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DIFFERENT. ON PURPOSE.

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DIFFERENT. **ON PURPOSE.**

A MESSAGE FROM THE PROVOST, SENIOR NATIONAL DEAN OF FACULTY AND MANAGING EDITORS

We are excited to introduce the third volume of the *DeVry University Journal of Scholarly Research*. This issue includes four highly topical papers along with book reviews that expand the scope of the Journal into a diverse range of new areas.

The papers highlight important concerns in academia related to academic metrics, simplifying teaching strategies to increase effectiveness, and two different applications of the notion of community of practice. Within the book review section, a conversation between DeVry professors John Morello and Loretta Nyhan is featured. Professor Nyhan, who is also a published literary fiction author, provides insight into the writing process and what it's like to collaborate with a co-author.

As always, we are continuing the evolution of the Journal. In future issues, we plan to publish case studies that describe real-world business scenarios. Senior National Dean Oscar Gutierrez describes this effort further in the Letters to the Editor section. We are also welcoming faculty submissions related to conference activities and papers sharing rich pedagogical experiences that increase student engagement in the classroom.

Finding the time to develop scholarly work can be challenging. We congratulate and thank our contributors for engaging in this activity that benefits us all. To view or share current and past issues of the Journal, visit the DeVry University Newsroom: *newsroom@devry.edu*.

Sincerely,

Donna A. Rekau, PhD
Interim Vice President of
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Senior National Dean of Faculty

Sarah Nielsen, EdD
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JOURNAL INFORMATION

The *DeVry University Journal of Scholarly Research* (ISSN 2375-5393 1) is a semi-annual multi-discipline peer-edited journal devoted to issues of scholarship and education research. The journal is the work of the faculty, staff and administration of DeVry University. The views expressed in the journal are those of the authors and should not be attributed to the sponsoring organizations, or the institutions with which the authors are affiliated.

MANUSCRIPT SUBMISSIONS INFORMATION

The journal welcomes unsolicited articles on scholarship, education research or related subjects. Text and citations should conform to APA style: *Publication Manual of the American Psychological Association* (6th ed.). Because the journal employs a system of anonymous peer review of manuscripts as part of its process of selecting articles for publication, manuscripts should not bear the author's name or identifying information.

Electronic submissions of manuscripts (MS Word) and all other communications should be directed to:

DUJOSR@devry.edu

EDITORS AND REVIEWERS

DeVry faculty who wish to apply for positions on the Journal's board of editors or as reviewers of manuscripts should contact Sarah Nielsen or Deborah Helman.

PEER REVIEWERS FOR THIS ISSUE:

The following DeVry faculty served as peer reviewers for this issue. We thank them for their service.

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In support of helping colleagues and students gain an in-depth understanding of ethical research processes, the IRB obtained a Collaborative Institutional Training Initiative (CITI) membership. CITI provides globally accepted training that aids the research process. Those who wish to submit applications to the IRB are required to complete CITI training beforehand.

For additional information, you can contact the DeVry University IRB through the following email address: *dvuirb@devry.edu*.

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LETTERS TO THE EDITOR, AUDRA SPICER, PHD

The College of Business & Management welcomes the third volume of the *DeVry Journal of Scholarly Research (DUJOSR)* and would like to acknowledge the efforts of the *DUJOSR* and its supporters in helping to build the scholarly reputation of DeVry University. Success has manifested in several ways: a collaboration with DeVry Brasil, efforts to encourage collaborative research and publication amongst the faculty, and a renewed interest and enthusiasm for participation in conferences.

This environment and growing infrastructure are providing us with the opportunity to encourage faculty to develop teaching case studies designed to provide the Keller Graduate School of Management with a repository of unique teaching materials. Our vision is to leverage off of the processes developed by the *DUJOSR* to publish case studies that resonate with our graduate students. Faculty are encouraged to develop case studies based on real business situations to enhance the learning experience for students. The COBM looks forward to developing this collaboration with the *DUJOSR*.

Colleagues, this is one way of contributing to the enhancement of our graduate students' learning experiences and to accomplish scholarly activities requirements.

Oscar Gutierrez, PhD
Senior National Dean, DeVry University College of Business & Management
Dean, Keller Graduate School of Management

Our first DeVry-Pernambuco International Engineering Seminar happened in 2014, and it was a big success. Our greatest challenge last year was to "make it bigger." We started by choosing a better location for the event, somewhere that would make our seminar even more special. That's what led us to choose the *Arena Pernambuco*, yes, our Fédération Internationale de Football Association (FIFA) World Cup-built soccer stadium. That's when the "wow" effect took over. When we passed by our classrooms advertising the event, all we could hear were "wows" from the students (it was actually *uau* in Portuguese). his particular sound indicated that we were definitely going in the right direction, and there was still a lot of work to accomplish.

When I picked up our guests at the airport, I immediately knew our success was guaranteed, but when we got to the stadium, it was our turn to say "wow." We felt a good, special, and positive vibe.

In this one huge event, we could see all of our DeVry values exemplified (even the new ones, when we think about it). The good energy was felt everywhere, with the positive spirit shown by all of those interested students and the results of our international team coming through. We felt like engineers in continued improvement (in 2016, we will go even further). In Recife, Caruaru, João Pessoa, Salvador, and Fortaleza, integrated teamwork made its mark with ownership and initiative, demonstrated by courage and integrity, with care, respect, and passion.

The Seminar occurred over three days: one in Salvador, one in Recife (with students from three cities – João Pessoa, Recife, and Caruaru), and the last day in Fortaleza. We had 10 speakers and exactly 3,369 participants (engineers are precise). We also raised over seven tons of food in donations and our social awareness in this process. Combined with academic production, integration and knowledge, it was simply *wow-some*. We encourage professors from our overseas colleges to come and participate, for we are willing and able to make things even better.

Ms. Iara Margolis
Academic Program Dean, Faculdade Boa Viagem, DeVry Brasil

Prof. Dr. Alvaro de Oliveira Azevedo Neto
Law Academics Dean, Faculdade Boa Viagem, DeVry Brasill

I'm writing in response to Andrea Henne and Shawn A. Schumacher's essay *New Learning Models and Methodologies Shaping the Future of Higher Education*, which introduced emerging education modalities, among them Competency Based Education (CBE). As I had simultaneously begun researching CBE specifically, I thought I would take the opportunity to thank Andrea and Shawn and add my research to the mix.

CBE is not new, as its advocates will quickly point out. Education via correspondence had a respectable presence in the 19th century, catering to populations seeking vocational training. Indeed, learning at its root is competency based. The contemporary interest in CBE responds to key problems in modern education tied to the emergence of the nontraditional learner — the working-adult student (often with a family and often a first-generation college student), for whom affordability and time are paramount. There is nothing unsound in the foundational premise that an individual's knowledge can be gained by experience, personal study, traditional education, or combinations thereof. The "mastery of competencies" (Ordonez, 2014, p. 47) demonstrated by task completion — "student narratives, demonstrations, simulations, performance-based assignments," portfolios, examination (Klein-Collins, 2013, p. 12) — is, however, contestable, except in the context of fixed processes and rote information. Also, without oversight, the proof of competency is a matter of institutional discretion, and that may be problematic.

CBE rewards the learner for life skills; focuses on mastery of skills, rather than time spent in a classroom; and is learner-focused and self-paced (either accelerated or remediated by the learner him/herself). Demographically, CBE attracts non-traditional learners, students with military service, and those from lower- and middle-class economies (Ordonez, 2014, pp. 49-50). Proponents observe that competency-based degrees are a *fraction of the cost* of four-year traditional college programs. *Sprinters* may finish their degree programs "in months rather than years" (Ordonez, 2014, pp. 50-51). However, as Kamenetz (2013) points out, *struggling* students or those with less time or poor time-management will find costs increase with time (as cited in Ordonez, 2014, p. 51). If, for example, a CBE student purchases a six-month education *subscription* and fails to make progress, s/he may find costs accruing rapidly. Since the CBE demographic is likely subsidized, the costs accrue to taxpayers, a visceral criticism already levied against for-profit education.

CBE is modular in nature. Modules focus on fixed procedures and reported information, and assessments are contained within its modules. These modules are insular with no apparent bridging between modules. Because study is self-paced and learner-centered, there is no professor and no interpersonal engagement. Instead, there are coaches and mentors, who may be contacted at the students' initiation (Ordonez, 2014, p. 51). Critics complain that CBE does not differ from vocational training and wonder whether it should be called *college* or *university* education at all. They point out that CBE further educationally and socially stratifies students of privilege from students of need, providing the latter with degrees of less value (Ordonez, 2014, p. 51) for jobs with *less* earning potential.

One need never fear the self-learner — a Leonardo, for example — whose character, experience, intellectual capacity, and creativity cause him/her to rise like cream wherever s/he lands. And, it should also be noted that Leonardo emerged in a culture of the genius. However, in today's online programs, we have few Leonardo's, and ours is a culture long after virtue.

Judy McCarthy, PhD
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LETTERS TO THE EDITOR (CONT'D)

I grew up in a small village by the outskirts of Nairobi, Kenya. Some of my earliest recollections of the natural world are as a young girl, running bare-footed behind my paternal grandmother to collect firewood, pick fruits from the many trees, or simply play as she tended her gardens. I did not know anything about species, endangered or threatened, nor their hard-to-pronounce scientific names. However, one thing I knew for sure was that plants and animals were very important.

My family was what we call small-scale subsistence farmers. We raised poultry, cattle, pigs, rabbits, and goats for food, and manure from their waste fertilized the garden soil. The gardens were full of tropical fruits: avocados, mangos, guavas, different types of bananas, all sorts of wild berries, and, my favorite, the sugar cane. The seasons dictated when corn (maize), beans, potatoes, peas, onions, kales, spinach, and tomatoes were planted or harvested.

Looking back, this was a very nurturing and simple life, full of valuable lessons. Today, as an adult, I find myself drawing back on this early exposure and experiences, and I can honestly say they laid the foundation for my interest in environmental studies.

One of the lessons from my childhood, which became more defined later on in the academic arena, is that our lives totally and wholly depend on plant and animal species. We need species for food, shelter, medicine, oxygen, soil enrichment and conservation, tourism, and more so for their natural beauty!

Over the years as an environmental science professor, I have had the opportunity to share my passion, experiences, and knowledge with hundreds of students in Kenya, Germany, Botswana, and the USA. It never ceases to amaze me how many of my students have never really thought about the links between their lives and those of other species with which we share a planet.

One of my biggest concerns today with our busy lives is that above all the noise that surrounds us, we hardly hear anything about species conservation. We need to stop, look around, listen, and learn something from nature. We need to stop taking plant and animal species for granted and give them the recognition they deserve. We need to educate our communities, old and young, about the important roles played by species. More so, we need to get involved in conservation efforts. If we take proper care of the plant and animal species that we have today, then future generations can enjoy the same resources. I strongly believe that it is important to undertake sustainable conservation efforts

Finally, the message to my DeVry family and our community as a whole is that we must take a hard look at our lives and ask the question, "Do plant and animal species really matter to me?"

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Investigating Engagement and Net Promoter Scores as Each Relates to Student Persistence

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Abstract

It is the goal of every academic institution to support the development of its students throughout the educational journey. Many efforts support students as they persist in their educational endeavors so that they reach graduation. This study examined faculty engagement scores and campus net promoter scores at a US-based, multi-located, proprietary University from 2011 to 2012 to determine whether there had been a significant effect on persistence. There is little research bridging faculty engagement to student persistence measurements or student loyalty scores, like net promoter scores, for any given university. The study findings were statistically non-significant. Because of this, one cannot conclude that faculty engagement scores, or net promoter scores, have or do not have a correlation to student persistence measures. Thus, this study should not be generalized to any other academic institution. Further research on this topic is encouraged.

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Keywords: engagement, faculty engagement, persistence, net promoter score

Engagement is a multi-faceted word with numerous definitions, and with applications in a variety of settings and contexts. Employee engagement has become an increasingly important topic in the corporate world (Bedarkar & Pandita, 2014; Kabachnick, 2006). Applying business concepts like engagement to higher education might assist colleges and universities in dealing with the current and unrelenting challenges related to competition, growing costs, diminishing state budgets and problematic employment projections. Universities, like businesses, need tools for efficient decision-making and sound fiscal management (Keep, 2012). However, concepts used in the business world often migrate slowly to higher education. Nevertheless, academia is considering faculty engagement and student engagement (Umbach & Wawrzynski, 2005).

Engaged employees are motivated toward high performance, connected to the workplace culture and involved with the inner workings of the organization. In other words, they mesh or fit the organization for which they work (as cited in Bedarkar & Pandita, 2014). There are many facets of engagement, particularly as it relates to persistence. The full literature review explored the following themes: education and the business model debate, engagement in the workplace and its measurement, the application of the concept of engagement to faculty and to students, the link between faculty engagement and student retention and, finally, the concept of net promoter scores and their implications. To clarify the terms used in this study, the following definitions were created.

Definition of Terms

Engagement is defined as the connectedness an employee has toward the workplace. Definitions vary, but engaged employees are often described as "involved, occupied, committed, meshed and participating. The most significant attribute of the engaged employee is that she is 'unavailable' to anyone else, meaning other employers" (Kabachnick, 2006, p. 27).

The term *engagement* as applied to the workplace first appeared in research by Kahn (1990). His research focused on how people "occupy" their roles at work. Physical, cognitive and emotional elements work together to explain how fully, and to what degree, people feel engaged or disengaged in their work. His research delineated three psychological conditions that correlate with engagement: meaningfulness, safety and availability.

> Meaningfulness: feeling worthwhile, useful and valuable, work is not taken for granted, people feel they can give back to others and also receive. Safety: able to show and employ oneself without fear of negative consequences to self-image, status or career. Availability: having the physical, emotional and psychological resources to personally engage at a particular moment. It measures how ready people are to engage. (Kahn, 1990, p. 704-714)

Motivation appears to be a key component when considering engagement. Extrinsic rewards are items like employee compensation, extra money awards, and increased commissions. These are tangible perks, outside the realm of the work being done, awarded by management to ensure that tasks are done correctly. "Intrinsic rewards come to workers directly from the work they do – satisfactions like pride of workmanship or the sense that they are really helping a customer" (Thomas, 2009, pp. 12-13).

Faculty Engagement Scores measure the extent to which faculty are engaged with their colleagues, their students and their campus environment. Faculty engagement scores in this study were defined as the score which a faculty member receives after completing the employee engagement survey. It is important to clarify that the faculty engagement score used in this study speaks to the connectedness a faculty member has toward the workplace. Faculty engagement scores were combined and then averaged, per location, so as not to identify any single faculty member. Additionally, the engagement scores were isolated strictly to full-time faculty members. At many higher education institutions, faculty engagement is not measured by an employee survey, but instead is based on faculty interacting and working outside of traditional university duties; such as teaching and research, to connect with organizations and community sponsors.

