) [en Baker y Brown 1984 op.cit.]

y los niños con retrasos leves pueden aprender a hacerlo si se les enseña (Brown, Campione y Barclay, 1979). La tarea presenta mayor dificultad cuando el material es complejo. Para tener éxito el lector debe tener, aún cuando sea en forma rudimentaria, autoconocimiento (ser capaz de recordar información), conocimiento de la tarea (evocación literal versus evocación de lo esencial) y del texto (pertinencia versus trivialidad y organización que otorga significado). La coordinación de dichas formas exige un aprendiz sofisticado, coincidente con la afirmación acerca de que la habilidad para leer eficientemente es de aparición tardía.

2) Utilización de la estructura lógica

Otra regla para el estudio efectivo consiste en advertir la estructura inherente al texto. Si el lector encuentra que el material no es suficientemente significativo le resultará difícil retenerlo. Si puede detectar la estructura lógica inherente estará en mejores condiciones para dominarlo. Los trabajos de Brandsford, Stein, Shelton y Owings (1981) muestran que los lectores pobres tienen menor conciencia de las características del texto y de las tareas que deben realizar cuando se lee.

3) Macro-reglas para la comprensión y retención

Un elemento esencial del estudio efectivo es la capacidad para darse cuenta si se está listo para ser evaluado sobre lo leído. Un método comúnmente mencionado es resumir (exposición breve que contiene las ideas esenciales de un pasaje más extenso) el material que se está leyendo. La elaboración de este resumen demanda el despliegue de habilidades cognitivas (Brown y Day, 1983). Estos autores identificaron cinco reglas básicas similares a las macro-reglas propuestas por Van Dijk y Kintsch (1978) [en Holyoak 2005] que se refieren a operaciones mentales incluídas en los procesos de comprender y recordar prosa, esenciales para resumir. Dos reglas

incluyen la omisión del material innecesario. Una consiste en omitir material que es trivial, acción que aún los alumnos de la escuela primaria suelen hacer (Brown y Day, 1983) (Brown, Day y Jones, 1983). La otra consiste en omitir material redundante. Una tercera regla se refiere a proveer un concepto o un suceso abarcador de mayor nivel de abstracción para una serie de ítems o partes. Por ejemplo si un texto presenta una lista como gatos, perros, peces, hamsters y cotorras, uno podría sustituirla por el término "mascotas". Las dos reglas restantes se refieren a la elaboración de un resumen de párrafo, principal unidad constitutiva del texto: primero, localizar la idea principal si la hay. Si no está explícita, elaborarla. En síntesis, las cinco operaciones implican:

1. Omitir lo redundante.

2. Omitir lo trivial.

3. Proveer superordinados.

4. Seleccionar las ideas centrales.

5. Elaborar las ideas principales cuando no aparecen en el texto.

Los expertos hacen uso frecuente de estas operaciones cuando resumen un texto pero ¿en qué grado advierten los lectores menos sofisticados que estas reglas pueden ser aplicadas? Brown y Day (1984), examinaron la capacidad para usar las reglas mientras resumen estudiantes de quinto y de séptimo grado, tercer año de escuela media y de universidad. Utilizaron textos especialmente elaborados que permitían a los investigadores predecir cuándo cada regla debía ser usada o cuándo era aplicada por expertos (profesores de estilo de la lengua en la universidad). Los alumnos de menor edad podían usar las reglas de omisión en un porcentaje superior al 90%, mostrando que comprendían la esencia del resumen: desembarazarse de

material innecesario. En el uso de reglas más complejas aparecieron diferencias de manera muy clara. A medida que aumentaba la edad de los estudiantes, se observó una creciente preferencia por el uso de las reglas, de provisión de superordinados y de selección de la idea principal, evidenciable en el desempeño de los estudiantes universitarios. La regla "elaborar ideas principales cuando no aparecen explícitas en el texto", casi nunca fue usada por los alumnos de quinto grado, sólo en un tercio de los alumnos de tercer año y en la mitad de los estudiantes de universidad. Brown y Day explican las diferencias por el grado creciente de intervención cognitiva que se requiere para aplicar cada regla. La más simple de las reglas, la omisión, sólo exige suprimir información del texto, y la de selección la identificación de ideas principales dentro de un párrafo. La regla de mayor dificultad, elaborar ideas principales, exige que el lector provea un breve resumen en sus propias palabras, esto es, que produzca información más allá de omitir, seleccionar o manipular oraciones existentes. Estos procesos de elaboración son empleados con facilidad por los expertos, resultando dificultosos a los lectores novicios. Las macro-reglas pueden facilitar el estudio. Elaborar un resumen adecuado sirve al estudiante para controlar la comprensión y el recuerdo del material. Existe evidencia de que es más fácil retener un resumen elaborado por el propio estudiante que el proveniente del texto original (Reder y Anderson, 1981) [en Baker y Brown 1984]. No todos los alumnos universitarios están en posesión de estas macro-reglas. Las habilidades lectoras de los estudiantes pueden mejorar mediante la explicitación de las macro-reglas y su utilización regular cuando advierten que el empleo aumenta el rendimiento.

Implicaciones para la enseñanza

• El conocimiento de las dificultades lectoras sensibiliza a los tutores y maestros

para enfrentarlas.

• Las evidencias muestran que se puede habilitar en el uso de las habilidades cognitivas

implicadas en la comprensión de textos aún en los casos de lectores más renuentes.

• Las habilidades lectoras son susceptibles de modificación y mejora durable y generalizable.

Así lo indican la teorización y práctica de la lectura metacognitiva.

• Las intervenciones que incluyen preparación para el autocontrol y la comprensión por parte

de los estudiantes son efectivas cuando están incluidas formalmente en el currículum.

El segundo grupo de procesos involucrados en la metacognición consiste en los mecanismos

autorreguladores usados en la resolución de problemas. Incluyen el control de resultados de los

intentos para resolver el problema, planificación del próximo paso, monitoreo de la efectividad

de la acción, prueba, revisión y evaluación de las estrategias para aprender. Aunque se

disponga de estos recursos no siempre se utilizan. Según Brown (1978) niños de corta edad

pueden llegar a monitorear sus actividades en la resolución de un problema sencillo. Es

probable que aprendices de cualquier edad puedan controlar activamente sus esfuerzos

dirigidos a adquirir conocimiento si se les presentan tareas de nivel intermedio de dificultad (si

la tarea es demasiado fácil o demasiado difícil no demanda el compromiso del yo). El

aprendizaje efectivo requiere un monitoreo continuo de las actividades cognitivas; el ejercicio

poco adecuado o infrecuente puede originar dificultades de lectura. Un modo de tratamiento

de los problemas lectores consiste en la utilización de estrategias compensatorias. Cuando los

lectores tienen conocimiento de sus procesos cognitivos y monitorean la actuación para

detectar los problemas surge la cuestión acerca del tipo de actividad correctiva a introducir para enfrentar el problema, qué tipo de estrategias están disponibles y el grado en que pueden ser implementadas.

La base de conocimiento pertinente para comprender los textos que presuponen un bagaje de experiencias previas aparece como un escollo para la comprensión y una brecha importante entre el lector experto y el principiante. Si el desempeño depende de la aplicación de un conjunto de reglas que pueden ser especificadas, debería ser posible elaborar rutinas de enseñanza. auto-controlando los logros hasta estar listos para ser evaluados (Brown, y otros, 1979). Procedimientos potencialmente útiles consisten en facilitar la disponibilidad de técnicas auto administradas (Andre y Anderson ,1978-9) [en Baker y Brown 1984] la sensibilización hacia la estructura lógica del texto y la significación de ciertos pasajes (Brandsford y otros, 1980). Cuanto más explícita y detallada sea la comprensión del mediador sobre las reglas efectivas para la lectura, en mejores condiciones estará para propiciar la apropiación por parte de los estudiantes.

El uso de la consigna "hacer los resúmenes tan breves como sea posible y omitir la información innecesaria" no resulta una guía suficientemente explícita para los estudiantes de los primeros años de la universidad. Una rutina efectiva fue la especificación de las reglas usadas por los lectores expertos (Brown y Day, 1983).