The net promoter scores used in this study are numeric measures of student loyalty to a chosen institution. The course evaluation asks each student the following question: "Would you recommend this university to a friend?" Students who respond to the question with a 9 or 10 are promoters. If they answer with a 7 or 8, they are considered passive. Students responding to the question with a 0 through 6, are considered detractors. The net promoter score (NPS) calculation subtracts the number of detractors from the number of promoters and divides by the total number of those surveyed. The raw NPS score is multiplied by 100, to adhere to a 0 to 100 scale. Passive responses are ignored in the calculation (Reichheld, 2006).

Persistence is measured as the rate of student enrollment from one semester to the next. Semesters must be consecutive; students cannot take a term off and be counted in the persistence measurement.

Retention is a measure referring to "students' continued study until successful completion" (Fowler & Luna, 2009, p. 70). For clarification, retention is defined for the purpose of this study. However, retention was not used as a comparative measure.

Background on Persistence

The National Defense Education Act of 1958 established a policy to increase access to higher education (U.S. Department of Education, 2012). Since that time, the Department of Education has assisted college and university students with financial support. "On a range of outcomes – from personal development, health, and the like – evidence abounds that college graduates fare far better than nongraduates" (Tinto, 2012, p. 1). It is the goal of every academic institution to support the development of its student population throughout the educational journey. Many efforts support students as they persist in their educational endeavors so that they reach graduation. Even slight improvements in persistence are celebrated. Increased persistence often leads to higher retention and, ultimately, more students graduating.

Purpose and Research Questions

The purpose of this study was to explore the relationship between two independent variables: faculty engagement scores and net promoter scores (a measure of loyalty) as each relate to student persistence. All measures used in this study pertain to undergraduate students. A combined persistence measure (for each campus location) was used as a

measure of success. The research question is as follows: Do 2012 faculty engagement scores and 2012 net promoter scores have a predictive relationship to the 2012 student persistence as measured collectively at University locations?

Hypotheses

The following hypotheses, based on the research questions, explore the relationship between campus faculty engagement scores, campus net promoter scores and persistence at the given University.

H_{01} There is no relationship between 2012 faculty engagement scores and 2012 persistence measures when controlling for or removing the effect of 2012 net promoter scores.

H_{a1} There is a relationship between 2012 faculty engagement scores and 2012 persistence measures when controlling for or removing the effect of 2012 net promoter scores.

H_{02} There is no relationship between 2012 net promoter scores and 2012 persistence measures when controlling for or removing the effect of 2012 faculty engagement scores.

H_{a2} There is a relationship between 2012 net promoter scores and 2012 persistence measures when controlling for or removing the effect of 2012 faculty engagement scores.

Brief Description of the Research Design

This quantitative study included a correlational design methodology using archived data. This data ensured no location or individual was identifiable. Therefore, this research endeavor did not require IRB oversight. The data examined was taken from three existing recorded sources at a proprietary University from 2011 to 2012. Correlational designs examine relationships in an attempt to predict outcomes. If a relationship does exist between two or more independent variables, the strength of the relationship to a single dependent variable can be studied. Furthermore, if a strong relationship exists, this analysis shows which one of the independent variables is the best predictor of the dependent variable (Gall, Gall, & Borg, 2007). The design in this study employed the specific correlational procedure multiple regression, investigating the relationships among multiple variables. The correlational design includes the following pieces of data: faculty engagement scores, net promoter scores, and persistence measures. Two multiple regression models were employed in the study: a 2011 model and a 2012 model. This article will focus on the 2012 model. *Figure 1* was created to clarify the data collection time frame.

Independent Variables

Independent variables are characterized as "a variable hypothesized to cause one or more outcomes" (Slavin, 2007, p. 8). Two independent variables were used in this study: faculty engagement score and net promoter score. The faculty engagement score is a mean average score extracted from the campus-wide employee engagement survey results. The net promoter scores were derived from the end-of-term student-based course evaluations. The net promoter scores used in this study are numeric measures of student loyalty to a chosen institution.

IV1: 2012 Faculty engagement score

IV2: 2012 Net promoter score

Dependent Variables

By definition, a dependent variable is an "outcome variable hypothesized to be affected by one or more causes" (Slavin, 2007, p. 8). The dependent variable used in this study was a measure of persistence. The 2012 persistence measure shows what percent of students were continuously enrolled from spring 2012 into summer 2012. The persistence measures were assessed by site ID (location). The 2012 persistence measures were extracted from the University system portal. Surveys used were completed in the April/May timeframe.

DV1: 2012 Persistence measure

Figure 1. *The Data Collection Time Frame*

	January–February	March–April	May–June	July–August	September–October	November–December
2012		FES Data Collected			**The Persistence Measure was calculated for those students enrolled in the March though June semester who re-enrolled in the July semester.**	
		NPS Data Collected				
				Persistence Measure Calculated		

Figure 1. *This figure illustrates the time frames for all data collected.*

Data Analysis

All analyses for this study were conducted using SPSS version 21.0, in an Apple environment using Mac OS X version 10.6.8. The data were imported into an Excel spreadsheet and examined for potential errors.

Multiple Regression

This study employed multiple regression, which is an extension of correlational analysis. It examined the relationship of two or more independent variables to one continuous dependent variable. It is useful when examining "the predictive ability of a set of independent variables on one continuous measure" (Pallant, 2010, p. 104). In addition to showing the predictive relationship among the variables, it also assesses "the relative contribution of each individual variable" (Pallant, 2010, p. 122). Data assumptions in this study related to sample size, multicollinearity and singularity, outliers and distribution of scores.

Sample size is an important consideration, as it is one factor determining the power of a study ("What is Power Analysis?" n.d.). A power in excess of 80 percent is needed to detect relationships between variables, if such a relationship truly exists. This study used the following calculation: $N > 50 + 8m$. N is the sample size needed and m is the number of independent variables used in the study (Tabachnick & Fidell, 2004). Using this calculation, the sample size for this study needed to be greater than 66. ($66 = 50 + (8 * 2)$)

Because of the confidentiality agreement with the third party firm Spring International, raw faculty engagement scores were not accessible. Individual faculty engagement scores cannot be disclosed. The confidentiality agreement with Spring International stated faculty engagement scores cannot be grouped or averaged with less than 10 members to any given group, to assure individual scores remain private. The estimated number of faculty participating in the faculty engagement surveys was 400 – 600. However, the faculty engagement scores, the net promoter scores and the persistence measures are reported as mean averages by campus location. The total faculty participating in the faculty engagement survey cannot provide the basis for the sample size. Each campus location is considered a single data point with composite data. Had all faculty throughout the 95 campus locations provided feedback via the survey, the required sample size of 66 would have been met. However, since only 19 of those campus locations provided survey data, this small sample size was a limitation of this study.

Correlation Analysis Considerations

Several areas of caution exist when considering correlation analysis. First, the significance level was assessed and interpreted. A significance level is in part a measure for how much confidence the researcher should factor into the determined results (Pallant, 2010). Caution is urged when drawing conclusions about large populations of data, using smaller sample sizes. Although some error exists when using sample data, it is important to gain an understanding of the relationship between the variables in the population. Second, the sample size N was less than the required 66 to detect medium effects. The sample size is not sufficient to provide a power in excess of 80 percent. Third, the correlation coefficient (r) is not a distinct measure stating one variable causes another (Pallant, 2010). It is simply a suggestion concerning the relationship between the two variables. Fourth, statistical significance needs to be measured in association with practical significance, including other research done on the topic (Pallant, 2010). Last, after the multiple regression analysis was completed on all research questions, the (r) value was squared to compute the coefficient of determination. The part r^2 values for each of independent variables explain what percent of the variance in the dependent variables is uniquely clarified by each of the independent variables.

2012 Model Statistics

Descriptive statistics are listed in *Table 1* for model year 2012. Calculations for the minimum, the maximum, the mean and the standard deviations are displayed for all variables: faculty engagement scores, student net promoter scores, and persistence measures (percentages).

Table 1: Descriptive Statistics for Model Year 2012

	N	Minimum	Maximum	Mean	Std. Deviation
Faculty Engagement Scores 2012	19	39.00	86.00	66.3158	13.42077
Net Promoter Scores 2012	19	23.47	64.64	37.5068	9.93916
Persistence 2012 (percentages)	19	74.65	83.93	79.3611	2.25939

The 2012 faculty engagement scores ranged from a low of 39.00 to a high of 86.00. The mean faculty engagement score for the 2012 model for all 19 campus locations was 66.3158 (SD = 13.42077). The net promoter scores ranged from a low of 23.47 to a high of 64.64. The mean net promoter score for the 2012 model for all 19 campus locations was 37.5068 (SD = 9.93916). The persistence percentages ranged from a low of 74.65 percent to a high of 83.93 percent. The mean persistence measure for the 2012 model for all 19 campus locations was 79.36 percent (SD = 2.25939).

2012 Model Results

The number of University locations able to submit faculty engagement data was severely limited with only 19 of the 95 locations reporting. Because of this limitation, the results of the 2012 Model were statistically non-significant. Therefore, any attempt to assess the effect of 2012 faculty engagement scores and 2012 net promoter scores as they relate to 2012 persistence measures would be statistically inappropriate, as the results could be due to error or chance.

Preliminary analyses were completed with caution to make certain the assumptions of normality, linearity, multicollinearity and homoscedasticity were without violation. The results for the 2012 model summary are non-significant, as a small sample size can only detect very large effects, and any potential relationship was too small to be detected by the limited sample size. The detailed results for the 2012 model summary are as follows. The total variance, as reported by R^2 in the 2012 model summary was 4.7 percent, $F(2, 16) = .394$, $p = .681$. The faculty engagement score stated .8 percent of the variance with $\beta = -.089$, $p = .720$, $t = -.365$. The net promoter score stated 4.2 percent of the variance with $\beta = .206$, $p = .413$, $t = .840$.

The R^2 value shown in *Table 2* indicates the 2012 model shows that only 4.7 percent of the variance in the dependent variable persistence is explained by the model for both independent predictors' faculty engagement measure and net promoter score. Because the sample size is very small, Tabachnick and Fidell (2007) warn this can be an indication the R^2 value is an overestimated representation of the true value of the population. The results for the 2012 model summary are non-significant, as a small sample size can only detect very large effects, and any potential relationship was too small to be detected by the limited sample size: .012.

The statistical significance of the 2012 model was determined by the significance value reported in *Table 3*. The reported significance level was .681, above the threshold of $p < .05$ for statistical significance. The significance of each independent variable was considered by noting the significance column of the correlations between variables for Research Question 1 Table, *Table 4*. Independent values with significance values below .05 are considered to have "a statistically significant unique contribution to the equation" (Pallant, 2010, p. 161). 2012 Faculty Engagement Scores had a sig. score of .388. 2012 Net Promoter Scores had a sig. score of .209. Thus, none of the 2012 independent variables for the 2012 Model should be considered a statistically unique contribution as a predictor.

The correlations between variables for the 2012 model are noted in *Table 4*. Reviewing the Pearson correlation between the independent variables, the correlation between Faculty Engagement score and Net Promoter Score is .096. This indicates a slightly positive correlation between the Faculty Engagement Score and the Net Promoter Score. However, since the p value of the correlation is .348, and is larger than .05,

Table 2: Summary for Model Year 2012

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.217[a]	.047	-.072	2.33952

Table 3: ANOVA[a] for Model Year 2012

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.313	2	2.157	.394	.681[b]
Residual	87.573	16	5.473		
Total	91.887	18			

a. Dependant Variable: Persistence 2012

b. Predictors: (Constant), NPS 2012, FES 2012

it is not of statistical significance. Further review of the correlations table showed the largest correlation to be between the independent variable Net Promoter Score and the dependent variable Persistence, with a value of .198. However, the .209 p value associated with this largest correlation is also above .05, and thus could be due to chance or error.

Table 5 investigates the contribution of each independent variable as a predictor to the dependent variable persistence. The part r in the correlations section of the Coefficients Table 5 was squared to show the unique contribution toward the dependent variable persistence. The 2012 faculty engagement score part r (-.089) was squared (.007921) and reported .8 percent of the effect on 2012 persistence, after controlling for the effect of second independent variable 2012 net promoter score. The 2012 net promoter score part r (.205) was squared (.042025) and reported 4.2 percent of the effect on 2012 persistence, after controlling for the effect of the independent variable, 2012 faculty engagement score. For both of these independent variables, the value in the column marked sig. was checked to determine if each of the variables made a "statistically significant unique contribution" (Pallant, 2010, p. 161). The sig. value for 2012 Faculty Engagement Score was .720. The sig. value for 2012 Net Promoter Score was .413. Both the Faculty Engagement Score sig. value of .720 and the Net Promoter Score sig. value of .413 were larger than .05. Neither independent variable made a significant unique contribution toward persistence.

Limitations & Delimitations

This study was limited to a national proprietary institution. Persistence measurements were intentionally restricted to include the persistence measure most closely associated with both the faculty engagement measure and the net promoter score measure collection. Because faculty engagement survey results are classified, the faculty engagement scores utilized cannot be openly associated with any given university location. A transposition process was used to associate the faculty engagement data with a sequential site ID. This transposition process kept the faculty engagement data confidential.

Significance of the Study

The findings in this study are important to improving persistence measures for all higher education students. Higher education institutions of all varieties want their students to persist toward graduation. Correlations drawn from faculty engagement scores serve to establish firm connections between a university, its faculty, and its students. Correlations drawn from net promoter scores provide a basis for understanding students' loyalty to a given institution. These correlations not only point to how students understand the value of their education, but also how educational institutions value their students as customers. Academic institutions are wise to investigate student retention and graduation rates. As Tinto (2004) encouraged, it helps to make sure "students not only get in the door of higher education but also are successful in staying there through the completion of a degree" (p. 3).

Table 4: Correlations between Variables for Research Question 1

		Persistence 2012	FES 2012	NPS 2012
Pearson Correlation	Persistence 2012	1.000	-.070	.198
	FES 2012	-.070	1.000	.096
	NPS 2012	.198	.096	1.000
Sig. (1-tailed)	Persistence 2012	.	.388	.209
	FES 2012	.388	.	.348
	NPS 2012	.209	.348	.
N	Persistence 2012	19	19	19
	FES 2012	19	19	19
	NPS 2012	19	19	19

Table 5: Coefficients for the Model Year 2012

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
(Constant)	78.603	3.325		23.640	0.000	71.555	85.652	-		-		
FES 2012	-0.015	0.041	-0.089	-0.365	0.720	-0.103	0.072	0.070	-0.091	0.089	0.991	1.009
NPS 2012	0.047	0.056	0.206	0.840	0.413	-0.071	0.165	0.198	0.206	0.205	0.991	1.009

a. Dependant Variable: Persistence 2012

Discussion

Although this article focused on the 2012 model, neither the 2011 nor the 2012 model was statistically significant. After considering the overall research results, some common threads emerged from both research models. First, one cannot conclude that faculty engagement scores have, or do not have, a correlation to student persistence measures. Second, one cannot conclude that net promoter scores have, or do not have, a correlation to student persistence measures. Because both years' models are statistically non-significant, the researcher cannot state that either model had an effect on student persistence.

A key component of many engagement discussions is intrinsic motivation. Researching intrinsic and extrinsic factors relating to faculty engagement, Holland (1999) concluded faculty were most interested in "intrinsic rewards," stating faculty "engage in service because it's the right thing to do and because it allows them to link their personal and professional lives" (p. 38). The researcher would like to suggest that although faculty might have scored the faculty engagement survey poorly with low scores, they still completed their academic tasks with excellence. It is possible a faculty member could feel disconnected from their employed institution, yet serve their students with quality and sincere effort. Given a statistically significant study, this might explain why the faculty engagement scores do not correlate to persistence measures overall.

Although engagement is a new area of research from both the faculty and the student perspective, its influence is becoming more visible. Writing about faculty and student engagement, Kim (2013) discusses the varied options students have within the higher education arena: Massive Open Online Courses, (MOOCs), podcasts, and other online options. However, Kim also states one of the key factors to consider when deciding about academic programs has much to do with engagement, not just learning new content. He encourages prospective students to ask questions about the type of time and involvement they will have with both faculty and students. Collaboration, communication, and a sense of collegiality are priorities in the decision-making process. He stresses the importance of faculty and student interest stating, "You want to find a program where the faculty is on a first-name basis with the students" (Kim, 2013, p. 27). Clearly, this researcher points toward the importance of an active engagement connection between faculty and student. This satisfies the intrinsic motivation from a faculty point of view, and gives each student value in the learning process. No substitute exists for this type of instructor to student relationship, as it gives purpose to the work being done.

Recommendations

To date, no study has applied the two business measures, faculty engagement scores and net promoter scores, to student persistence in a higher education institution. Thus, the possibilities for future research in this area relating to academic success, retention and persistence are wide open. New programs, initiatives and campus-wide efforts consistently work toward the improvement of student persistence. Based on these results, the researcher suggests further investigation.

One prominent suggestion would be to continue to collect data from multiple Universities, encouraging voluntary faculty engagement survey participation. Participation might increase if individual identities were to remain anonymous. Reporting could be both individual and categorically grouped. Furthermore, the researcher would like to suggest the employee engagement survey questions be expanded to address the many threads of engagement relating to the faculty: employee engagement (the current workplace engagement definition connecting faculty to the institution) and scholarly engagement (addressing how faculty perceive day-to-day purposeful work, encompassing teaching, research, students and community).

Net Promoter Scores and Faculty Engagement Scores need further investigation and a deeper understanding among all represented on campus. Data can easily be mismanaged and wielded haphazardly as answers to difficult questions are sought. This study raises important questions about what measures best encourage student persistence.

Conclusion

Although the limited number of sites reporting data rendered this study non-significant, research points toward insufficient evidence that the metrics currently used at the University cannot be used to judge the effectiveness of faculty engagement scores and net promoter scores, as each relate to persistence. This study highlights that the evidence does not support evaluating sites based on the current form of data. Expanding the engagement survey to include the multiple facets of engagement would help to provide a clearer picture of faculty and the impact of their wide-ranging efforts toward student persistence.

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Using Algebraic and Transcendental Equations to Teach Basic Cryptographic Programming

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Abstract

The teaching of cryptographic programming typically requires both instructors and students to allocate a significant amount of time to the discussion and comprehension of abstract and theoretical mathematical contexts. In this paper, the author describes how to guide students through hands-on coding projects with simple, high-school-level algebraic and transcendental equations to experience and visualize mathematical equations that can be applied to the design, development, and implementation of modern cryptography. The author explains how to (a) address the weaknesses, issues, and barriers of these equations as candidates of encryption mechanism; (b) lead students to develop problem-solving skills to strengthen and optimize the proposed encryption and decryption algorithms; and (c) prepare the instructional materials and sample codes. This paper also empirically verifies the practical aspects of cryptographic programming without using advanced and complicated mathematics.

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With the rising tide of cybersecurity curricula at college level, cryptographic programming becomes a new topical area of network security, application security, cryptography, and advanced programming courses. However, the currently available instructional materials, including textbooks and reference books, are mainly written for students majoring in either computer science or mathematics with a strong background in calculus, discrete mathematics, algorithm, and probability. The less mathematically prepared students, particularly those who are enrolled in an accelerated program of a practitioner-oriented college, are often very frustrated and struggle when learning mathematics terms, notations, theories, and algorithms before they can start writing cryptographic programs. Such frustration often causes students to withdraw from the course, before instructors have a chance to lead them to develop simple applications and skills of encryption and decryption. Our university, for example, offers a course entitled "CEIS210 Introduction to Cryptography" for the regionally accredited Bachelor of Science in Information Technology (BSIT) degree program. Students, regardless of their level of mathematics preparation, might be required to take CEIS210 for a variety of reasons, including meeting the graduation requirements. The degree program is designed for those who want to pursue a career in the information technology field. The curriculum consists of technology-oriented major courses that emphasize applying computing technology to solve business problems. The coursework of this BSIT program is less theoretical and more practical compared to traditional Computer Science (CS) courses. The curricular objective is to prepare students for a career in designing, developing, or implementing information technologies (IT) or information systems (IS). The pedagogical emphasis

of the CIS curriculum is on the practice of IT and IS. As an instructor facing such a challenge, the author searches for pedagogies that are appropriate to the students so they are able to heuristically understand how mathematical equations can be applied in modern cryptography and cryptographic programming.

This paper contains three sections to meet this challenge: (a) the first section discusses properties of algebraic and transcendental equations; (b) the second section describes how to use quadratic equations in sample encryption and decryption algorithms; and (c) the third section illustrates how to develop instructional materials to guide students through their hands-on coding projects. This section also identifies issues, barriers, and opportunities that must be addressed when using such encryption and decryption algorithms, and provides a sample assignment. These sections are followed by a conclusion that reiterates how mathematically struggling students can benefit from learning basic cryptography using algebraic and transcendental equations.

Why Algebraic and Transcendental Equations?

Decryption is the general term used to describe the reverse operation of encryption. If the encryption mechanism is a one-to-one function, $f(x) = y$, then the decryption mechanism is the inverse, $g(y)$, of the selected mathematics equation. In mathematics, a function, $f(x) = y$, is a one-to-one function only when it satisfies the condition – every unique value of x as input of f can only produce a unique output y. In other words, for any given x, there is only one y that can be paired with that x in the form of f$(x) = y$. An inverse is a function that performs the opposite operation by using the value of y as input to yield the original value of x, and is denoted as $g(y) = x$, or $f^{-1}(y) = x$.

Many algebraic and transcendental expressions can be written as one-to-one functions; therefore, their inverse functions also exist. An algebraic equation is an equation that includes one or more variables and often consists of a combination of algebraic operators (Britannica, 2015). Transcendental equations are equations that cannot be expressed in algebraic terms. These are the exponential, trigonometric, logarithmic equations, and their corresponding inverse equations (Weisstein, 2015). Such a function-inverse relationship provides an opportunity to create encryption and decryption mechanisms.

Polynomials occupy a prominent position in cryptography (Elia, 2011). Polynomials form a subset of algebraic equations. They are typically expressed in the form $ax^n + bx^{n-1} + \ldots + px + q$, where the integer n is called the degree (Britannica, 2015). A linear function contains the linear polynomial, since $y=ax+b$. Quadratic functions involve the second degree (quadratic) polynomials, and cubic functions contain the third degree polynomials. On the other hand, studies have proven the feasibility to produce ciphertexts using transcendental numbers (Pieprzyk, Ghodosi, Charnes, & Safavi-Naini, 1996; Viswanath, 2014). It is relevant, too, for college instructors to teach cryptographic programming based on algebraic and transcendental equations. *Table 1* is a sample list of functions and their inverses.

Table 1: Sample Function and Their Inverses

\	Polynomial	Exponentiation	Logarithm	Trigonometry
Function	$y = f(x) = 2x - 1$	$y = f(x) = \sqrt[15]{x}$	$y = log_a(x)$	$y = Sin(x)$
Inverse	$x = g(y) = \frac{y+1}{2}$	$x = g(y) = y^{15}$	$x = a^y$	$x = Sin^{-1}(y)$
Example	$y = 2\times65 - 1 = 129$	$y = \sqrt[15]{65}$	$y = log_2(65) = 6.0223678$	$y = Sin(65°) = 0.90630779$
	$x = \frac{129+1}{2} = 65$	$x = (65^{1/15})^{15} = 65$	$x = 2^{6.0223678} \cong 65$	$x = Sin^{-1}(0.90630779) \cong 65°$

Note: The "crackability" which describes the degree of easiness a cryptographic algorithm can be cracked, of using these sample functions for encryption is disregarded because this table only demonstrates how they apply the teaching of basic concept of cryptographic programming.

In the *Table 1*, the author uses an ASCII code 65 as the value of x to demonstrate the computation from x to y and y back to x. This attempt attests the practicability of using the basic algebraic and transcendental equations in cryptography. It is necessary to note that *Table 1* disregards the "crackability," which describes the degree of easiness a cryptographic algorithm can be cracked, of these sample functions. However, it is necessary to discuss with students, in a class meeting, the "crackability" of using algebraic and transcendental equations for encryption and decryption.

A Sample Use of Quadratic Equations in Encryption and Decryption

The following is a sample of algorithms proposed by the author in teaching basic cryptographic programming. The algorithm uses quadratic equation and its solution formulas for encryption and decryption. Aufmann, Barker, and Lockwood (2003) define the term quadratic equation as an equation of the standard form $ax^2 + bx + c = 0$ with $a \neq 0$. The following illustrates how to find the roots of x by completing the square.

$$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$$

$$x^2 + \frac{b}{a}x = -\frac{c}{a}$$

$$\left(x + \frac{b}{2a}\right)^2 = -\frac{c}{a} + \frac{b^2}{4a^2} = \frac{b^2 - 4ac}{4a^2}$$

$$x + \frac{b}{2a} = \frac{\pm\sqrt{b^2 - 4ac}}{2a}$$

Solving for x yields the following formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

If the discriminant b^2-4ac is negative $(b^2-4ac < 0)$, there are no real solutions of the equation because the computation of the square root of a negative number requires the use of at least one complex number. On the other hand, when using a quadratic function, $f(x) = ax^2 + bx + c$ to produce a harsh-like value h because $h = ax^2 + bx + c$. By limiting a condition that x must be a positive integer, the equation $ax^2 + bx + (c - h) = 0$ will always have a positive solution x and unwanted condition, $b^2-4ac < 0$, is avoided because x is an integer. By the way, since the solution formula should be obtained based on $ax^2 + bx + (c - h) = 0$, the solution formula is therefore:

$$x = \frac{-b \pm \sqrt{b^2 - 4a(c-h)}}{2a}$$

There exists an interesting phenomenon: when a is positive $(a>0)$, $\frac{-b+\sqrt{b^2-4ac}}{2a}$ is always the desired inverse value. When a is negative $(a<0)$, $\frac{-b-\sqrt{b^2-4ac}}{2a}$ is always the desired inverse value. Therefore, the one-to-one relationship can be expressed as: given $f(x) = ax^2 + bx + c = 0$ *with* $a \neq 0$, then the desired

$x = \frac{-b-\sqrt{b^2-4ac}}{2a}$ if a < 0, where the term "desired x" is the positive value produced by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Apparently, the quadratic equation meets the requirement for cryptography: only when the result of calculation based on the selected mathematical equation can be inversed back to its original value, the selected mathematical equation and its inverse qualify for use as encryption and decryption mechanisms.

The proposed algorithm contains two segments: encryption and decryption. The encryption algorithm is performed by a given quadratic equation. The decryption algorithm is the opposite of encryption, which is performed by the inverse of the quadratic equation. Their core concepts are expressed in *Table 2*.

Table 2: Code Concept of Proposed Algorithm

Encryption Algorithm	Decryption Algorithm
Let Me be $ax^2 + bx + c$ with $a > 0$	Let D be $g(f(x))$
Convert P to get x $C = E(f(x)) = E(ax^2 + bx + c)$	Solve $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ with $x \geq 0$ $D(x) = D(\frac{-b \pm \sqrt{b^2 - 4ac}}{2a})$ Convert x to get P

Note: The pseudocode only illustrates the relationship between encryption and decryption.

In order to teach the above algorithm, the author has prepared the instructional material and learning activities to discuss the above mathematics foundation at a workable level. The instructional material also explains the practicality of using the quadratic equation as an encryption mechanism. In the next section, the author will discuss the chosen algebraic and transcendental equations and the development of instructional material and learning activities to guide the students in creating simple encryption and decryption applications.

Developing Instructional Materials with Hands-On Coding Projects

As of the time this paper was written, the author was not able to find any appropriate textbook; therefore, the author developed instructional material to guide students through their hands-on coding projects for the following purposes: (a) to heuristically learn how mathematics equations apply to modern cryptography; (b) to eliminate the time and efforts spent on learning advanced mathematics concepts; (c) to focus the learning process on programming skills; and (d) to immediately see the programming results. *Table 3* lists the lecture topics of the developed instructional materials. Let f^{-1} be the inverse function of a given function f. Among the topics, the cubic equation is the most difficult one in terms of mathematical complexity. Due to its complexity, its inverse equation is provided in *Appendix A*. The inverse function of distance equation is lengthy and is available in *Appendix B*.

In trigonometry, the angle, θ, may be measured in degrees or radians. It is necessary to explain to students that "radian" is the standard unit of angular measure, used in computational mathematics including programming. The conversion can be done by

1 radian = $\frac{180}{\pi}$ degrees, and 1 degree = $\frac{\pi}{180}$ radians.

Programming languages, such as Java, C# and C++, provide mathematical functions to return the value of trigonometric functions and their inverses. Since the angle, θ, measured in radians, such that $-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$, instructors can discuss how to use $\sin\theta$ and $\tan\theta$ and their inverse functions, $\sin^{-1}\theta$ (arcsine) and $\tan^{-1}\theta$ (arctangent), for encryption and decryption.

Details of the development of instructional materials are arranged in sequence of: (a) contents of handouts, (b) "crackability" of the proposed algorithms, (c) turning the "crackability" to a learning opportunity, (d) sample assignments, and (e) barriers and issues.

Table 3: Instructional Topics

Lecture	Topics	Sample Functions	Inverse Function
1	Algebraic equations/Linear equation	$f(x) = ax + b$	$f^{1}(x) = \frac{x-b}{a}$
2	Quadratic equation	$f(x) = ax^2 + bx + c = 0$	$f^{1}(x) = \frac{-b \pm\sqrt{b^2-4ac}}{2a}$
3	Cubic equation	$f(x) = ax^3 + bx^2 + cx + d = 0$	See *Appendix A*
4	Distance equation	$d = \sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$	See *Appendix B*
5	Transcendental Exponentiation	$f(x) = \sqrt[a]{x}$	$f^{1}(x) = x^a$
6	Logarithm	$log_a(x) = y$	$x = a^y$
7	Trigonometry	$cos(x \times \frac{\pi}{180}) = y$	$x = cos^{-1}(y / \frac{\pi}{180})$

Note: All equations are categorized as algebraic and transcendental.