La importancia del conocimiento de base reside en que si el texto se refiere a temas que no son familiares para el lector, le resultará difícil comprender el significado del material que está leyendo, para poder distinguir lo importante de lo trivial. Una alternativa consiste en seleccionar textos que tratan materiales familiares. Proveer el conocimiento básico que

requiere la lectura de un texto no siempre es factible: aumentar el caudal de información del lector toma tiempo. Una estrategia reside en ubicar lo que uno está leyendo en un marco de referencia provisto por algún conocimiento básico que se posee. Los lectores eficientes lo hacen rutinariamente (Anderson ,1977) para elaborar el significado del texto.

Los facilitadores eficaces llevan a cabo a cuatro actividades principales para ayudar a los alumnos a comprender una lección (Schallert y Kleiman, 1979) [en Baker y Brown 1984 op.cit.]:

1. Adecuan el mensaje al nivel de comprensión del alumno.

2. Continuamente centran la atención del estudiante en los puntos relevantes.

3. Presionan a los estudiantes para monitorear su comprensión haciéndoles preguntas sobre el grado en que entienden el material.

4. Activan los esquemas, esto es, ayudan a los estudiantes a ver el modo en que la nueva información se relaciona con conocimientos que poseen. La conciencia lectora demanda la ejecución de procesos cuya práctica se convierte en rutinas activas de mejora consistentes en: a) Estrategias para leer y recordar. b) Reglas de comprensión de textos. c) Variedad de instrumentos de evaluación que exigen usar el conocimiento de distintas maneras. d) Utilización del conocimiento previo.

Descripción de la experiencia de metalectura

Los docentes universitarios señalan dificultades de los alumnos para la apropiación comprensiva de los materiales de estudio, uso de la memoria rutinaria que conduce a una retención de fácil desvanecimiento, empleo inadecuado de la terminología disciplinar, escasa diferenciación de conceptos generativos, limitada disponibilidad de estrategias para organizar y

secuenciar los materiales de consulta y resistencias para generar actitudes significativas. Indagaciones en las concepciones de los estudiantes acerca de las prácticas de estudio coinciden en que generalmente no se practica la lectura previa o simultánea al desarrollo de los contenidos; la consulta bibliográfica tiene lugar cuando se acercan las evaluaciones.

La cátedra Psicología Educacional perteneciente al tercer año de la carrera de Educación, Facultad de Filosofía y Letras de la Universidad de Buenos Aires en sucesivos cursos elaboró guías de estudio y resolución de problemas a cumplir en encuentros presenciales y mediante tutoría electrónica (Malbrán, 2005). En función de lo esperado, los resultados no fueron suficientemente satisfactorios. Esto determinó que los trabajos prácticos se convirtieran en clases teóricas destinadas a facilitar el acceso a la información, lo que desvirtúa su naturaleza y origina el empleo poco eficiente del escaso tiempo disponible.

La experiencia realizada durante el ciclo 2004 -2005 estuvo destinada al mejoramiento de las habilidades lectoras. Consistió en la realización de un taller y en la construcción y aplicación de un Protocolo de Lectura para orientar la consulta de textos clave durante las clases prácticas mediante el autoinforme y el diálogo con los pares y tutores (profesores de trabajos prácticos y docentes adscriptos). Fue concebida como una iniciativa propedéutica en la que las habilidades puestas en juego pudieran ser transferibles a otros contenidos disciplinares. El tratamiento de los datos es cualitativo. El taller tuvo lugar en la primera de las tres horas de las sesiones en las comisiones de trabajos prácticos, tiempo que estuvo a cargo de graduados adscriptos a la cátedra. La asistencia fue voluntaria. En cada práctico una pareja pedagógica, formada por dos adscriptos, se encargó de orientar la lectura y el análisis de los textos utilizando el protocolo de lectura elaborado por M. del C. Malbrán. Para las tres primeras sesiones se acordó un esquema

de trabajo compartido por las parejas. Luego cada una decidió la modalidad a seguir acorde con las características de las distintas comisiones. En la teorización sobre el aprendizaje pueden aplicarse los fundamentos teórico • metodológicos para el tratamiento de los textos tales como:

• diferenciar los procesos de aprendizaje que postulan distintos sistemas en aspectos convergentes y divergentes;

• atender a la terminología y sus alcances interpretativos;

• disponer en un continuo los modelos según adhieran a una perspectiva centrada en el comportamiento observable o en los procesos implicados;

• explicar el espacio semántico de principios y conceptos;

• proporcionar ejemplos provenientes de la experiencia personal y social;

• discutir, desentrañar los alcances de afirmaciones tales como "El aprendizaje está gobernado por sus consecuencias", "Indáguese lo que un estudiante conoce sobre un tema y podrá predecirse lo que aprenderá en el futuro", "Gran parte de la conducta social se aprende por modelado", "Los resultados del aprendizaje se traducen en capacidades".

Protocolo de lectura

El protocolo de lectura está organizado en tres momentos: planificación, monitoreo y evaluación. Se especifican funciones para cada momento como guía para el tratamiento de los textos.

El primer taller consistió en la presentación del taller y el análisis del protocolo del que se utilizó el metacomponente planificación en el tratamiento de un texto de B.F. Skinner (1969), "Ciencia y conducta humana", a partir del cual surgieron las siguientes preguntas:

¿Qué se entiende por planificar? ¿Planifican la lectura de textos? ¿De qué tipo de textos: académicos, informativos, otros? ¿Qué aspectos se planifican? ¿Cómo se hace?

¿Para qué sirve? Estas preguntas sirvieron para plantear la planificación, de manera de avanzar en la conciencia de las estrategias de anticipación a la lectura. Posteriormente los asistentes en pequeños grupos analizaron cada momento del protocolo cubriendo los tres aspectos. Estrategias propuestas fueron detectar ideas subordinadas, complementarias e ilustrativas, reconocer aspectos poco claros, falacias y aspectos contradictorios y distinguir aspectos empíricos y teóricos del contenido.

En el segundo taller la metodología fue similar. En este caso se trató el metacomponente monitoreo a través del texto de Ausubel (2002), controlando aspectos como la retención significativa de los elementos centrales del contenido, el rescate de materiales almacenados en la memoria de largo plazo y la detección de párrafos para revisar y profundizar.

El tercer taller versó sobre evaluación de la lectura. Se empezó por caracterizar el momento y recuperar aspectos abordados en los talleres previos. El texto objeto consistió en un artículo de Gagné (1977). Los emergentes surgidos tienen que ver con reflexiones sobre el contenido, sugerencias para búsquedas futuras y síntesis de lo leído. La metodología utilizada en los talleres, si bien varió según la modalidad de trabajo de las comisiones, utilizó como marco de referencia las tres dimensiones del protocolo de lectura. Algunos grupos se centraron en los autores, sin descuidar el eje del taller respecto del conocimiento y la reflexión sobre las

habilidades cognitivas puestas en acción. La dinámica de trabajo consistió en el tratamiento de extractos de los textos en subgrupos y luego en plenario para la discusión y argumentación. En otras ocasiones se leyeron fragmentos con mención de las habilidades implicadas y asignación a las partes correspondientes a los apartados del protocolo de lectura. El cotejo de la experiencia relatada por las distintas parejas pedagógicas señala como aspectos coincidentes que los grupos decidieron abordar: en la planificación decidir estrategias de lectura global o por partes, construir claves, usar provechosamente el tiempo e identificar aspectos poco claros. El monitoreo de la lectura se orientó a la adecuación de estrategias, la detección de dificultades y obstáculos para la comprensión y el control de la retención significativa de los aspectos centrales del texto.

En la evaluación de la lectura la construcción y elaboración de nueva información, las dudas y reflexiones que quedan pendientes, la redacción de síntesis cuidando la coherencia y las controversias e interrogantes emergentes.