Contents of Handouts

Each handout consists of three components: main context, learning activities, and programming exercises. In the main context, the author briefly introduces the design concept of proposed algorithm, discusses the mathematical equation that serves as the foundation, illustrates the programming implementations with sample codes, reveals the weaknesses, and shares the ideas to strengthen the proposed encryption and decryption mechanisms. The author demonstrates the sample codes in classroom before guiding students through the learning activities. Similar in-class demonstrations may be taped as video-on-demand (VOD) movie clips for students of online or distance-education courses to the review purpose. Each learning activity produces a pair of functioning applications: encryption and decryption applications. Students can immediately test them with paragraphs of string text (plaintext), compare the plaintext with ciphertext, and verify the reversed plaintext with the original one. The programming exercises consist of one to three coding projects for students to individually develop a pair of encryption and decryption applications with their innovations or optimizations. The following is a sample code, written in Visual C++, that demonstrates to students how to use the cosine (cos) and arccosine (cos^{-1}) for encryption and decryption.

```
/// Trigonometry
#using <System.dll>
#using <System.Windows.Forms.dll>

using namespace System;
using namespace System::Windows::Forms;

double getHash(double x)
{
 x = x/2;
 return Math::Cos(x * Math::PI / 180); }

int inverse(double y)
{
 double x = (Math::Acos(y) /
(Math::PI/180)) * 2;

 if (x - (int) x > 0.5) { return
Math::Ceiling(x); }
 else { return Math::Floor(x); } }
[STAThread]
int main() {
 Console::WriteLine("Plain\tx\tHash\tx\
tPlain");

 Char p1, p2; // plaintext;
 double y;
 int x1; // inversed x
 for (int x=0; x<256; x++) {
  p1 = Convert::ToChar(x);
  y = getHash(x);
  x1 = inverse(y);
  p2 = Convert::ToChar(x1);
  Console::WriteLine(p1+"\tx="+x+"\
ty="+y+"\tx="+ x1 +"\t"+p2);
 } }
```

Figure 1: y = cos(x)

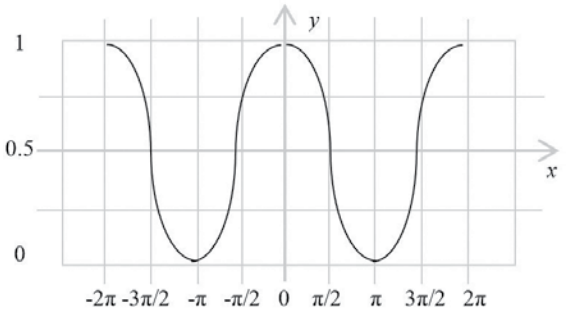

Figure 1: Values of cosine repeat every 2π (or 360 degrees)

Students need to know a mathematical phenomenon that the outputs of cos(x) will repeat every 2π or 360 degrees when x is either a radian or a degree of a given circle. *Figure 1* illustrates the change of value of y in the form of $y = cos(x)$. Possible values of y are bound to two domains of x, $0° \leq x < 180°$ (or $0 \leq x < \pi$) and $180° \leq x < 360°$ (or $\pi \leq x < 2\pi$), depending on what x represents (either a degree or a radian). Each domain of x produces the same domain of y. Half of the y values are positive, and the other half are negative, and satisfy $-1 \leq y \leq 1$. For example, $cos(60°) = 0.5$ and $cos(300°) = 0.5$. In order to satisfy the requirement for being a one-to-one function, the author must use only one domain of x, for example $0° \leq x < 180°$. In other words, the encryption mechanism limits the value of x to come either from $0° \leq x < 180°$ or $180° \leq x < 360°$, but not both. Interestingly, with only one domain of x, when the value of x increments by $1°$, y can have only 180 different values. However, the 8-bit ASCII defines a total of 256 characters with the character code ranging from 0 to 255. It takes 256 different values of y to support the encryption of ASCII codes.

In the above code, the author purposely lets $x = \frac{x}{2}$ before performing the $y = cos(x)$ operation inside the getHash() function. As a result, there are 360 possible values of y with x belonging to the $0° \leq x < 180°$ domain. In the inverse() function, the author lets $x = cos^{-1}(y) / \frac{\pi}{180} \times 2$. Such a special arrangement is to demonstrate to a student how a programmer can tactically resolve the technical issues.

"Crackability" of the Proposed Algorithms

The author adopts the term "crackability" to describe how easy the encryption mechanism can be cracked by an "unattempted user." As a matter of fact, encryption mechanisms with simple algebraic and transcendental equations have high "crackability." The reasons are: (a) these equations and their inverses are well known; (b) reversing computations are relatively easy; (c) cracking codes are liable to develop; and (d) many of them can only apply to symmetric-key encryptions. These weaknesses make the "crackability" of the proposed algorithm high. It is necessary to inform the students of these inherited weaknesses.

Table 4 compares the encryption code with a sample cracking code. The encryption is based on a function $f(x) = \sqrt[12345]{x}$ or $f(x) = x^{1/12345}$. The getHash() function converts a character to a hash-like value, such as 1.00035702761123. By the way, the .Net Framework required the Math.Pow(double x, double $power$) function to specify the power parameter as double, while x can be implicitly converted from int to $double$.

Through the discussion of "crackability," the author can invite students to discuss the relationship between cryptography and hacking. On one hand, to be able to crack passwords and encrypted protocols such as SSL and wireless, hackers need to, at least, be familiar with the concepts and terminology of cryptography and encryption. On the other hand, cryptography programmers must be able to identify the weakness of cryptography in order to respond to the flaws.

Turning the "Crackability" to a Learning Opportunity

With the identified weaknesses of the proposed algorithms, the author encourages students to brainstorm possible solutions to lower their "crackabilities." One way to strengthen these proposed algorithms is to use "customized character codes," as shown in *Figure 2*, in which each alphabet, numeral, and punctuation is assigned a randomly picked number, such as 859 for "A," 265 for "7," and so on.

Other possible ways include cascading encryption (or encryption cycling) and lengthy key. The term "cascading encryption" refers to the process of encrypting an already encrypted ciphertext one or more times, to increase implementation complexity. Using lengthy key size against a "brute-force" trial-and-error search is another option. However, programmers must find a balance point between the key size and computation time. For example, with every doubling of the RSA key length, decryption is 6-7 times slower (Coffey, 2012). The author also encourages students to develop their methodologies to harden these algorithms.

Table 4: Encryption vs. Cracking Codes

Encryption Code	Cracking Code

`public static double getHash(char c)`
 	
`{`
`int x = (int) c; // char to ASCII`
`return Math.Pow(x, 1.0/12345.0);`
`}`
	`public static void crackHash(double y)`
	`{`
	`int x;`
	
	`for (int i = 0; i<100000; i++) {`
	`x = Convert.ToInt32(Math.Pow(y, i));`
	`if (x >= 256) { break; }`
	`else {`
	`Console.WriteLine(Convert.ToChar(x));}`
	`  }`
	`}`

Note: Both sample codes are simplified and they only demonstrate the functionalities and methodologies.

Figure 2: Customized Character Code Chart

Char	A	B	C	D	E	F	G	H	I	J	K	L	M
Code	859	432	617	594	261	830	136	781	326	274	918	623	471
Char	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Code	198	683	557	362	419	734	209	611	799	537	816	267	232
Char	0	1	2	3	4	5	6	7	8	9	.	,	space
Code	854	682	593	829	137	798	208	265	622	266	418	233	556

Note: Programmers can randomly assign character code of any length (preferably 3 or more digits) to harden the encryption and decryption.

Sample Assignments

In spite of the fact that the handouts contain many sample codes to illustrate the underlying concepts, and the hands-on learning activities guide the students throughout the coding, the author designs hand-coding assignments for students to apply their critical thinking and problem-solving skills to design and development of cryptographic applications. These problems use variations of the discussed algebraic or transcendental equations; therefore, students can apply the newly learned skills to create one encryption and one decryption application that are deemed challenging, yet appropriate, for their skill levels. The author avoids the problems that can frustrate students. *Table 5* is a sample assignment with its grading criteria, algorithm, and solution. It is necessary to note that the solution code only demonstrates how the "sample algorithm" works to students.

Additionally, assignments must be submitted on time to be acceptable, although some extension might be considered for those who encounter problems. Unacceptable projects will receive zero points.

Table 5: Sample Assignment

Item	Description
Assignment question	Given a function, $f(x) = log(x-3)$, develop an encryption and a decryption algorithm, and then use these algorithms to create simple applications in any programming language of your choice to implement these algorithm.
Grading criteria	Students' primary task is to create a working application for encryption and a working application for decryption based on the cryptographic algorithm using the given equation. The submitted work must meet the following criteria: • **Originality.** Must be the student's original work. • **Workability:** Do the applications perform the required tasks? The required applications must compile and run on an acceptable platform in an acceptable language. Non-working programs will be returned for corrections with an appropriate penalty. • **Accuracy.** The required applications must accept legal input and produce correct output as specified in the problem description. • **Organization:** Is the code structure well arranged? • **Clarity:** Are the codes easily readable? • **Efficiency:** Has the algorithm been optimized?
Sample algorithm	Let $y = log(x-3)$. Interchange x and y such that $x = log(y-3)$. Therefore, $e^x = y - 3$, where e is the Euler's number, a constant approximately equal to 2.718281828459. Re-arrange the formula to $y = e^x + 3$ or $f^{-1}(x) = e^x + 3$ as the inverse.

Instructor's sample solution	`using System;`
	`public class Encryption`
	`{`
	`public static double encryptIt(int x)`
	`{`
	`return Math.Log(x-3);`
	`}`
	`public static double decryptIt(double x)`
	`{`
	`return Math.Pow(2.718281828459, x) + 3;`
	`}`
	`public static void Main()`
	`{`
	`Console.WriteLine("Plaintext\tCipher\tPlaintext");`
	`double y;`
	
	`for (int x = 3; x<256; x++)`
	`{`
	`  y = encryptIt(x);`
	`  Console.WriteLine(x + "\t" + y + "\t" +`
	`Convert.ToInt32(decryptIt(y)));`
	`  }`
	`  }`
	`}`

Note: Instructors can furnish a guideline to specify the requirements of hands-on programming assignment.

Barriers and Issues

Cryptographic programming is not yet a required topic for the CS (computer science), CE (computer engineering), SE (software engineering), CIS (computer information system), or IST (information systems and technologies) curricula. Although there are several high-quality published books available, as listed below, their target readers are apparently not the kind of mathematically less prepared students enrolled in the author's courses.

- Seacord, R. (2013). *Secure coding in C and C++* (2nd ed.). Boston, MA: Addison-Wesley Professional.
- Stallings, W. (2013). *Cryptography and network security: Principles and practice* (6th ed.). Upper Saddle River, NJ: Pearson.
- Ferguson, N., Schneier, B., & Kohno, T. (2010). *Cryptography engineering: Design principles and practical applications.* New York, NY: Wiley.
- Welschenbach, M. (2005). *Cryptography in C and C++.* New York, NY: Apress.
- Viega, J., & Messier, M. (2003). *Secure programming cookbook for C and C++: Recipes for cryptography, authentication, input validation and more.* Newton, MA: O'Reilly Media.

At a practitioner-oriented college, students are more prone to use Microsoft's Visual Studio and are less familiar with the standard C++ and C. Additionally, depending on the students and the course's curricular issues, the author needs to teach cryptographic programming in different languages, including Visual C++, Visual C#, and Java. Finding sample codes from the opened sources for students to review and study, such as published book and the Web, is a significant barrier to overcome.

The cost, schedule, technology, and pedagogy are four constraints that tie the author's hands when teaching cryptographic programming. Asking students to purchase additional learning materials, tools, and equipment is probably not a feasible option. Spending most time to learn complicated mathematics and advanced programming skills is an impractical luxury in an accelerated course. Engaging students in hands-on coding projects to build GUI (graphical user interface) applications is a much more effective way to teach programming topics, rather than the discussion of theories (Yang, Kizza, Wang, & Chen, 2011). The author must always find a balance point among the above constraints. *Table 6* lists the issues and the author's proposed solutions.

Conclusion

Through experimental lecturing of how simple algebraic and transcendental equations apply to design, development, and implementation of encryption and decryption mechanisms, the author was able to teach basic cryptographic programming to mathematically less prepared students. Without the discussion of advanced and complicated mathematics, the author turns a boring and frustrating lecture to a more interesting and enjoyable one. By focusing more on hands-on coding projects, students can benefit from (a) learning the instructional content at the level they can comprehend, (b) visualizing how mathematical equations apply to development of encryption algorithms, (c) relating their learning journey to real-world coding projects, and (d) experiencing how an existing algorithm can be creatively innovated or optimized. To instructors of accelerated courses at practitioner-oriented colleges, using simple algebraic and transcendental equations to teach cryptographic programming is an effective and efficient pedagogy.

Table 6: Issues and Solutions

Constraint	Issue	The Author's Solution
Cost	No additional cost allowed	• Develop instructional materials and hands-on learning activities. • Use free tools, such as Notepad, Visual Studio Command Prompt (not its IDE), and Java Development Kit.
Schedule	Classes last for only 8 or 9 weeks	• Focus on demonstrating how to apply simple mathematical equations to the coding of encryption and decryption. • Allocate more lecture time to in-class live coding demonstration to help students visualize the coding process.
Technology	Most students are under-prepared in mathematics and programming skills	• Provide simple and functional sample code. • Avoid lengthy coding projects. • Avoid time-consuming coding projects.
Pedagogy	Cryptographic programming is an abstract, theoretical, and frustrating topic	• Engage students in hands-on coding projects that allow them to immediately see the results. • Avoid using complicated equations. • Avoid the discussion and proofs of advanced algorithms.

Note: These solutions are proposed based on the author's best practices and empirical findings

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Appendix A: Solving a cubic equation

This appendix is an integral part of *Table 3* which illustrates how the inverse function of a generic cubic equation works.

To solve a cubic equation, $ax^3 + bx^2 + cx + d=0$ is converted to $\frac{a}{a}x^3 + \frac{b}{a}x^2 + \frac{c}{a}x + \frac{d}{a} = 0$, and then simplified to $x^3 + \frac{b}{a}x^2 + \frac{c}{a}x + \frac{d}{a} = 0$. Let $p = \frac{b}{a}$, $q = \frac{c}{a}$, $r = \frac{d}{a}$ so the cubic equation can be expressed as $x^3 + px^2 + qx + r = 0$.

Let $Q = \frac{3q - p^2}{9}$, $R = \frac{9pq - 27r - 2p^3}{54}$, $S = \sqrt[3]{R + \sqrt{Q^3 + R^2}}$, *and* $T = \sqrt[3]{R + \sqrt{Q^3 + R^2}}$ so the solution of $x^3 + px^2 + qx + r = 0$ can be expressed as the following formulas, where i is the imaginary unit, satisfying the condition $i^2 = -1$, of a complex number that can be expressed in the form of $m + ni$ with m and n being two real numbers.

$$r_1 = S + T - \frac{1}{3}p$$

$$r_2 = -\frac{1}{2}(S+T) - \frac{1}{3}p + \frac{1}{2}\sqrt{3}(S-T)i$$

$$r_3 = -\frac{1}{2}(S+T) - \frac{1}{3}p - \frac{1}{2}\sqrt{3}(S-T)i$$

Since the character code must be a real number, r_2 and r_3 can always be eliminated; therefore, r_1 is the demanded answer.

Appendix B:

This appendix is an integral part of *Table 3* which explains how to design a cryptographic implementation as an inverse function to a generic distance equation.

With known $x1$, $y1$, $x2$, $y2$, one can form a line equation in the form of $ax + by = c$ using $m = \frac{y2 - y1}{x2 - x1}$.

However, there is a problem that needs programmers' attention, as shown below. For a given line, there are two possible points $B1$ and $B2$ that have the exactly same distance (d) to another point A. Assuming A is $(x1, y1)$, $B1$ is $(x2, y2)$, and $B2$ $(x3, y3)$, then

$$d = \sqrt{(x1 - x2)^2 + (y1 - y2)^2} = \sqrt{(x1 - x3)^2 + (y1 - y3)^2} \quad .$$

To specify which of $B1$ and $B2$ is the selected point, the author defines a rule by adding a variable, s, of int type to indicate the "side" that can resolve this issue.

Figure A1: Two points with same distance to another point

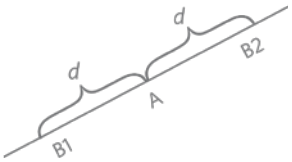

Figure A1. There are two points (B1 and B2) on a given line with exactly the same distance to another point (A).

Finally, use the following for cryptography.

- Public key: $(a, b, c, x1, y1, s)$ or simply $(a, b, x1, y1, s)$ because $(x1, y1)$ and (a, b) can derive c. Using d with some mathematical calculation to encrypt. For example, $n^e = d$ for encryption and its inverse function, $e = log_n d$, for decryption.
- Private key: $(x1, y1, x2, y2, d)$ or simply $(x2, y2)$

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Relationship between Leadership and Community of Practice (CoP) Manifestations: A Meta-Analysis

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Abstract

Communities of Practice (CoPs) are groups of individuals who share a passion and meet informally to solve problems related to a discipline through the dimensions of community (e.g., collaboration), domain (e.g., common purpose), and practice (e.g., innovation). CoPs are informal and organic by nature with champions voluntarily sponsoring improvement projects. Attempts to appoint CoP leaders could become a risk for institutionalization, a phenomenon that transforms CoPs into traditional groups, delaying creativity and innovation. However, literature has evidenced that leadership can influence CoP behaviors. A meta-analysis of 110 articles in the literature from 2001 to 2015 aimed to confirm whether significant relationships existed between leadership and the CoP dimensions of community, domain, and practice, reporting studies from 19 countries in nine different industries. Statistical analysis through *p-value* demonstrated a significant relationship between *leadership*, *community*, and *practice* at a 95% confidence level, but a non-significant relationship in the dimension of *domain*.

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Keywords: communities of practice (CoP), leadership, CoP model, CoP dimensions

The proliferation of Web 2.0 technologies has removed barriers for communication, allowing practitioners to exploit cross-cultural opportunities for innovation. These opportunities for collaboration combined with the presence of culturally diverse groups increase team high-performing capabilities (West, 2009). Stories of successful collaboration, like the creation of the Linux software (Lee & Cole, 2003), demonstrate how collaborative participation among field experts can promote progressive learning and creative solutions. Considered part of the new culture of Wikinomics (Tapscott & Williams, 2010), collaborative models with power (e.g., Wikipedia, YouTube) have become fertile ground for innovations, inventions, new solutions, the creation of value, and the advancement of a global vision while supported by technological platforms.

Capitalizing on the promises of collaborative networks, numerous organizations around the world (from local to multinational) have adopted Communities of Practice (CoPs) to promote innovation among working groups (Stuart, 1993). This renewed interest for peer-collaboration is accompanied by a CoP theory disseminated during the last 25 years, with Wenger et al. (Wenger, 2004; Wenger, McDermott, & Snyder, 2002; Wenger & Snyder, 2000) as main contributors. CoPs have been described as "...groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al., 2002, p. 4). The dynamic behaviors of CoP members happen in the three dimensions of community (e.g., social collaboration), domain (e.g., sense of common purpose), and practice (e.g., innovation).

CoPs are spontaneous networks of collaborators. CoPs are not formal departments, operational teams, or business units. However, because of their common interest to improve an area of expertise, CoP members position themselves close to the core knowledge of many fields. Organizations with the interest of capturing, categorizing, and disseminating knowledge could take intentional steps to formalize CoPs, initiating a process of *institutionalization* (Wenger, 2004), introducing formal guidelines to make CoP custodians of a body of knowledge. Professional organizations like the International Society for Pharmaceutical Engineering and multinational organizations like Caterpillar are known for providing continual support to CoPs with the objective of keeping knowledge repositories available to communities of practitioners. In professional organizations, CoPs have a strong voice in driving topics of discussion on diverse industries.

The dynamic collaboration inside CoPs happens through a process of reflective collaboration and shared identity influenced by mediating leadership behaviors (Saldana, 2014). Although recent CoP studies acknowledge the mediating influence of leadership in the success of CoPs from different disciplines, leadership is not part of the CoP theoretical model. In the meantime, leadership expressions continue manifesting in the CoP research. Examples of these leadership manifestations include individualized motivation that contributes to successful knowledge outcomes (Retna & Ng, 2011), strong collaboration networks as a success factor in different industries (Borzillo, Schmitt, & Antino, 2012), and referent and expert powers that influence membership behaviors (Weaver, Pifer, & Colbeck, 2009).

Purpose

The purpose of this meta-analysis was to synthesize the results of CoP literature from 2001 to 2015 to confirm a significant relationship between leadership, and the three dimensions of a CoP (i.e., community, domain, practice) with the objective of proposing a renewed CoP model. A revised CoP social structure (see *Figure 1*) was proposed with leadership as a CoP mediating influence (Saldana, 2012; 2014; 2016). By acknowledging the role that leadership occupies in knowledge creation, organizations promoting CoPs will overcome the challenges of leveraging community spontaneity with the legitimization of structures.

Figure 1. Revised CoP Social Structure

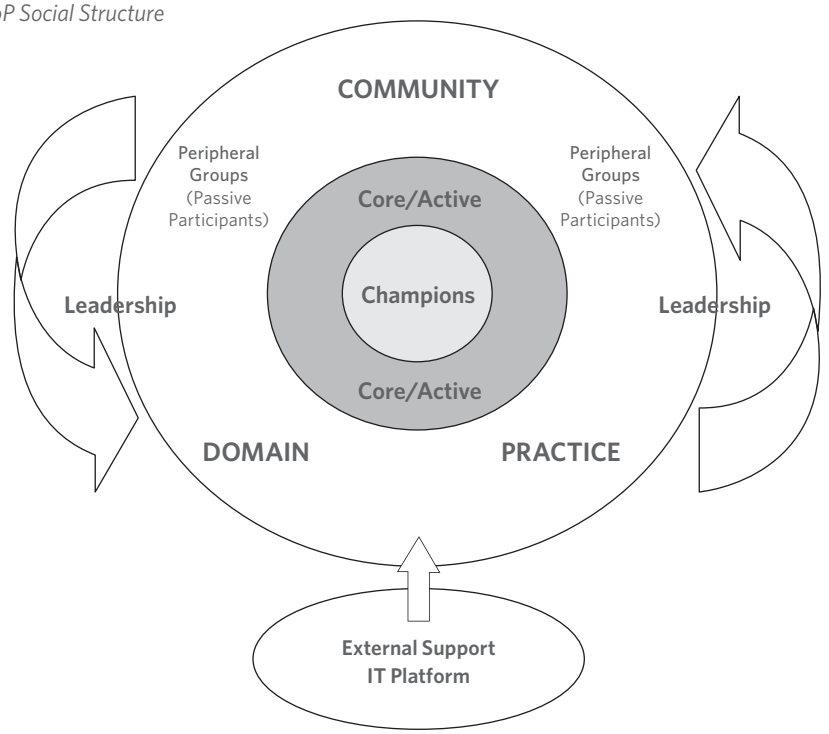

Figure 1. Revised CoP social structure as suggested in previous research. Figure is adapted from "Comparison of community, practice, domain, and leadership expressions among professional communities of practice," by J. B. Saldana, 2014, Dissertations & Theses @ University of Phoenix; ProQuest Dissertations & Theses Full Text, p. 10.

CoP Theoretical Background

The *communities of practice* theory acquired scientific relevance during the 1990s when Jean Lave and Etienne Wenger (1991) published *Situated Learning: Legitimate Peripheral Participation* to describe the interactions of professional groups seeking common solutions to everyday problems. However, theories about interconnected practitioners solving problems can be traced to *invisible colleges* (Crane, 1971), *epistemic communities* (Adler & Haas, 1992), and *learning communities* (Senge, 1993). In general, all these community models of practice share characteristics like common interests, voluntary participation, informal networks, knowledge replication from practical ideas, cohesive working, problem-solving capabilities, and dissemination of practices (Saldana, 2014).

Historically, when problems arise to the level of concern among groups of practitioners (especially during a crisis state), these groups intervene to generate scientific progress. Wenger and Lave (1991) suggested that theories of knowledge have in common the factor of *situatedness*, in which individuals respond to historical situations by generating novel solutions. *Situatedness* is one of the fundamental philosophies behind Wenger et al.'s (2002) concept of CoPs: an interplay between participants, situations, and work contexts. CoP members achieve innovation by social interactions that evolve into the production and dissemination of knowledge through community, practice, and domain dimensions, which consequently promote membership and cohesion (Wenger & Snyder, 2000).

Leadership and the CoP

Considerable literature in the last 15 years reported leadership manifestations as part of CoP outcomes. For example, a systematic review of the CoP literature (Saldana, 2014) documented significant manifestations represented as motivation, trust, visible apprenticeship, embedded leadership roles, shared leadership, referent and expert power, recognition, empowerment, self-efficacy, dyadic relationships, and empathy. Other scholars have suggested that leadership interactions influence the quantity and quality of work of the CoP (Borzillo et al., 2009). Additional leadership variables observed in CoP studies included idealized influence, motivation, extrinsic and intrinsic rewards (Lee, Kim, & Suh, 2014), and individualized consideration and trust (Beaumont, Stirling, & Percy, 2009).

Wenger et al. (2002) introduced the concept of champions to describe those responsible for initiating CoP projects. However, reuniting members with expertise is not enough to promote innovation. Anand, Gardner, and Morris (2007) reported that CoP members confront obstacles in attracting expert members, accessing communication platforms, and creating social processes and routines to promote innovation. Among professional communities, innovation and dissemination of knowledge happen when novel practitioners replicate methods sponsored by champions. Leadership expressions, such as mentoring and coaching play a fundamental role in the development of CoP networks. Wenger et al. (2002) identified mentoring dynamics as capable of promoting sustainability and distributing workload burden among CoP memberships.

Additional leadership expressions, such as dyadic relationships, unconditional trust, and motivation are evident at the practice and domain dimensions and align with theories of pro-social contexts (Penner, Dovidio, Piliadin, & Schroeder, 2005). The prosocial theory explains the tendency among CoP members to unify efforts (e.g., cooperative volunteering) when crises or new problems arise. This phenomenon is observable during national emergencies or natural disasters (e.g., 9-11 terrorist attacks, Hurricane Katrina), in which practitioners of a field manifest prominent collaboration, identifying creative solutions to the challenges present. Dane (2010) defined *cognitive entrenchment* as the ability of CoP members to develop new mental schemes.

Simultaneously, leadership is a mediating influence in the development of CoP memberships, as power relationships influence closeness centrality, or the amount of interactions and engagement among members at the core of the community (Ranmuthugala et al., 2011). This influence permeates the three dimensions of the CoP (i.e., community, domain, and practice). Individualized consideration is the transformational leadership behavior that empowers members of the community to enact socialized agency that generates mechanisms for innovation (Dionne, Yammarino, Atwater, & Spangler, 2004). Transformational leadership expressions (Bass & Riggio, 2009), such as idealized influence, intellectual stimulation, and inspirational motivation can explain the level of cohesiveness achieved by the CoP during critical moments, often ending in industry change.

Hypotheses

Hypotheses in this meta-analysis aimed to confirm significant relationships between leadership (as constant variable) and three CoP dimensions (community, practice, and domain expressions).

The hypotheses that guided the analysis of existing indicators were:

R_1, R_2, R_3: A relationship exists between [*leadership* and *community*] [*leadership* and *practice*] [*leadership* and *domain*] manifestations in the available CoP literature from 2001 to 2015.

R_0: A relationship does not exist between [*leadership* and *community*] [*leadership* and *practice*] [*leadership* and *domain*] manifestations in the available CoP literature from 2001 to 2015.

Definition of the Variables

This meta-analysis analyzed the statistical significance of the variables leadership, and the CoP dimensions community, practice, and domain. Multiple manifestations were used to confirm the presence of each of these variables (see *Appendix A*).

Leadership

Wartburg and Teihert (2006) identified the transformational leadership model as a suitable paradigm to explain how CoPs perform because volunteers who advance industry practice are inspired by the attributes of transformational leaders, which include the highest moral standards, character, and integrity. Behaviors such as idealized influence, intellectual stimulation, individualized consideration, and inspirational motivation (Bass & Riggio, 2009) manifest and influence the way CoP members produce, steward, and disseminate knowledge. Cargill (2006) emphasized that leadership is a mediating factor in the performance of CoPs through negotiation, informal agreements, and followership.

Community

Community is the CoP dimension that defines activities that practitioners execute on a regular basis. Wenger and Snyder (2000) described that community possesses a quality of *closeness centrality* or the stretching of links and relationships to evolve from a simple network to a mature CoP with a common purpose and core competencies. As the social fabric in which experts collaborate expands, the dimension of community assists in intensifying cohesion.

Figure 2. The Research Variables' Relationships

Figure 2. This figure exemplifies the proposed relationship between leadership manifestations and community, domain, and practice manifestations during the completion of a meta-analysis. Appendix A demonstrates taxonomies of leadership, community, domain, and practice manifestations as compiled before on Comparison of community, practice, domain, and leadership expressions among professional communities of practice," by J. B. Saldana, 2014, Dissertations & Theses @ University of Phoenix; ProQuest Dissertations & Theses Full Text.

Practice

According to Wenger (2004), practice represents shared expertise. Furthermore, the practice dimension explains how members of communities with similar expert interests combine their epistemic realities with context, knowledge, language, cognition, and experience to produce creative solutions, capable of promoting socio-technical advantage despite geographic dispersion (Noriko, 2006). In Wenger's vision, practice is the dimension that corresponds to structural capacities to steward and disseminate knowledge.

Domain

Wenger et al. (2002) described domain as the articulation of a common purpose among practitioners by the production and dissemination of knowledge through time. The domain dimension allows CoP members to add value continually by creating methods to share both explicit and implicit knowledge (Nicholls, 2006). Although not directly related to domain, CoP members develop a shared identity through joint enterprise, and common working methods, artifacts, stories, and practices that contribute to the growth and maturity of the CoP.