Espécimen del protocolo de lectura

Planificación de la lectura

1. * Global-por partes

2. * Constructos, conceptos y principios clave

3. Ideas subordinadas, complementarias, ilustrativas

4. Fundamentos y supuestos teóricos y metodológicas

5. Posturas alternativas

6. Información disponible sobre el tema

7. * Aspectos poco claros, contradictorios, falacias

8. Hechos, datos e interpretaciones

9. Distinción entre aspectos empíricos y teóricos

10. *Uso del tiempo

11. Registro y síntesis

Monitoreo de la lectura

1. * Adecuación de las estrategias

2. Retención significativa de los aspectos centrales del texto

3. * Detección de errores y dificultades de comprensión

4. Eficacia de los elementos automatizados

5. * Coherencia del análisis realizado

6. Congruencia de los puntos de vista

7. Rescate de elementos almacenados en la MLP

8. Cambios detectados en las concepciones previas

9. Avances respecto del conocimiento previo

10. Aspectos para revisar y profundizar

11. Paráfrasis, metáforas, analogías útiles para la comprensión del texto

12. Ajuste de la terminología y de las relaciones semánticas

13. Limitaciones de acceso, obstáculos para la comprensión

Evaluación de la lectura

1. * Construcción y elaboración de nueva información

2. Integración del conocimiento logrado al existente

3. Pertinencia de los logros respecto de la planificación de la lectura

4. Limitaciones del conocimiento alcanzado

5. Certidumbre del conocimiento obtenido

6. * Dudas, reflexiones pendientes

7. Aplicabilidad de las ideas

8. Profundidad del conocimiento alcanzado

9. Proyecciones, alcances, búsquedas futuras

10. Habilidades para la comunicación del texto

11. Pericia para la comprensión significativa

12. Acuerdo con el contenido del texto

13. * Síntesis cuidando la coherencia

14. Cambios en las creencias producto de la lectura

15. Abordaje inductivo-deductivo

16. Acuerdos y consensos

17. * Controversias, interrogantes, cuestiones sin respuesta, con respuestas provisionales o con prueba insuficiente

18. Cuestiones abiertas

19. Prueba de lo comprendido

(*) Ítems considerados por los estudiantes como más importantes que permiten construir una versión abreviada.

Conclusiones

Hay coincidencia en los alumnos en señalar que la modalidad de trabajo es interesante y útil si bien llega tarde (tercer año de los estudios). Aconsejan la incorporación en el primer año de la carrera. Hay quienes sostienen, afirmación que no se refleja en las evaluaciones orales y escritas, que no tienen dificultades lectoras que requieran un taller como el realizado. Un aspecto a tener en cuenta es la desviación de la discusión del grupo hacia otros temas como interrogantes sobre la prueba parcial o el trabajo de campo, requisitos obligatorios para aprobar la asignatura. Esto obligó a fijar tiempos breves de discusión de modo de centrar los intercambios en los objetivos. Los alumnos además sostuvieron que no encontraban relación clara entre el taller y las actividades de los trabajos prácticos, lo que aconseja prever una coordinación más cercana o estrecha entre ambas actividades. Se transcriben algunos comentarios: "Las propuestas de las adscriptas fueron útiles para una buena o mejor lectura. Sin embargo, no todas están relacionadas con los conceptos centrales. A esto se suma nuestra falta de lectura previa al taller." "De la fase de planificación me sirvió identificar los constructos, principios y conceptos clave, y el punto 5 en el que se identifican posturas alternativas." "Del monitoreo rescato los aspectos para revisar y profundizar, limitaciones de acceso, obstáculos para la comprensión, cambios en las concepciones previas." "Evaluación: Integración del conocimiento logrado al existente, aplicabilidad de las ideas." "No se cumplió con el objetivo, ya que es muy difícil cambiar un hábito de lectura automatizado." "Metodología un tanto confusa." "No se leía el texto con anticipación (incluso no se contaba previamente con él, dado que todavía no estaba en la fotocopiadora)." "Demasiado ambicioso pretender que se tengan los textos leídos previamente para los estudiantes que trabajan." "Se podrían haber organizado

los textos de una forma diferente ante la falta de lectura por escasez de tiempo; Ejemplo: leer un capítulo por grupo para la clase siguiente, es decir, leer menos cantidad." "Falta de bibliografía sobre metalectura.". Con respecto al protocolo, la mayoría de los estudiantes acordaron en que son muchos ítems, no todos útiles y lleva mucho tiempo completarlos.

Orientaciones para la discusión y argumentación

La formulación de preguntas. Algunos ejemplos

Propósito: Activar el conocimiento y planificar la lectura

• ¿En qué reparar o a qué atender?

• ¿Cómo interpretar…?

• ¿Qué cuestiones pueden autoformularse?

• ¿Cuáles son las expectativas sobre la lectura del texto?

• ¿Qué puede esperarse en términos de cambios en el conocimiento y actitudes?

• ¿Cómo debería organizarse mentalmente la información?

• ¿Cuál es el valor o utilidad del texto?

• ¿En qué grado el texto contribuye para futuras lecturas-consultas ?

• ¿Qué vinculaciones pueden establecerse con aspectos teóricos-prácticos históricos-cotidianos-otras teorías?

• ¿Qué se tiene en mente y por qué?

• ¿Qué analogías, ejemplos de la vida cotidiana, experiencias pueden ilustrar/aclarar…?

• ¿Cuáles son las dudas, confusiones, incertidumbres sobre el significado?

• ¿Cómo usar el conocimiento activado?

• ¿Qué estrategias de discusión y análisis se utilizaron?

• ¿Cuáles son los pasajes del texto claros-significativos-contradictorios-confusos -dudosos-rebatibles-discutibles-fundamentados-orientadores-persuasivos?

• ¿Qué aspectos deberían ser retenidos y a través de qué medios?

• ¿Cómo realizar una lectura creativa?

Procedimientos

• Reformular-parafrasear en términos más simples, corrientes, etc.

• Revisar, ir hacia atrás, para establecer relaciones.

• Releer secciones precedentes para mejorar la comprensión.

• Adelantar en la lectura para aclarar dudas de comprensión.

• Usar el contexto para otorgar significado a un término desconocido, utilizado en una acepción poco corriente, propio del autor o del marco teórico.

• Identificar la información según su grado de importancia.

• Jerarquizar el contenido para la construcción de un "borrador mental".

• Resumir, sintetizar y organizar el material.

• Volver a examinar el texto para retener las ideas principales.

• Determinar subtemas.

• Seleccionar técnicas de memorización y recuerdo.

• Buscar el sentido.

Desarrollos futuros

La incrementada disponibilidad de medios electrónicos (email, Internet, redes sociales, blogs, teleconferencias, foros virtuales, simuladores y videos online, tablets, pc, y dispositivos móviles, plataformas Moodle) por parte de docentes y alumnos universitarios respecto de la fecha en que se realizó la experiencia y el aumento de sistemas semipresenciales y a distancia incorporados en las universidades argentinas, permite diseñar un programa de metalectura de textos informativos que aproveche las posibilidades que brindan las TIC´s. El programa permitiría abarcar una audiencia ampliada y extender los contenidos disciplinares.

Ámbito

La Universidad de Buenos Aires (UBA) requiere de los futuros ingresantes la aprobación de un Ciclo Básico Común (CBC) con un año de duración previo a los estudios de grado. El ciclo incluye asignaturas comunes y otras según la carrera de interés de los inscriptos. Opiniones vertidas por los docentes y por los estudiantes coinciden en señalar dificultades para la comprensión lectora y para la resolución de problemas provenientes de diferencias en la cantidad y calidad de la información que poseen, que se atribuye, al menos en parte, a la oferta educativa de la escuela media de procedencia.

La matrícula del CBC es muy numerosa (del orden de los 50.000 por año en descenso). Los índices de desaprobación 36 %, variables según la carrera (50% en carreras científicas a 5% en humanísticas) y los índices de deserción altos (40%).

Los estudiantes poseen recursos informáticos personales o provistos por la universidad.

El programa digital de metalectura en una primera fase comprendería las asignaturas o cursos comunes (Introducción al pensamiento científico y Sociedad y estado) que arrojaría datos relativos a la confiabilidad y validez de contenido.