Meta-Analysis Method

A meta-analysis is a systematic compilation of results from previous studies. Vogt (2007) recommended using meta-analysis to confirm the presence of repetitive variables and to identify emergent trends. An important aspect of the meta-analysis is the effect of size on results; thus, it is important to select (a) the correct statistical tool and (b) a consistent and representative sample. Screening criteria for articles included seven indicators, as specified in the flowchart shown in *Figure 3*.

Figure 3. The Process of Meta-analysis

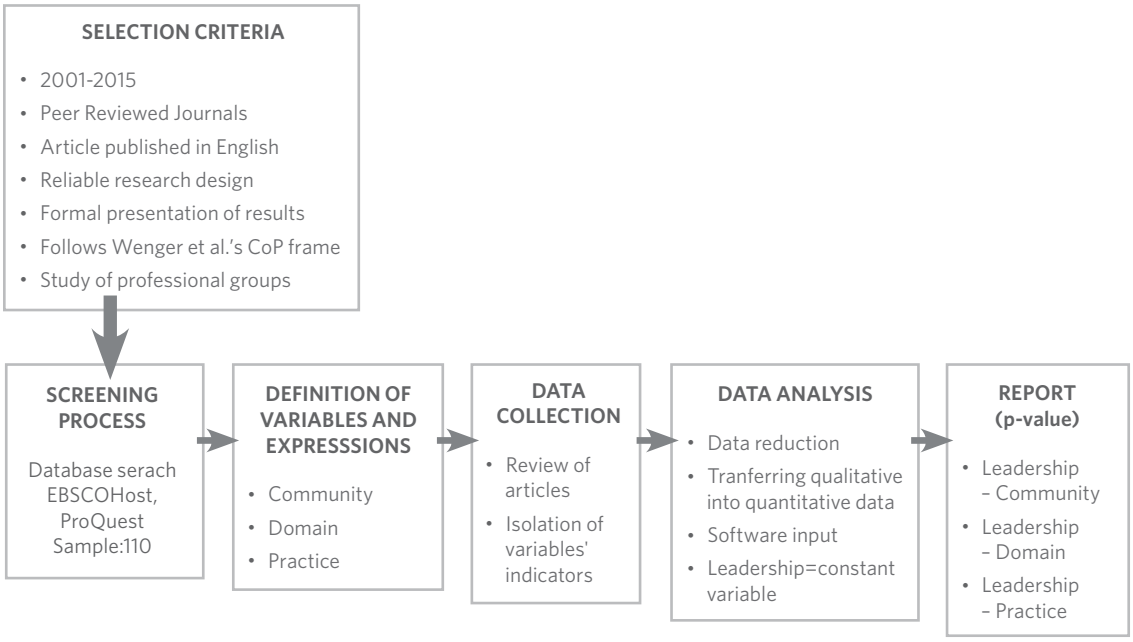

Figure 3. The process of meta-analysis encompassed isolating manifestations under the categories of community (15 expressions), domain (13 expressions), practice (13 expressions), and leadership (13 expressions) (see Appendix A*), and transferring them into quantitative data through statistical software (SPSS23 [IBM] and CMA [Biostat]). This Flowchart explains the selection criteria and meta-analysis process through a process of screening, variables' definitions, data collection and analysis and analysis of p-value associating leadership expressions to community, domain, and practice manifestations separately.*

Meta-Analysis Results

Descriptive Results

A vast majority of the identified studies represented qualitative methodologies (70.9%) (see *Table 1*), including case studies, ethnographies, action research, and grounded theory. A smaller amount of studies were completed as quantitative (17.3%) and mixed research designs (11.8%).

Table 1: Research Results by Methodology

	Method	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Qualitative	78	70.9	70.9	70.9
	Quantitative	19	17.3	17.3	88.2
	Mixed Method	13	11.8	11.8	100.0
	Total	110	100.0	100.0	

The systematic compilation of 110 research designs encompassed studies from 2001 to 2015, with the majority of studies published between 2009 (21.8) and 2010 (29.2), for a cumulative percentage of 51% (see *Table 2*). Please note that the researcher could not identify articles within the criteria of inclusion (i.e., peer reviewed, published in English, reliable research design and presentation of results, use of Wenger et al.'s CoP frame, and study of professional groups) for years 2002 and 2004.

Table 2: Research Studies by Publication Year from 2001 to 2015

	Method	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2001	1	.9	.9	.9
	2003	2	1.8	1.8	2.7
	2005	5	4.5	4.5	7.3
	2006	4	3.6	3.6	10.9
	2007	9	8.2	8.2	19.1
	2008	18	16.4	16.4	35.5
	2009	24	21.8	21.8	57.3
	2010	32	29.1	29.1	86.4
	2011	3	2.7	2.7	89.1
	2012	4	3.6	3.6	92.7
	2013	2	1.8	1.8	94.5
	2014	3	2.7	2.7	97.3
	2015	3	2.7	2.7	100.0
	Total	110	100.0	100.0	

In addition, results reflected the presence of CoPs in more than 20 countries, with a majority of CoPs located in the United States (30%) and the United Kingdom (18.2%). Other geographic areas represented (see *Figure 4*) were multinational locations (17.3), and Canada (4.5%). Industries repeated with more frequency within the 110 research designs were arts and education (39.1%), technology (18.2%), and management consulting firms and government/ public services with 10% each (see *Figure 5*).

Figure 4. Distribution of Research Studies by Country

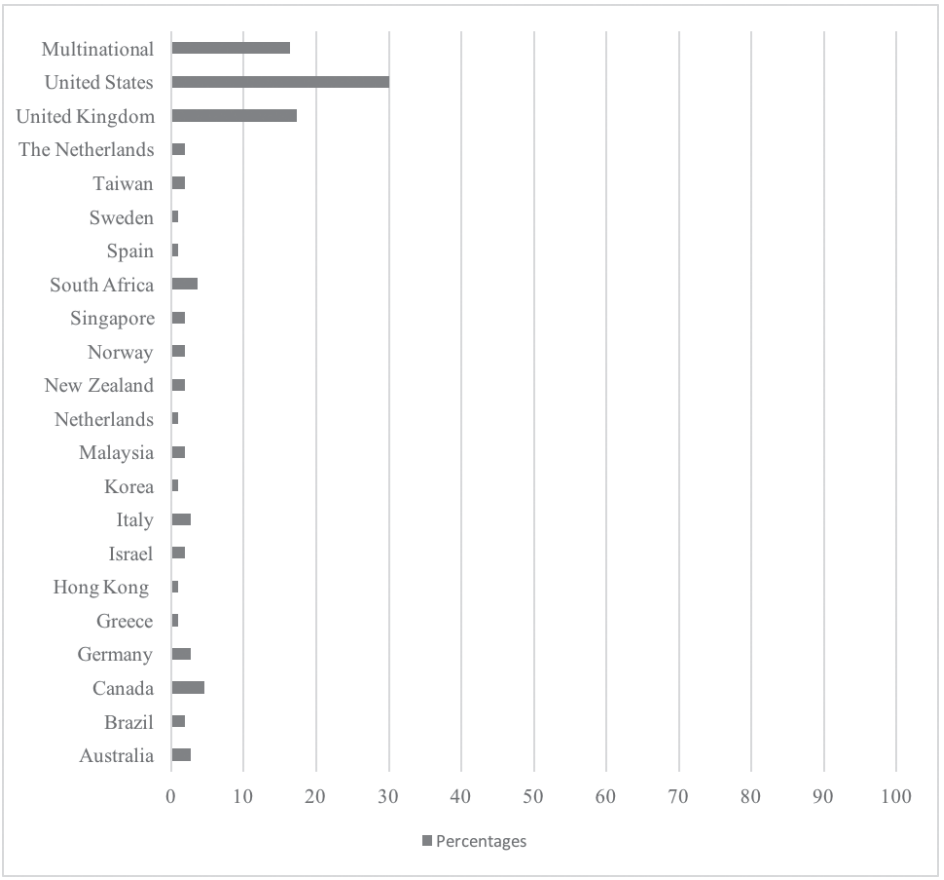

Figure 4. This figure shows the distribution of 110 research studies by country of origin, although all articles were published in English. Research in each of the articles referenced professional groups in these geographic locations.

Figure 5. Distribution of Research Studies by Industry

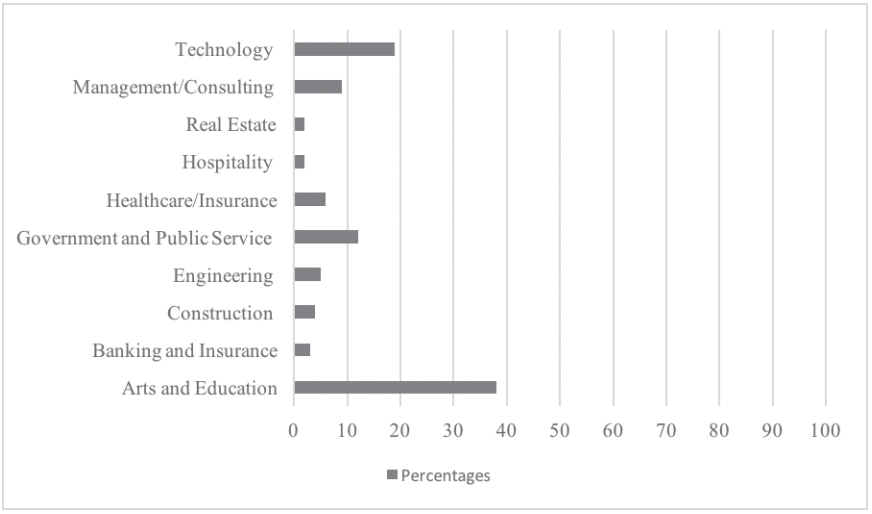

Figure 5. This figure shows the distribution of research studies by industry in a compilation of 110 articles about professional groups interacting in CoPs.

The research results of this meta-analysis demonstrated that a relationship between leadership and community, practice, and domain manifestations were significant at two of the CoP dimensions (community and practice), but non-significant at the domain dimension (see *Table 3*).

Table 3: Statistical Results of CoP Meta-Analysis

						Leadership = Constant
Dimension	**odds ratio**	**lower limit**	**upper limit**	**z-value**	**p-value**	**Fail to Reject**
Community	1.3376766	1.049450086	1.705063283	2.34979792	0.019	Yes
Domain	0.9230590	0.704878346	1.208773171	.58189607	0.561	No
Practice	1.4243781	1.115126741	1.819392394	2.83252139	0.005	Yes

(1) In the hypothesis, "A relationship exists between *leadership* (as a constant variable) and *community* manifestations in the available CoP literature from 2001 to 2015," significance levels reflected .019 < .050, for which the study rejected the null hypothesis. Based on this statistical analysis, it can be inferred that leadership demonstrates a strong relationship with community manifestations at a minimum 95% confidence interval (see *Figure 6*).

Figure 6. Relationship between Leadership and Community Manifestations

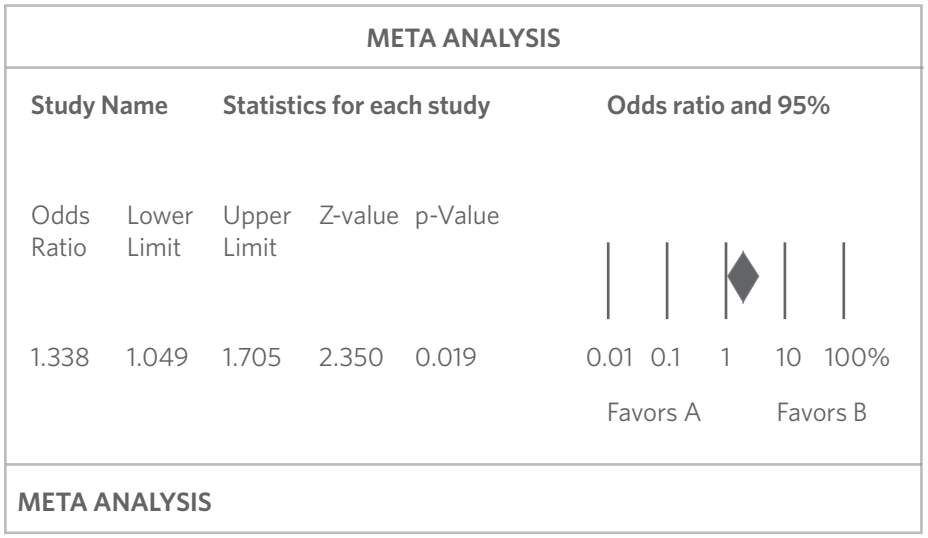

Figure 6. This figure is a Forest Plot representation of the relationship between leadership manifestations and community manifestations among 110 CoP research articles from 2001 to 2010, in which 1 means no relationship. The calculation of p-value reflected of 0.19, below .050 (at the level of significance), which can lead to the rejection of null hypothesis.

(2) In the hypothesis, "A relationship exists between *leadership* (as a constant variable) and *domain* manifestations in the available CoP literature from 2001 to 2015," significance levels reflected 0.561> 0.5, for which the study failed in rejecting the possibility of relationship at a minimum 95% confidence interval (see *Figure 7*).

Figure 7. Relationship between Leadership and Domain Manifestations

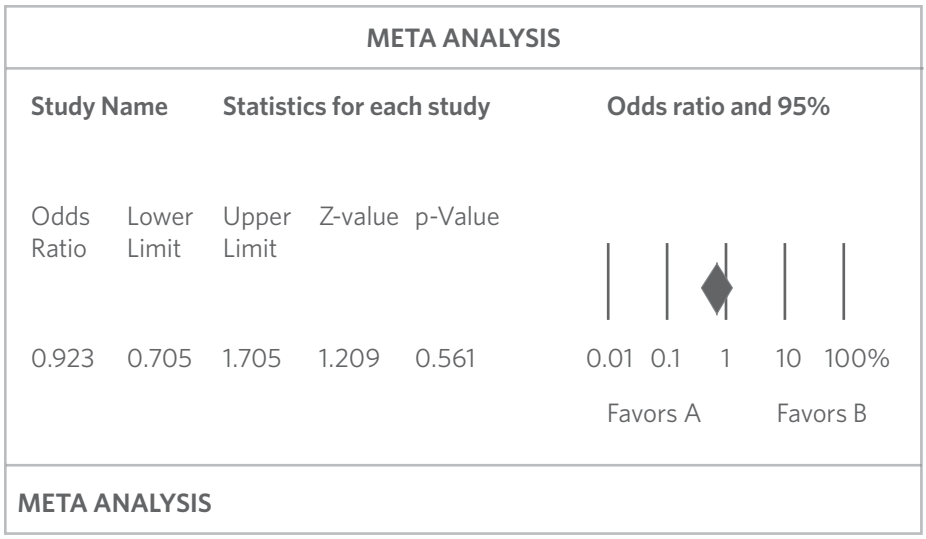

Figure 7. This figure is a Forest Plot representation of the relationship between leadership manifestations and domain manifestations among 110 CoP research articles from 2001 to 2010, in which 1 means no relationship. The calculation of p-value reflected of 0.561, above .050 (at the level of significance), which does not allow the rejection of null hypothesis.