Recursos

Tutoría y consultoría electrónica durante todo el programa dirigida a la interpretación de las consignas de trabajo , el cumplimiento de los tiempos asignados y la detección de baches y errores durante el trayecto.

Mensajería y foros virtuales para intercambiar opiniones, despejar dudas y enfrentar obstáculos. Cooperación entre pares y aprendizaje colaborativo.

Lista de discusión dirigida al intercambio de ideas y procedimientos que permita obtener feedback entre los docentes y alumnos y entre los pares..

Creación de un sitio Web para almacenar documentos, procedimientos y productos disponible en forma permanente, enriquecido por búsquedas y aportes de profesores y alumnos. Estimulación de la participación activa.

Lectura en medios digitales que complemente y aún reemplace la lectura en formato papel. Aprendizaje virtual y transferencia de habilidades e información.

Teléfonos celulares que dinamizan la consulta continua en espacio y tiempo.

Empleo del correo electrónico y del sitio Web para el envío de pantallas, informes y ensayos que estimulan la familiaridad con el sitio y la evaluación formativa y sumativa a través del conocimiento inmediato de los resultados.

El programa se desarrollará en tres etapas: 1.- familiarización de los estudiantes con el uso de la plataforma. Creación de cuenta de usuario, video tutorial sobre el uso de la plataforma y

participación en el foro de bienvenida; 2.- descarga de contenidos, cumplimiento de tareas virtuales, utilización de espacios de entrega, participación en foros de los módulos y uso de la mensajería interna; 3.- incorporación de herramientas de trabajo colaborativo (wikis, prezi, blogs) a través de la plataforma y realización del trabajo final integrador.

La consulta de los estudiantes al perfil personal de usuario les permitirá administrar: calificaciones, contactos con pares y docentes; analítica del desempeño parcial y global y feedback de los docentes.

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Structuring Online & Hybrid College Courses

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Structuring Online & Hybrid College Courses

The world of education is rapidly changing as we move onward in the digital world. From pre-school to graduate school more instruction utilizes multimedia and digital resources and relies less on the printed word. Toddlers are playing games on iPads, kindergarteners are drawing and creating stories using laptops, middle school students are conducting online computer research, and college students are producing and submitting digital stories instead of research papers. Advantages of the increase in educational technology include education becoming more accessible, affordable, adaptable, and equitable (Bai & Smith, 2010). We have Ebooks and libraries that offer varied digitalized material and even a library with no books! The first bookless library recently opened at Florida Polytechnic University in central Florida. One of the attributes of such a library is that students can research and select material independently which often is easier and more productive than seeking assistance at a library's help desk. Support from librarians is still available, if needed.

Working independently. . . Conducting research. . . Using investigative and critical thinking skills. . . These are the same cognitive components that most educators stress in their curriculum however, the way in which courses are structured is quite varied as are the rates of success. In spite of all the advances in technology-based education there still is reluctance on the part of some educators, especially in higher education, to use multimedia and technological resources. Nowadays, use of such material is generally expected by students, but they frequently are either not utilized in college settings, used minimally, or inappropriately. Many college professors expect learning to take place via students: listening attentively to classroom

lectures, taking copious notes, and religiously reading, and if needed, re-reading, their textbooks. A more contemporary approach to teaching recognizes that such a limited strategy may no longer be exclusively workable.

Characteristics of Contemporary Educational Institutions

Educational institutions are now very diverse by race, ethnicity, gender, age, and socioeconomic status, and we have an increasing number of students who have recently immigrated to the United States. This makes instruction and learning even more complex since native language and culture may interfere with the educational process. For example, the institution where I teach, LaGuardia Community College of the City University of New York, is located in Queens, NY, which is one of the most diverse areas of the nation. Our institutional profile (2014) reveals that one-half of our 20,000 students come from 157 countries and speak 111 native languages. Over 60 percent of students receive some type of financial aid and 40 percent are employed, at least part-time. This means that one class may consist of students from a dozen different countries, single parents, returning veterans, local business owners, recent high school graduates, re-entry felons, graduates and professionals from foreign universities, and high school drop outs with a GED. As one might surmise, teaching at such an urban campus is demanding and as the United States becomes even more diverse, these challenges will only increase, especially for community colleges where many students initiate their academic careers.

One of the complicated tasks all colleges face today is how to effectively deliver the ever increasing number of hybrid and online courses expected by students from all types of

institutions of higher education; from two-year colleges to graduate schools, and even doctoral programs. The hybrid or blended model consists of face-to-face instruction, plus time devoted for students to work independently while using instructional technology. This structure varies by type of course and educational institution, in addition to the amount of time in each setting, e.g. two hours of class time and one hour of online work per week, or one-half face-to-face contact and the other half online, etc. In some colleges, students meet with their instructors at the first and last class meetings and the rest of the time is spent online. An overall goal of hybrid learning is to combine best practices of the face-to-face classroom experience with the online tools needed to create a virtual classroom (Rausch & Crawford, 2012). Strictly online courses are just that; all instruction takes place online.

Hybrid and Online Instruction

Some of the advantages of hybrid and online instruction include: alternative ways of creating interesting and active learning using technology, opportunities for students to engage in self-directed learning with added flexibility (Wichadee, 2013), a high level of engagement that typically occurs in a virtual environment, the degree of comfort students feel with a well-designed hybrid/online course (Rausch & Crawford, 2012), and the amount of instructor/student interaction which contributes to course satisfaction (Martyn, 2003).

In addition, institutions such as Rutgers University, found that "hybrid instruction allows students to benefit from the strengths of both face-to-face and online instruction and when properly developed and implemented, hybrid courses in many cases allow for greater interaction between instructor and student, and greater interaction and collaboration between

students than is possible in a traditional face-to-face course" (Rutgers University Senate Report and Recommendations on Hybrid Courses, 2009). Regarding retention in hybrid and online environments, there is evidence that a sense of community is significantly associated with perceived learning (Rausch & Crawford, 2012) and student satisfaction was the highest of three modes of learning tested (face-to-face, fully online, and hybrid) and test scores were the same for all three methods of delivery (Wichadee, 2013).

Based on feedback from the hybrid courses I teach, students tend to like the format of the course (two hours face-to-face and one hour computer-based), the active learning modality, and the flexibility the course offers. In addition to the beneficial aspects of a hybrid class such as: greater instructor/student interaction, implementation of active learning strategies, experiential learning, etc., less in-class time is valuable to many students. One or two hours a week not needing to travel to class may not seem like very much time to savor, but for students who are working, have childcare or family responsibilities, and use public transportation or travel long distances, one to two hours of class time translates to three or four hours when you consider travel time. Plus there is the cost of transportation which can be expensive especially for lower income students.

Strategies for Structuring Online & Hybrid Courses

The following strategies are designed to effectively structure hybrid or online classes keeping in mind pedagogy that will complement course goals and increase student success. I have found them to be useful when designing courses for a virtual environment.

1. Create pre-course requirements; number of credits needed or a certain GPA, in order to enroll in a hybrid/online course. Many colleges require at least a 2.0 GPA and at least one semester of traditional courses before enrolling in a hybrid or online one. This gives students the opportunity to first gain some traditional college experience. Endorsement of this requirement is supported by a study of 320 college students taking an online course at Kentucky Community & Technical College, final course grade served as the dependent variable. The results of the analysis indicated that only cumulative GPA was a significant predictor, explaining approximately 40% of the variance of the final grade. Although differences in final grades were present among the variables age and ethnicity, these differences disappeared when controlling for cumulative GPA, (Bruce et al, 2012).

2. Encourage the use of a pre-enrollment assessment that taps into students' motivation and ability to be successful in a hybrid/online class. Such an assessment will determine students' readiness for a blended or online class and make them aware that these types of courses are not easier than face-to-face courses. In fact, many are more difficult. You can find many different types of free assessments online or one may be available at the institution where you teach. One example of an online readiness quiz can be found at the website of Sierra College listed in *Teaching Online* (Ko & Rossen, 2010) at, http://lrc.sierracollege.edu/dl/survey/OL-student-assess.html

3. Determine what technological resources students must have in order to be successful in the course you are teaching. This is very important because students may not have an updated computer or software to manage course requirements. Since not all students have computers at home, determine where students can borrow or use them such as

school computer labs or neighborhood public libraries. Each institution is different; therefore, check the availability of your college's instructional technology facilities.

4. Regularly check on students' progress and communicate with them. Students can easily get lost in the virtual world so regular emails, reminders, course postings, etc. will help students stay on track. You may also wish to consider using Facebook, instant messaging, and/or texting (separate from personal accounts) to keep in regular contact with them.

5. Determine a realistic and clear timeframe for assignments, grading, and email replies. This can be stated in the syllabus so students are aware of when they will receive feedback. A guide containing elements of good syllabus construction can be found at, www2.honolulu.hawaii.edu/facdev/guidebk/online/web-elem.htm (Madden, 2011, Honolulu Community College). Also, decide which assessments will be completed online and which ones will be completed in class. In my hybrid course, student's complete assignments and quizzes online and midterms and finals are given in class. Their written tasks, including papers, are uploaded to the course website.

6. Use creative assignments and real-world examples to keep students interested. Students tend to be much more engaged when they are working on projects or assignments they find relevant and challenging. Make sure you have goals and objectives, not only for the course itself, but for all the assignments, and that they are appropriately connected to course content. This will help you organize course requirements and help students understand why they are completing specific tasks. As noted by Ko & Rossen (2010), the use of a recent version of Bloom's Taxonomy, a

hierarchy of different levels of thinking, can be of great assistance in formulating learning objectives and can be found at www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm.

7. Determine if the virtual components will be completed asynchronously or synchronously. There is value in doing both. By having all students virtually present with you at the same time, activities can be fast paced and engaging. Students completing work on their own time allows them (and you) more flexibility. Structuring assignments asynchronously is not as complicated; therefore, you may wish to start there. Make sure students are aware of where they can go for technical/computer assistance, if needed, especially if there is a synchronous component. Remember that synchronous components require full attendance of all course participants who may or may not be in the same time zone (Globokar, 2010).

8. Decide how students will collaborate with one another. This can be tricky since some students do not like team work or giving feedback to one another, however; collaboration is an important component of the learning process, especially in a hybrid or online environment. Rausch & Crawford (2012) stress the importance of community, and even though students may not know one another, group projects should be designed so learners will work as a collaborative team. Churches (2011) emphasize collaboration even further by stating that "working with peers is a critical motivator for students."

9. Maintain contact which will help students feel connected to the class. One way of initiating this is to have students introduce themselves online at a "discussion" site,

early on in the course. You can then require students to comment by responding to at least two student postings. This provides you with information about each student and encourages them to communicate with one another. I always acquire all types of information about students when they form a long chain of correspondence. I'm also generally amazed at the quality of feedback many students provide one another.

10. Provide support and encourage students to ask questions and to seek help, if needed. You can set up virtual office hours in addition to face-to-face meetings. This makes it easier for students who have difficulty seeing you during regular office hours.

11. Repeat instructions for assignments, activities, quizzes, etc. This may be needed for some students especially if they have challenges learning. Also, a hybrid course, like traditional ones, should meet all requirements for students with disabilities.

12. Maintain high yet realistic expectations making sure the course is not too hard or too easy. If you include online assessments, decide what type of feedback students will be given. For example, when students first take a quiz online in one of my hybrid courses, they are only told their score. After all students complete the quiz, they are then given the correct answers. This prevents students from sharing the correct answers with others before they take the quiz themselves.

13. Don't "pile on" assignments because it is a hybrid or online course. There is a tendency to do this since face-to-face time is limited or non-existent. Remember, if you pile on the work for students you are also increasing your own work since you need to grade all the assignments in a timely manner. Just like you don't want your students to feel

overwhelmed, you don't want to create the same dilemma for yourself. I know this from experience!

14. Allow students sufficient time to complete online assignments. This will help students keep pace with course requirements and increase chances of success and retention.

Some professors may have already implemented some of the above-mentioned suggestions, however, the intent here is to be as inclusive as possible for instructors who may be just beginning to design their hybrid or online course and are uncertain as to where to begin. I found this to be the case in the seminars I have taught over the past few years.

Common Misconceptions about Online & Hybrid Teaching

Some college instructors are reluctant to even ponder the idea of offering a hybrid or online class and find themselves victim to one or more of the following common misconceptions:

(1)Hybrid/online courses are inferior in terms of both quality and quantity of learning. This is a myth since the quality of education students receive in non-traditional courses is at least equal to what they receive in traditional ones. As mentioned previously, a study done at Rutgers University found the hybrid format pedagogically sound and appealing to many students. Add more citations. The sentiment of some professors is they don't think students can learn as well if instructors are not present in the classroom all the time. This may go back to "old school" thinking where only the exalted professor can impart knowledge to passive students. Nowadays, many educators recognize that there are other components of teaching that are equally important such as inquiry-based activities, debates, independent research,

group work, and use of multimedia resources. Students today learn differently—they multitask, find information instantly using technology, and frequently don't even take notes. I became cognizant of this the first time I saw students taking pictures of what I had written on the board. One student said, why take notes when you can snap a picture with a smart phone! When students have the opportunity to work independently on meaningful tasks with guidance, they become excited about learning and feel empowered. This is what college is all about and it can take place in both traditional and non-traditional settings.

(2) A hybrid or non-traditional course takes a great deal of effort to create. Actually there is some truth to this statement. Initially, preparation does require a lot of work and time, however, after teaching the course a few times, it becomes more manageable and the end result is worth the effort. Think back to the first time you taught a college course. How much time did it take to prepare? How smoothly did it go? I doubt any instructor would say it was easy as pie! Subsequently, we all learned the importance of good course preparation and organization which is also true for structuring a hybrid/online course.

(3) The failure rate is high. If a course is not structured properly and appropriate course prerequisites put in place, the failure rate could indeed be higher than in traditional courses. However, this is not always true. For example, at the college where I teach, a study was recently done looking at the pass/fail rate of hybrid/online courses versus those strictly face-to-face for the same courses and the outcomes were similar. It should be noted that we do have prerequisites in place that could affect the pass rate and we offer extensive faculty support in the creation of non-traditional courses. In the research project mentioned above at

Rutgers Graduate School of Education, a 300-level course in Educational Psychology met for 8 weeks face-to-face and then half the students went to a hybrid model while half continued face-to-face. Students who had been working at an above average level got even better in the hybrid environment, however; students who had been working at a below average level did worse in a hybrid environment (Rutgers, 2009). Hybrid courses may not be for everyone, but for those motivated to teach or take one, the experience can be rewarding, meaningful, and educationally sound.

How Students Learn

Some of us may remember the college courses we took as students about the process of learning and different ways people learn. If we reflect on our own dominant learning style we may become aware that our students may learn differently. One of the advantages of using multimedia resources and computer-based technology, whether the course is hybrid, online, or face-to-face, is that they can be utilized to tap into different learning modalities. By requiring the use of: reading material, websites to investigate, videos, documentaries, group and experiential activities, and reflection, all styles of learning are addressed—combinations of visual/verbal, auditory, and kinesthetic/tactile. According to the University of Illinois Online Network (2011), the online environment can be particularly well suited for students with varying learning styles and those who do not approach learning in a systematic or linear fashion. They note that because of this, online educators should design activities that address different modes of learning for the benefit of a wide array of learning preferences especially the most common: (1) Visual/Verbal who prefers to read information; (2) Visual/Nonverbal who

uses graphics or diagrams to represent information; (3) Auditory/Verbal who prefers to listen to information; and (4) Tactile/Kinesthetic who prefers physical hands-on experiences. By utilizing multiple instructional strategies that reflect different channels of perception (seeing, hearing, touching/moving), the learning needs of most students will be more fully addressed (University of Illinois Online Network).

There are learning style inventories that instructors can give to students to help them understand the best ways they learn, along with lists of the characteristics of learning styles. Both types of inventories are available free at numerous online educational websites.

The Learning Process

So, what exactly is learning? As Mayer (2002) points out, learning is a process that leads to change as the result of experience. He notes how students interpret and respond to experiences is crucial since learning is not something we DO to students but rather something they do to themselves.