In the hypothesis, "A relationship exists between *leadership* (as a constant variable) and *practice* manifestations in the available CoP literature from 2001 to 2015," significance levels reflected .005 < .050, for which the study rejected the null hypothesis. Based on this statistical analysis, it can be inferred that leadership shows a strong relationship at a minimum 95% confidence interval (see *Figure 8*).

Figure 8. Relationship between Leadership and Practice Manifestations

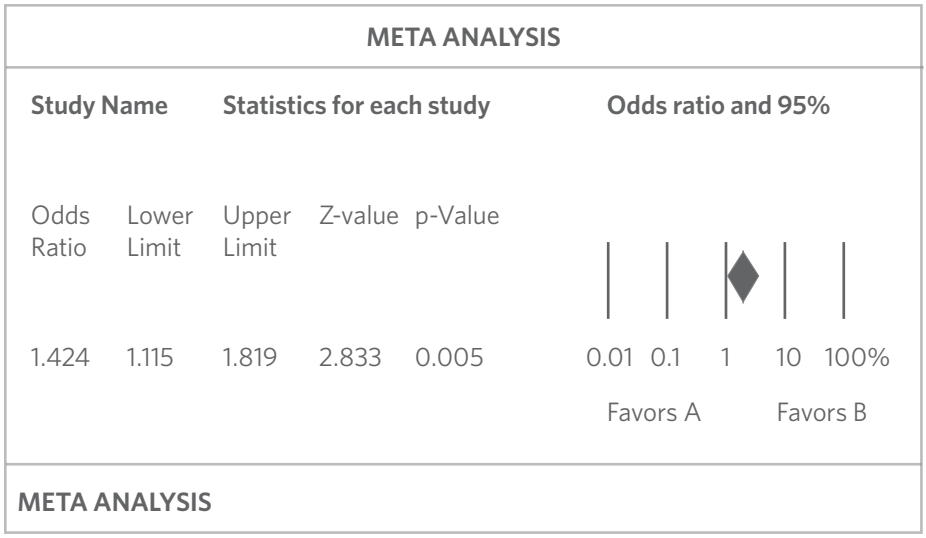

Figure 8. This figure is a Forest Plot representation of the relationship between leadership manifestations and practice manifestations among 110 CoP research articles from 2001 to 2010, in which 1 means no relationship. The calculation of p-value reflected of 0.005, below .050 (at the level of significance), which can lead to the rejection of null hypothesis.

Discussion of Results

A renewed CoP model was introduced to incorporate leadership as a mediating influence on the development of a community of practitioners. A meta-analysis aimed to confirm the relationship between leadership and the three CoP dimensions of community, domain, and practice. The descriptive results of this study reported that the majority of the articles in the CoP literature were of qualitative nature (almost three to one), although the sample of articles reflected a broad spectrum of countries (19) and industries (nine different sectors) represented. On the other hand, most articles observed within the inclusion criteria reflected an influx of publications from 2007 to 2010, with 2010 being the year with the greatest number of identified articles (32 publications).

A relevant finding in this meta-analysis is confirmation that leadership can be a mediating influence consistently over community of practice, but not over the domain dimension of the CoP, so that leadership influences collaboration and innovation but not a sense of common purpose. These findings seem to align with a previous study in which leadership was demonstrated to have a mediating influence over CoPs in different states of the lifecycle in the dimensions of community or practice but not over domain (Saldana, 2014), as confirmed through the application of multivariate ANOVA. It was concluded that members of the CoP would sustain the same level of belonging regardless the time developmental stage of that community.

Implications for Managers Promoting CoPs

CoPs have shown to be useful in driving strategy, generating problem-solving tools, disseminating best practices, building expertise, and recruiting and retaining talent (Wenger et al., 2002). However, creating sustainable conditions for the flourishing of these innovation incubators is never easy to predict. While not intervening would be the best strategy for allowing the community to develop organically, it is evident that the cultivation of leadership behaviors is associated with increased knowledge sharing. The risk of institutionalization increases when CoP managers attempt to intervene to enhance community outcomes. CoP managers must work strategically by ensuring championship of initiatives and technological resources without interrupting the way the CoP evolves.

Furthermore, the distinctive voice of the community should be the main driver of ideas. Maintaining the balance between tight and loose-coupled processes is necessary to ensure the CoP advances in a way natural to the subject matter field. Although tight-coupled processes can support structures for members to learn from their experiences and construct meaning by drawing from previous knowledge, loosely coupled structures give participants ample decision-making latitude to interpret and implement solutions while developing common sense (Holmström & Boudreau, 2006).

Simultaneously, transformational leadership expressions, such as inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration (Bass & Riggio, 2010) seem to inspire and motivate CoP members to suggest new ideas. However, CoP managers cannot intervene in the way leadership evolves or control the personality traits of the membership. Exposing champions to leadership theory could enhance the capacities of those in charge of igniting and sustaining knowledge projects.

Recommendations for Future Research

Stewardship of knowledge is one of the gray areas of CoPs. Not all communities recognize stewardship as part of their activities, and those who cultivate stewardship see this activity as emerging in the maturity stage (Wenger et al., 2002). CoP managers can help communities maintain repositories of knowledge from which members can draw information to make decisions. Producing knowledge as the outcome of a CoP is not enough; CoP members must be able to store and retrieve knowledge to sustain innovation (Price, 2005). Knowledge management processes encompass integrating the totality of knowledge, and anticipating future need to increase performance and innovation.

Moreover, results from previous systematic reviews of CoP literature (Saldana, 2012) suggested that the existing technologies are also mediating factors in supporting CoP members to create, steward, and disseminate knowledge in many fields, such as education (Hew & Hara, 2009), government (Venters & Wood, 2007), technology (Lee & Cole, 2003), and knowledge management (Griffith & Sawyer, 2006). Customized web-based platforms like GENEX have been created to help CoPs build knowledge upon previous knowledge, ignite creativity, refine social processes, and disseminate new practices (Kipp, Wieck, Bretschneider, & Leimeiste 2013). Although Schlager and Fusco (2003) emphasized that web-based technologies alone are not conducive to industry innovation, research continues to validate the role of technology in CoP collaboration and innovation alike (Dixon, 2010).

Finally, CoPs consistently reflect 80/20 participative ratios, with 80% of the community members acting as peripheral participants and 20% of the community members serving as champions of knowledge initiatives. Studying the motivations of individuals to become CoP champions is another area of study necessary to understand the influence of individuals who serve as links between CoPs, peripheral communities, and organizational forums, and to integrate more CoP members to existing projects to accelerate progress and innovation.

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Appendix A: Taxonomy of Leadership, Community, Domain, and Practice Manifestations

Taxonomy of CoP Leadership Manifestations

	Frequency	Percent	Valid Percent	Cumulative Percent
Dyadic Relationships	1	.5	1.4	1.4
Embedded Roles/Behaviors	7	3.4	9.5	10.8
Empathy	1	.5	1.4	12.2
Empowerment	2	1.0	2.7	14.9
Influenced Performance	22	10.6	29.7	44.6
Leadership Recognition	3	1.4	4.1	48.6
Motivation	9	4.3	12.2	60.8
Referent/Expert Power	5	2.4	6.8	67.6
Shared Leadership	7	3.4	9.5	77.0
Self-Efficacy	2	1.0	2.7	79.7
Trust	8	3.9	10.8	90.5
Visible Apprenticeship/Mentoring	7	3.4	9.5	100.0
Total	**74**	**35.7**	**100.0**	
System	**133**	**64.3**		
Total	**207**	**100.0**		

Taxonomy of CoP Community Manifestations

	Frequency	Percent	Valid Percent	Cumulative Percent
Autonomy	8	3.9	5.6	5.6
Embedded Communication Paths	10	4.8	7.0	12.7
Face-to-face Meetings	4	1.9	2.8	15.5
Improved Communication	3	1.4	2.1	17.6
Long-Term Relationships/Sociability	13	6.3	9.2	26.8
Low conflict	3	1.4	2.1	28.9
Peripheral & Informal Groups	8	3.9	5.6	34.5
Self-Organization	6	2.9	4.2	38.7
Mutual Engagement/Connectivity	17	8.2	12.0	50.7
Participation	3	1.4	2.1	52.8
Peer-to-Peer Support/Collaboration	8	3.9	5.6	58.5
Reflective Collaboration	27	13.0	19.0	77.5
Reduced Silos Effect	3	1.4	2.1	79.6
Spontaneous Networking/ Pre-Existing Networks	24	11.6	16.9	96.5
Teamwork Spirit	5	2.4	3.5	100.0
Total	**142**	**68.6**	**100.0**	
System	**65**	**31.4**		
Total	**207**	**100.0**		

Taxonomy of CoP Domain Manifestations

	Frequency	Percent	Valid Percent	Cumulative Percent
Cultural Sensitivity	2	2.2	2.2	2.2
Culture Transfer	3	3.3	3.3	5.5
Embedded Identification	6	6.6	6.6	12.1
Embedded Professional Roles	6	6.6	6.6	18.7
Egalitarian Culture	4	4.4	4.4	23.1
Negotiated Enterprise	12	13.2	13.2	36.3
Professional Identity	10	11.0	11.0	47.3
Produced Artifacts	11	12.1	12.1	59.3
Sense of Common Purpose	13	14.3	14.3	73.6
Shared History/Produced Stories	12	13.2	13.2	86.8
Shared Repertoire	4	4.4	4.4	91.2
Use of Organizational Policies	8	8.8	8.8	100.0
Total	**91**	**100.0**	**100.0**	

Taxonomy of CoP Practice Manifestations

	Frequency	Percent	Valid Percent	Cumulative Percent
Best Practices	13	6.3	6.3	6.3
Building New Skills	12	5.8	5.8	12.1
Solutions/Knowledge Creation	37	17.9	17.9	30.0
Flexibility to Learn and Change	8	3.9	3.9	33.8
IT as Enabler of KM	30	14.5	14.5	48.3
KM Processes	14	6.8	6.8	55.1
Knowledge Dissemination/Transfer	16	7.7	7.7	62.8
Collective Improvement	21	10.1	10.1	72.9
Managerial Support	5	2.4	2.4	75.4
Shared/Situated Learning	34	16.4	16.4	91.8
Structured Goals/Activities	11	5.3	5.3	97.1
Facilitators & Training	6	2.9	2.9	100.0
Total	**207**	**100.0**	**100.0**	

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Troublesome Citations: Academic Literacy in a Community of Practice

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Abstract

Faculty can define "academic integrity" not as an absence or prevalence of cheating, but as "academic literacy" and create learning material that will help students to write within an academic community of practice. This paper explores the theory of students as adult learners who are negotiating with threshold concepts in terms of the genre of "research writing" that is the primary means of communication within the university as a community of practice. The paper offers solutions to implement across the curriculum and suggestions about how to help students to grow from the pre-liminal space that they occupy as academic writers. Finally, the paper discusses the faculty's role in helping students move from pre-liminality toward liminality and progression toward mastery of the social practice of academic writing.

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Keywords: academic integrity, research writing, pedagogy, communities of practice

Although the university stresses academic integrity, especially in regard to preventing plagiarism through the fair, accurate, and correct use of outside sources, faculty concur that undergraduate students are not sure how to synthesize or document the sources that they have brought into their written work. Students know from classroom directives that they must create papers that look a certain way — the way that APA (American Psychological Association) papers look. In order to provide a framework for redressing the problem, the university can rephrase it: "The research paper" is the primary means of communication among people in the academic community, and undergraduates — as pre-liminal communicators who understand only some aspects of the genre — might have difficulties understanding how to write and create the research paper as a message that communicates what other writers have said about a subject and what they themselves have to say. Then, faculty can grasp the problem: Students have to gain literacy as participants within the academic community. Faculty can teach "academic integrity" not as an absence or presence of cheating, but as "academic literacy"; that is, as the ethical way that students and scholars communicate, share ideas, and create new knowledge through discourse.

McCabe, Butterfield, and Treviño (2012) have found that many contemporary students do not think that plagiarism — narrowly defined here as "copying language from another printed source to use in one's own paper" — is tantamount to academic dishonesty. About a decade earlier, McCabe, Treviño, and Butterfield (2001) found that students in 1993 defined "plagiarism" more loosely than students had in 1963, although the incidents within their study groups numbered nearly the same.

Beyond copying language verbatim, students in several studies did not recognize that paraphrased or summarized material must be cited, as well (Power, 2009; Yeo, 2007). Speaking to the problem of academic literacy's lack of a place within the university curriculum, Power (2009) found that instructors warned students against plagiarism during the first week of classes, but typically did not offer students any further instruction about using sources.

The academy exists, in part, as a means of managing knowledge, and having students consult and learn from published sources is part of that management project. Within the academic community, messages that transmit ideas are the currency of knowledge, and those messages comprise rhetoric — the interplay and contest of different ideas. Rhetoric is epistemic (Smith, 1998), and rhetorical methodologies dispense knowledge to students in order to teach students their disciplines' purposes and the big questions that academic fields of study seek to answer.

Thus, education is more than skills transfer; it is the capacity to participate in a conversation centered on theories, concepts, and facts. The university could express its highest purpose in the solid language of learning objectives centered on rhetoric-as-epistemic: "Given a problem to solve within one's area of educational expertise, be able to communicate a solution using one's knowledge of how to craft messages for audiences and the ability to synthesize new ideas from information exchanged with and learned from others via intellectual exchanges made through reading, speaking, and listening."

Having students participate in learning through research asks that they have the ability to create proper in-text citations and a References page in order to give credit to authors whose works they have used, argued against, and used as support for the ideas they communicate in their educational projects, which are part of the project of higher education. An "academic literacy" approach to teaching students how to use sources as messages for ideas asks that faculty give students strategies for examining source material, promote an attitude in favor of learning, and teach the capacity to transfer the material that students have learned, both from class to class, plus, more importantly, to the world outside the academy. Teaching the use of sources as the communications-based foundation of our community of practice and teaching APA as the language that we use to communicate ideas will help students to understand the proper use of sources as a threshold concept within our community of practice.

Community of Practice

Wenger and Trayner (2015) define a community of practice as a group of people who interact regularly in order to share a passion or concern, and they become better at it as they interact on a regular basis. One of the key markers of a community of practice is the "domain": the shared area of interest, and, it follows, a shared commitment to that domain, which results in "a competence that distinguishes members from other people" (Wenger & Trayner, 2015, p. 2). Another pair of markers is the community and the practice. In the community, members communicate about their practices in regard to the shared interest; the practices are learned through concentrated communications and messages that become shared resources.

Practices are the "tricks of the trade," and a committed community meets regularly to communicate what they have learned and to add to the repertoire of tricks while learning from it. A community of practice is formed.

Any classroom can become a community of practice whose members are committed to performing research, learning from sources, and drafting their own messages about the fields they are studying. Research projects offer fertile ground for cultivating a community of practice around the practice of research.