Seven principles of good instructional practice by Checkering and Gamson is a useful rubric for evaluating effective **online** instruction. This study focused on whether the use of instructional strategies as measured by the seven principles had an effect on student attrition rates in **online courses**. Full and part-time faculty at three community **colleges** in Virginia who taught **online course**(s) in the last three semesters completed an **online** survey to determine the extent to which they used instructional strategies reflecting the constructivist-based seven principles in their **online courses**. Scores from the survey were then compared to the attrition

rates in their **courses**. Results indicated both groups strongly used instructional strategies reflecting the seven principles of good practice in their **online courses** with full-time faculty scores ranging a bit higher. A moderate relation was found with the third principle, "encourage active learning." This indicated that faculty who made strides toward actively engaging students found some success in reducing student attrition (Tirrell & Quick, 2012).

Research conducted by Chang & Chen (2014) used what is referred to as the Kirkpatrick Framework in evaluating the effectiveness of online learning. The Kirkpatrick Framework is based on four core elements designed to enable digital learning to be effective: a relevant curriculum, challenging assessment, emphasis on higher order thinking skills including creativity, and providing students the opportunity of ownership of their learning and assessment. In Chang & Chen's study of 206 university students over two academic years (2010-2012), they found that empirical data provided support for the effectiveness of online learning using the Kirkpatrick model. It is interesting to note that the components of this model are similar to other learning models such as Dewey's (1938) *cycle of learning* which is based on the premise that with appropriate guidance by educators, students will assume responsibility for their own learning by actively creating new knowledge based on connections with past learning. Dewey's *cycle of learning* supports the importance of students going through five stages as they learn: ask questions, investigate via problem solving, create new knowledge by synthesizing information, discussion with others, and reflecting on new knowledge learned. This approach is further supported by others including Bonwell & Eison (1991) who identified student engagement, active learning, and integrative instruction as crucial components of learning.

Discussion

The growth in the number of hybrid and online college courses is indicative of their popularity and ability to offer instruction to consumers who might otherwise lack access to higher education or find it difficult to attend traditional classes. A key point emphasized here is that the social aspects of learning provided by: Discussion Board activities, frequent instructor/student interaction, group and experiential opportunities, has greatly enhanced teaching and learning in a virtual educational environment. Rausch & Crawford (2012) have noted that the social aspects of learning have been ignored or undermined, yet they greatly contribute to a sense of community and engagement—components of effective course structure. They further note that analysis, reflection, and synthesis can be effectively used to create, support, and facilitate rigorous hybrid or online learning.

Whether courses are structured traditionally (face-to-face), hybrid, or online, we can only create an environment that is conducive to learning by working skillfully together; the rest is up to our students.

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Title

Using learner profiling technique to predict college students' tendency to choose elearning

courses: A two-step cluster analysis

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Keywords

college students; distance education enterprise, elearning; affinity for technology; separation of

school life and personal life

Using learner profiling technique to predict college students' tendency to choose elearning

courses: A two-step cluster analysis

Abstract

Profiling elearning students is becoming a common practice in the field. In this phase of the investigation, we plan to (a) follow up on the recommendation for further research we stated in an earlier study on learner preference in types of elearning courses and (b) explore plausible patterns (profiles) based on two learner characteristics/behaviors (i.e., perceived distance between social life and school life and perceived affinity for technology) and their relationship with choices of learning environments where students learn most. Results suggested that (a) the probability of a student in favor of elearning was 1.29 times more likely when the student was LDAA, as opposed to HDLA, and (b) the probability of a student in favor of elearning was 1.26 times more likely when the student was HDHA, as opposed to HDLA. Implications of the results are discussed.

Introduction

Categorizing, or arguably profiling, elearning students is becoming a common practice in the field (Archer, Chetty, & Prinsloo, 2014; Baxter, 2012; Yukselturk & Top, 2013), despite that profiling carries a negative connotation to some (Jones, 2012). Using a Web survey, an increasing number of learner characteristics and demographics can be studied in a form of data. Given this easy access to the collected data, researchers have attempted to take into account multiple profiling variables at once, instead of dealing with one variable at a time. This attempt makes the design of their studies more sophisticated and more versatile. It also assists the researchers in finding hidden patterns of the learners and their behaviors (Shih, Jheng, & Lai, 2010). Most importantly, their research results enable the top management team to make informed decisions. One major advantage of two-step cluster analysis adopted in this study is that it allows researchers to consider both continuous/numerical and categorical/nominal variables at a time as other clustering techniques, such as K-Means Cluster and Hierarchical Cluster in SPSS, are limited respectively, as Şchiopu (2010) pointed out.

Review of Literature

Literature shows that profiling students as a predicting technique can provide insights in who appears more college-ready than others and how successful college students strive to progress, against all odds, in their academic endeavors. In an attempt to ascertain student success, Purnell, McCarthy, and McLeod (2010) reported the promise and efficacy of an early warning system that identifies students at-risk prior to these students' enrollment in any of the college classes at an Australian regional university. They also argued that the timing of the

institutional intervention is critical. As soon as the students at-risk are profiled, the intervention measures must be put in place. The sooner the personalized intervention is taken, the more effective those measures (e.g., receiving direct, immediate assistance with studies, and setting personal, realistic goals) are found.

To enhance open distance learning or ODL students' success, Subotzky and Prinsloo (2011) proposed a hypothetical model intended to predict the student success by taking into account the extent to which *both* the students and the university fit. Subotzky and Prinsloo argued that their broadly defined student success, in the dynamic context of ODL, is attributed to the degree of fittedness between the two agents (i.e., students and the university), of which the processes are constantly interactive and inherently transformative. Given the fluid nature of the context that characterizes those processes, the two "situated agents" (p. 184), as the two researchers of South Africa called it, there appears to be also unforeseeable consequences or uncertain events that are deemed less predictable than others.

Based on the proposed model by Subotzky and Prinsloo (2011), Archer, Chetty, and Prinsloo (2014) conducted a pilot program to profile successful students and students at-risk in terms of habits and behaviors (e.g., an inclination to change and own), using a commercial instrument. In spite of the resistance of the academics and their concerns over the legitimacy and trustworthiness of the questionnaire, which was initially developed for corporate use, the pilot program was found positive by the majority of student participants.

To profile distance learning students for student success, Onyancha (2010) turned to learner demographics for answers and categorized the learners by their "geographical location (country of residence), gender, occupation, age, and home language" (p. 159).

Similarly, in examining learner profiling as a means to predict student behaviors in the online classroom, Yukselturk and Top (2013) studied online learners' entry characteristics in a hope to explain these learners' classroom behaviors between three distinct learner groups, clustered on gender and work status: male worker group, female-dominated group (with over 50% working), and male non-worker group. In conducting a pairwise comparison, the two Turkish researchers found a significant difference between female-dominated group and male non-worker group in the two classroom behaviors. According to the results of their follow-up comparison analysis, the female-dominated group participated significantly more in synchronous text-based chat sessions and more in asynchronous text-based discussion list (by posting more messages) than the male non-worker group. Though, the academic achievement (i.e., end-of-class grade) was not found significantly different between the three clusters in their study.

Also interested in learner demographics, Jelfs and Richardson (2013) investigated the age factor in testing the common assumption that digital natives outperform digital immigrants in the use of digital technologies. Their findings revealed that older age groups tend to be deep (with a defined goal to fully understand the content) and strategic (with a distinctive goal to score as most points as possible) leaners rather than shallow and less strategic ones, when compared with the younger age groups. Though, when controlling for age, gender, and response mode (online vs. postal), the two British researchers claimed that a positive attitude

toward digital technologies can equally predict the deployment of deep and strategic approaches to learning.

Baxter (2012) found in a qualitative study that successful distance education students can form an identity of a student through communications with fellow students and the tutors (moderators) on the online discussion board. She asserted that at certain points of their school life, distance education students would have discontinued with the school were it not for the tutors' interventions that had helped with the transition phases. In a sense, Baxter's assertion is similar to what Purnell, McCarthy, and McLeod (2010) argued, which we previously mentioned. Both studies seemed to have suggested the importance of timing of the intervention. In Baxter's view, the personal and social identity of being a student is one key factor that explains why students remain motivated and resilient and continue to make due effort in order to succeed in the virtual learning environment. Though, Baxter and Haycock (2014) later noted using online discussion boards to enhance student motivation and foster student identity can be paradoxical within the context of community of practice. The social benefits of such use are more evident and more positive when the students are more engaged (a) in the academic or content aspect than the social aspect of the online forum use, (b) in an inviting and encouraging fashion, and (c) in structured, moderated discussion forums (Baxter & Haycock, 2014).

In this phase of the investigation, we planned to (a) follow up on the recommendation for further research we stated in an earlier study on learner preference in types of elearning courses (Pan, Sivo, García, Goldsmith, & Cornell, 2014) and (b) explore plausible patterns (profiles) based on two learner characteristics/behaviors (i.e., perceived distance between

social life and school life and perceived affinity for technology) and their relationship with choices of learning environments where students learn most. In this context, we decided to conduct a two step cluster analysis to profile our students, a profiling technique suggested by Yukselturk and Top (2013). There is few research in the literature that closely resembles what we intended to do. Research questions we studied are as follows:

Q1. To what degree are students clustered on two variables, perceived distance between social life and school life and perceived affinity for technology?

Q2a. Is there any significant difference between student clusters in their propensity to choose elearning classes (as opposed to face-to-face classes) as the learning environment where they learn most?

Q2b. To what degree do student clusters differ in their probability of favoring elearning when compared with each other?

Method

The present study was designed to continue with our series of research on how college students perceive their existing use and future needs of campus technology. Broadly speaking, the ultimate goal of this research project is to explain and predict the trends of college students' use of information communication and technology, and eventually influence the trends to optimize student success.

This survey research was centered around student success with a sole emphasis on the quantitative nature of the inquiry. The data were initially collected online in collaboration with

EDUCAUSE Center for Applied Research (ECAR) in 2013. These secondary or archival data with a sample size of approximately 2,000 undergraduate students from a southern state university were analyzed for the quantitative research. The university is classified as a Hispanic-Serving Institution or HSI by the U.S. Department of Education. Below are selected demographics of the collected data.

Majority (87.7%) of the respondents were Hispanic. Female students took about 63% of the total respondents; 65% were between 18 and 24 years old; 55.7% were freshmen or sophomore; 94.1% lived off campus; 70.4% were full-time students. Table 1shows descriptive statistics of studied variables in the present investigation.

Table 1

Descriptive statistics of three studied variables

Variable	Descriptive Statistics		
	Mean	Std. Deviation	N
Technology Affinity	39.97	9.41	1707
Distance Betw. Lives	3.76	1.29	1830
Environment Learn Most	2.17	.860	1830

Table 2 indicates the Pearson correlations between perceived affinity for technology, perceived distance or separation of social life and school life, and preferred learning environments where students learn most.

Table 2

Correlations between studied variables

		Technology Affinity	Distance Betw. Lives	Environment Learn Most
Technology Affinity	Pearson Correlation	1	.079[**]	.018
	Sig. (2-tailed)		.001	.447
	N	1707	1700	1701
Distance Betw. Lives	Pearson Correlation	.079[**]	1	-.034
	Sig. (2-tailed)	.001		.153
	N	1700	1830	1821
Environment Learn Most	Pearson Correlation	.018	-.034	1
	Sig. (2-tailed)	.447	.153	
	N	1701	1821	1830

**. Correlation is significant at the 0.01 level (2-tailed).

As stated above, the data were gathered through an online survey in 2013, targeting the undergraduate students at the participating university. There were three studied factors. The

affinity for technology variable is a latent factor, explained by 12 manifest variables with each

measured on a five-point Likert scale (e.g., strongly disagree and strongly agree at the ends of

the continuum). A "Don't Know" option was given. The internal consistency, Cronbach's alpha,

was .89. Likewise, the distance between social life and school life factor was manifested by one

variable, measured on a five-point Likert scale (e.g., strongly disagree and strongly agree). A

"Don't Know" option was also made available. Besides the two ordinal scales, the third factor

dealt with in this study was the type of learning environments students tend to learn more.

There were four options for survey participants to choose one form. Three of the options were

also measured on an ordinal scale. The remaining one option was for students with no

preference.

Results

To answer Q1, the collected data were analyzed using two step cluster analysis in SPSS.

Three viable learner groups/profiles were identified, High Distance High Affinity (or HDHA),

High Distance Low Affinity (or HDLA), and Low Distance Average Affinity (or LDAA). This

profiling was based on average Silhouette = .5, which is considered fair, with the ratio of largest

cluster to smallest cluster at 2.26 (<3). Cluster sizes vary. Respectively, they were 47.1%, 20.9

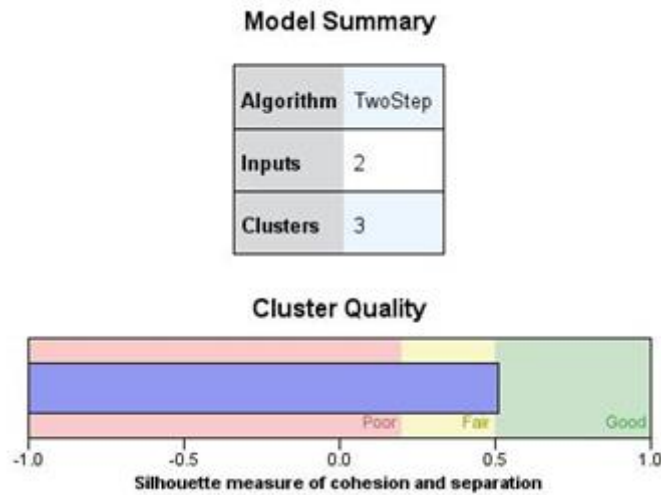and 32%, % (*N*=1694). See Figure 1 and Figure 2 below for more information.

Model Summary

Algorithm	TwoStep
Inputs	2
Clusters	3

Cluster Quality

Poor   Fair   Good

-1.0   -0.5   0.0   0.5   1.0

Silhouette measure of cohesion and separation

Figure 1. The model summary and quality as a result of the two step cluster analysis.

Cluster Sizes

Cluster
- 1
- 2
- 3

32%

47.1%

20.9%

Size of Smallest Cluster	355 (20.9%)
Size of Largest Cluster	801 (47.1%)
Ratio of Sizes: Largest Cluster to Smallest Cluster	2.26
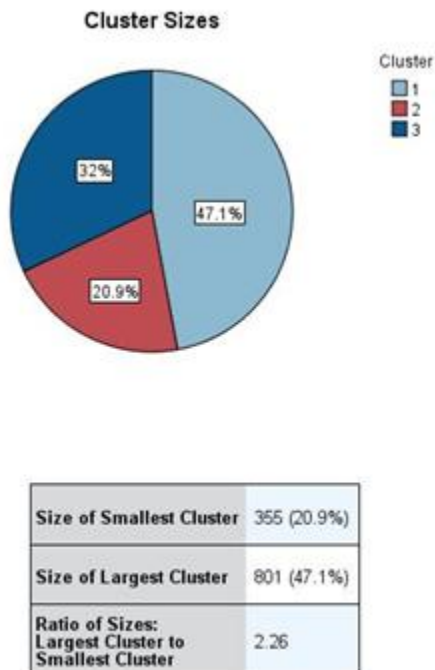
Figure 2. The cluster sizes and their ratio (largest cluster/smallest cluster) as a result of the two step cluster analysis.

In answering Q2a, with student's preference of learning environments regarded as a categorical or nominal variable, we were able to use SPSS to cross tabulate three student clusters and four choices of the preferred learning environment and found there is a scientifically significant difference in the way students in three different profiles perceive different modality as the environment where they learn most, Pearson X^2 (6, N=1694) = 76.04, p < .001, Cramer's V = .15.

For the purpose of the present study, we proceeded with the investigation with a focus on the issue of students' tendency to sign up for an elearning class, as opposed to a non-elearning class (i.e., face-to-face class). To do so, we removed the no preference group and collapsed the remaining three groups into two: elearning group and non-elearning group. In so doing, we merged the group of courses with some online instruction and the group of courses completely online into one big group, named elearning group. The remaining group, courses without any online instruction, stayed the same and was considered non-elearning group. Afterwards, we re-ran the chi-Square procedure using SPSS and cross-tabulated three learner profiles (i.e., HDHA, HDLA, and LDAA) and two preferred learning environments (i.e., elearning and non-elearning). Further results are as follows.

With a two-way contingency table analysis using crosstabs, we evaluated whether students in any of the three clusters/profiles perceive elearning more as a learning environment to learn most. We found there is a scientifically significant difference in the way students in three different profiles perceive elearning as the environment where they learn most, Pearson X^2 (2, N=1481) = 48.27, p < .001, Cramér's V = .18, suggesting students' tendency

to register for elearning classes is correlated with their learner profiles. The proportions of students who perceived elearning is the environment that they learn most across three learner profile groups: HDHA, HDLA, and LDAA were .83, .66, and .85, respectively. Figure 3 below shows the frequency of both elearning and non-learning counts within the three learner groups.
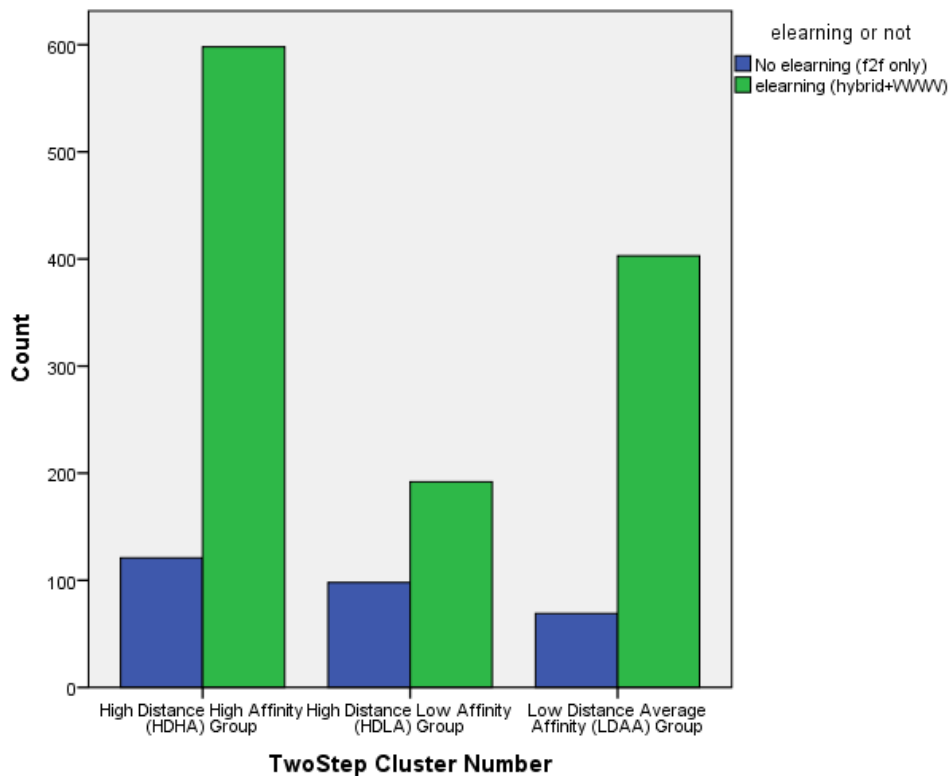

Figure 3. A cluster bar chart of elearning student counts within the student profile categories.

To answer Q2b, three follow-up pairwise comparisons were conducted to evaluate the difference among the proportions aforementioned. Table 3 below shows the results of the analyses.

Table 3

Results for the pairwise comparisons using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	p value (Alpha)	Cramér's V
HDLA vs LDAA	38.59*	<.001(.017)	.23
HDHA vs HDLA	35*	<.001(.025)	.19
HDHA vs LDAA	1.04	.308 (.050)	.03

*p value ≤ alpha

Results indicated that a scientifically significant difference was found between HDLA and LDAA, Pearson X^2 (1, N=762) = 38.59, p < .001, Cramer's V = .23, and also between HDHA and HDLA, Pearson X^2 (1, N=1009) = 35, p < .001, Cramer's V = .19. However, the pairwise comparison between HDHA and LDAA was not found significantly different, Pearson X^2 (1, N=1191) = 1.04, p = .308, Cramer's V = .03. The probability of a student in favor of elearning was 1.29 (.85/.66) times more likely when the student is profiled as a LDAA as opposed to a HDLA; the probability of a student in favor or elearning was 1.26 (.83/.66) times more likely when the student is profiled as a HDHA, as opposed to a HDLA.

Conclusions

In this survey research, we anticipated to focus our investigation on student profiling in hopes to identify plausible student clusters and to explain how the three clusters differ in their propensity to choose elearning courses, as opposed to completely face-to-face courses. The design of the study was quantitative in nature with a Hispanic-Serving Institution as its setting. The data were collected online through EDUCAUSE ECAR in 2013.

Three questions were studied and answered. *Q1. To what degree are students clustered on two variables, perceived distance between social life and school life and perceived affinity for technology?* We found three student clusters on the two dimensions: affinity for technology and distance between social life and school life. Three clusters were named: High Distance High Affinity or HDHA, High Distance Low Affinity or HDLA, and Low Distance Average Affinity or LDAA.

Q2a. Is there any significant difference between student clusters in their propensity to choose elearning classes (as opposed to face-to-face classes) as the learning environment where they learn most? Through a two-way contingency table analysis using crosstabs, we discovered that there is a scientifically significant difference between the three clusters in their tendency to choose elearning as the learning environments they learn the most. The proportion of the students within each cluster in favor of elearning was computed. The follow-up pairwise comparisons were then conducted to answer *Q2b. To what degree do student clusters differ in their probability of favoring elearning when compared with each other?* Three pairs of cluster comparisons were examined. The results suggested that (a) in comparison with students in High Distance Low Affinity or HDLA cluster, the chance of a student choosing elearning was 1.29 times greater when the student was of Low Distance Average Affinity or LDAA, and (b) in comparison with students in High Distance Low Affinity or HDLA cluster, the chance of a student choosing elearning was 1.26 times larger when the student was of High Distance High Affinity or HDHA.

Evidently, students with high affinity for technology had a tendency to choose elearning for their preferred learning environments as the students believe they learn the most in those non-face-to-face classes. So far as the level of perceived distance between social life and school life was concerned, in both comparisons the level of perceived distance seemed irrelevant.

The institution of higher education, if committed to a distance education enterprise and eager to profile students to whom elearning classes are more appealing or less so, may strategize and devote its limited resources to identifying and targeting those students who were low in their affinity for technology. Students low in affinity for technology, according to the 2013 survey results, tended to feel less connected to the school life and professors, and less prepared in transferring majors and applying to graduate school, among others, via technology. Cautions must be taken before the findings are generalized to a different setting. Further research recommended may deal with profiling students who are attracted to face-to-face courses, include a longitudinal study on the predictability of student affinity for technology in student success, and model causal relationships between affinity for technology and its viable antecedents in the context of elearning.

Acknowledgements

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About HETS

The **Hispanic Educational Technology Services** (**HETS**) started in 1993 as a group of institutions interested in sharing courses at a distance. Since its inception, the HETS Consortium has evolved from the use of telecommunications to the asynchronous modes of anywhere-anytime learning, using technology to reach greater collaboration among and within educational institutions. Headquartered in San Juan, PR, HETS networks Hispanic and Emerging Serving Institutions in the United States, Puerto Rico and Latin America in an effort to widen educational opportunities and access to post-secondary education through the use of the technological modalities of distance education. To HETS, and its 43 institutional members, technology can especially transform service delivery styles and open the doors to a larger spectrum of audiences. These technologies continuously facilitate the teaching-learning process and foster the expansion of a web of services that promote learner success. For more information about us and our services send an email to: info@hets.org or go to our website www.hets.org.