Weber-Wulff (2014) uses Charles Babbage's 1830 declaration about these means of misusing research-based ideas. Interestingly, Babbage talks about nineteenth-century science as a community of practice whose members — "the initiated" — knowingly commit academic misdemeanors and frauds:

> [t]here are several species of impositions that have been practised [sic] in science, which are but little known, except to the initiated, and which it may perhaps be possible to render quite intelligible to ordinary understandings. These may be classed under the heads of hoaxing, forging, trimming, and cooking. (as cited in Weber-Wulff, 2014, p. 17)

Babbage's effort to define terms for "ordinary understandings" show him as a translator, stepping outside of his community of practice in order to warn outsiders about scientifically unsound, yet oft-used "tricks of the trade" that he has learned from his community of practice. Some of Babbage's tricks are common among undergraduates who have not absorbed the methods of research as a threshold concept for entering the academically literate community of practice. In terms of undergraduate student-writers who need more conversation on using sources with peers in their community of research practice and classroom instruction from faculty:

- *Forging* is making up information to go into a research project;
- *Trimming* is manipulating information by getting rid of parts that are not useful to a research hypothesis or thesis;
- *Cooking* is selecting only information that backs up what one already believes.

Cousin (2006) sums up all of these acts of copying, plagiarizing, hoaxing, forging, trimming, and cooking: they are the "product of ritualised [*sic*] performances rather than integrated understandings" (p. 5). The challenge for faculty in this community of practice is to help students bypass the stage of creating products that are ritualized performances evidenced by a naïve or uninformed use of research.

Threshold Concepts

A question from faculty members is "How can we ensure that students make progress out of their pre-liminal understanding of research as 'collecting sources to shove into a paper' and connect its methodology and methods to their learning process in every class they take?" The first level of helping students to achieve literacy within disciplines is to consider the threshold concepts that are important in their fields. Meyer and Land (2006b) write that threshold concepts are "'conceptual gateways' or 'portals' that lead to a transformed view of something" (p. 19) and go on to describe the discursive nature of threshold concepts: "The acquisition of transformative concepts...brings with it new and empowering forms of expression that in many instances characterise [*sic*] distinctive ways of disciplinary *thinking*" (p. 20). Discovering those threshold concepts in disciplines requires that faculty work back to an emergent understanding of important ideas: How did one think about one's major as an undergraduate? What did undergraduates learn that opened minds to a new state of comprehension, to a new way of interacting with the knowledge of one's discipline? By questioning one's own practices and interviewing one's colleagues in order to ask them to recall their pre-liminal states and how they mastered threshold concepts in their fields of study, faculty can come into touch with the important concepts that help to unfold a discipline for students.

Meyer and Land (2006b) offer several examples of threshold concepts in different fields. They quote a professor of medieval history who claims that a threshold concept in his discipline is getting students to understand how business had to be transacted in person — even by the king himself — in medieval European societies, "...impressing upon students how little could be done in this society, even by people of power, without them actually getting on their horse or whatever and going and seeing someone else, and dealing with and impressing people face to face" (p. 20). Absorbing that idea, one can understand how vital personal, physical relationships were among people and how important verbal communication was in medieval Europe, where a person's word truly was his or her bond — a concept that has lessened in importance in contemporary society, where people have virtual relationships with others whom they have never physically met, written contracts drafted by anonymous attorneys are binding, and verbal, face-to-face agreements can have limited value.

Threshold concepts are, at once, abstract, yet fundamental apprehensions of ideas that are crucial to comprehending the basics of a field of study. They build a foundation that allows students' understanding of their disciplines to expand, giving them the capacity to create new ideas and concepts of their own that are grounded by an advanced comprehension of what their disciplines accept as given truths. APA is the language for using and citing the sources that researchers use to show the path that their understanding has followed, and having one language to use helps to bring all writers, in every discipline, into the academic community of practice.

Pre-liminality and Liminality

Akin to Shanahan and Meyer's (2006) description of economics students' remaining at a naïve level of understanding about the basic, yet necessary concept of "opportunity cost" from freshman year until graduation day, undergraduate student-researchers-writers can stay at a naïve understanding of research. In this naïve position, research to students can mean looking for sources that say something that support one's preconceived viewpoint on a topic; finding one or two sources and pulling out some quotations to use so that sources simply exist in the paper; and/or finding a source that the student understands well enough to mimic in tone and structure.

The university stresses APA, at its simplest, as a means of documenting sources and preventing the most egregious type of plagiarism: copying-and-pasting language and taking unattributed ideas. Yet APA is a doorway to the methodology of research as the communication of ideas among scholars in a discipline. Since the undergraduate classroom is the first realm where the language of research as a discipline is required of students, APA as the *lingua franca* of academia is a threshold concept for the majority of students. Meyer and Land (2006a) write, "A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something" (p. 3). If faculty treat the proper APA use of sources — including reading,

note-taking, and writing about the process of engaging with academic writing — as a threshold concept toward academic literacy, the university can achieve the goal of helping students to become academically literate by applying the dual concepts of students as participants in a community of practice and liminal learners on the threshold of understanding concepts that are vital to their practices as academics and lifelong learners.

Land, Cousin, Meyer, and Davies (2004) describe "liminality" as having several conditions:

- A *transformative* state that engages existing certainties and renders them problematic, and fluid
- A *suspended* state in which understanding can approximate to a kind of mimicry or lack of authenticity
- An *unsettling* — sense of loss

Students experience liminality in terms of a transformative state, where they must take the writing abilities that they bring to their university experience and transform them into models of academic literacy, in terms of researching sources and writing with APA documentation. Students move from their transformative state into a suspended state, where they mimic the academic writing that they encounter, including mimicked or even copied-and-pasted APA citations, but not synthesizing the source material that they are quoting, summarizing, and paraphrasing. Finally, students know that they are not wholly academically literate through just using APA, and they are unsettled by the understanding that research is more than forging, trimming, and cooking.

Faculty can help students through the liminal phase. By promoting research, including its documentation, as a concern within the committed community of practice that defines the university, faculty can help students to progress from a liminal state with their knowledge to a position of academically literate participants in the university's project of managing and communicating knowledge.

Curriculum Developments and Instructional Strategies

Spinuzzi (2003) writes about the ways in which people use their own agency to solve problems, reflecting back to Aristotle's notion of *techne*, based on the philosopher's observations about the way that master craftsmen are able to use their own judgment in order to "bend the rule" through experience and expertise in order to serve a larger goal. If a learning objective is that students become fluent with the APA language of the academic community of practice, then faculty can make space in the curriculum for students to become able to act under their own agency to practice the forms of research and documentation that comprise APA, the language of their community of practice.

Integrating an instructional design process to how faculty guide their classrooms can offer steps to take in ushering students through liminality and threshold concepts to become academically literate participants in their community of practice. The steps in an instructional design framework are pre-instruction, presentation, participation, assessment, and transfer.

Pre-instruction: APA Crib Sheets

A task that faculty can work on with students is the creation of their own APA reference citation "crib sheet," drafted by students and corrected by the instructor. The goal is to have the student create a list of APA reference citation types that s/he is likely to encounter in his or her writing for the class. Thus, students would create their own artifacts for research writing and begin to become fluent with the genre of source citation, a fundamental vocabulary item within the language of research.

Presentation: Response Papers

In order to give students an opportunity to use their APA crib sheets, the majority classes should require students to do research in one specific library database (Points of View), read articles that have opposing points of view on important topics, and write in response to the intellectual challenge of considering deeply opposing perspectives and situating oneself as a reader, researcher, and respondent who writes as an academically literate user of texts.

By integrating response-based reading and APA-cited writing into their classes, faculty can move student writing away from a liminal state, where students mimic research writing as a genre. In this exercise, students will

1. engage in a research process to gather articles on a subject that is important to them and — importantly — that they are thinking about in terms of an audience which they will address through their own writing;
2. read published essays that have conflicting, oppositional points of view to one another and, probably, to some of the student's preconceptions;
3. write response essays that describe their;
   - 3.1. ideas about their topics when they first approached the Points of View database;
   - 3.2. reading and note-taking processes as they read the introductory articles in Points of View;

3.3. how they expanded their understanding of threshold concepts through
  3.3.1. the process of doing library-based, academic research;
  3.3.2. the experience of encountering various perspectives on the topic that challenged their opinions;
3.4. what research process they used as they sought any further peer-reviewed information on their topic;
3.5. what they learned through;
  3.5.1. doing library-based, academic research;
  3.5.2. engaging with ideas on an important topic and reading and digesting oppositional points of view.

The Points of View database available through the library contains discussions of topics that can be tailored to any course of study. With their self-created APA crib sheets in hand, students can read and take accurately cited notes to use in their papers — which means that they will be working at the level of participants in a research-oriented community of practice.

Participation: Discussion Boards

The online course shell can become a place where students find support for their confusion as they encounter and move through their liminal states. Faculty can use discussion board questions, in particular, to elicit talk about any confusion. Faculty can ask questions that encourage students to record their problems with creating APA crib sheets and the research and reading processes as they engage in a dialectical approach to their learning through the Points of View response paper assignment.

The goal of facilitated discussions about students' intellectual growth into a liminal state where they begin the process of mastering the research-writing process is to avoid what Cousin (2006) warns against: "if students are stuck in a pre-liminal state for too long, they may resort to mimicry or indeed plagiarism to get them through the course" (p. 5). Online discussions should ask students to write in a low-risk genre, which is posting on the discussion board, about any confusion they have about the intellectual process of research and writing and to talk with their classmates about shared struggles.

The discussion board, in this iteration of participation, becomes the location of the classroom as a community of practice. Students come together as committed researchers and writers, sharing tips and "tricks of the trade" to better the practice of the entire group. More advanced students who are mastering parts of the research process can offer their ideas to students who are still at the pre-liminal or threshold levels, and the community enhances the learning of all participating students and empowers the group in their work.

As many faculty know, the classroom is becoming increasingly globalized. Students might not come from cultures that share Western concepts of textual ownership. Teaching academic literacy allows faculty to not only focus on the proper way to use sources, but it opens a perspective for students to learn from one another about how to enter into academic discourse and the exchange of ideas within a discipline. Teaching academic literacy to international students gives them the ability to move from pre-liminality and mimicry of academic texts to a more full participation in the discourse, lending their ideas from different backgrounds to the overall conversation.

Assessment: Research Papers

Students' self-created APA crib sheets and research can go on to work hand-in-hand throughout their academic careers. Sequenced classes within disciplines allow the curriculum to take students on a journey. Students can research, read, respond, and revise their exploration and response papers from the Points of View database into fully researched and articulated, twenty- to twenty-five-page research papers. As students move from their pre-liminal state in their chosen fields of study to emergent experts in their areas of special interest, their written work will show their level of increased literacy in the academic community of practice.

Transfer: Broadened Research-writing Assignments

In order to help students gain literacy with the genre of research writing, assignments in course shells can be designed to take students to databases within EBSCOhost that offer more peer-reviewed material that is aligned to disciplines. The various databases in EBSCOhost offer the option of searching by journal; therefore, assignments can lead students to specific journals that are at the forefront of academic disciplines. Students can become academically literate by devising search terms that find the results that they need — another step toward overall literacy within the research genre of writing.

Faculty can engage in the community of practice as gatekeepers and guides by checking every written assignment for evidence of the vocabulary of academic literacy: correct APA citations and a synthesized use of source material that was used to create new ideas — rhetoric as epistemic (Smith, 1998). Indeed, student writing should be subjected to the same detailed, careful overview of research documentation and style as writers who submit their essays to journals for publication. The university can back that effort by

including standardized rubrics in every class, setting out the same criteria for grading APA documentation throughout the institution, keeping in mind that the APA citation is the vocabulary for the university's community of practice and research methodology.

Conclusion

Engaging with APA as an academic language is a threshold concept that students come to grips with. Through a better grasp of the grammar of research, students will become better researchers, more in touch with the methodology of research and ready to cross the threshold and become more capable of researching in their chosen major fields. They can use their knowledge, gained through the classroom as a community of practice, throughout their lives. Through their education, they will know how to research databases and sources, synthesize information, invent and develop ideas, and write cited essays, which will all contribute to the types of writing that they will have to master in their careers.

Envisioning the university classroom as a community of practice where committed participants learn the vocabulary, methodology, and methods of finding and creating knowledge through research is a laudable goal. In achieving it, the university will educate graduates who can transfer the knowledge that they have gained from their community of practice to pursuing their careers — and engaging with the world.

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Behind the Lines: A Conversation with Loretta Nyhan

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Loretta Nyhan lives in the Chicago suburbs with her husband and two teenaged sons. Her next novel, *All the Good Parts*, will be available this September through Lake Union Publishing.

Loretta Nyhan always dreamed of teaching, and after years of working as a trade journalist, she made her dream come true. She earned a graduate degree, and for the last 18 years, she's been teaching English and Humanities at DeVry. Becoming a novelist was another dream, but like the first one, this also took a little time to come true:

Nyhan: *(I) only started writing fiction after my youngest went off to school, about ten years ago. I was terrified – what if no one liked what I wrote? – but then I quickly got over my fears when I thought about how awful it would feel to NOT write.*

JM: How did you come to meet Suzanne Hayes, your co-author for this project?

Nyhan: *We met online, through mutual friends' blogs. We became critique partners, then friends, then, when both of us were completely stressed out because we had projects on submission to publishers, we became writing partners. It began as a lark—why don't we write something for ourselves while we were biting our nails, waiting? In fact, an early title for the book was "While Waiting."*

JM: The ultimate title, *I'll Be Seeing You*, is about two women who are left on their own while their sons and husbands are off at war. They meet and converse only by letter. Who came up with the idea of an epistolary novel?

Nyhan: *Suzy came up with the basic concept and sent me the first letter, basically the same one that is in the printed book. I responded immediately. The plotting came later, when we realized we needed to agree on basic plot points. We hashed those out together, over the phone.*

JM: Did you have to pitch the idea to many publishers?

Nyhan: *Our agents submitted the work to publishers, and we had interest right away. It officially sold two weeks after going on submission to publishers. In the publishing world, this is very quick!*

JM: You're the voice of Rita; she's 40-something and the daughter of German Immigrants. She grows up in Chicago and marries Sal Vincenzo. Rita and Sal's rough and tumble life seems at odds with the Waspish, somewhat indulgent, life of Gloria Astor Whitehall. How did you think the two characters would sync?

Nyhan: *I do realize it sounds a little woo-woo, but when Suzy sent me that first letter; in Glory's voice, Rita showed up, fully formed. Sometimes, when a writer is really, really lucky, that happens. When I was responding, it was almost as if Rita was nudging my shoulder, saying, "Don't write that; write this, hon."*

JM: It seems as if you and your co-author inhabited the characters you created. Was there a reason one of them had to be involved in a lover's triangle?

Nyhan: *That is probably a question for Suzy! She wrote the love triangle. I responded. That was part of the beauty of this book—when the letters were coming, we often had no idea what they contained. It helped us respond in a natural, organic manner. I knew what Rita would think, and she definitely spoke her mind!*

JM: People who study World War 2 tend to think about the people who served in uniform (men and women), and people who worked in the war plants. Not much is said about the ones who didn't go to war or to work. Why did you want to take a study of the war in this direction?

Nyhan: *We could relate to these women. Both Suzy and I have children. Like any book, this one started as a What If? What if we were faced with our sons and daughters fighting overseas, in an age when information was not instant? We also quickly realized that this was a story seldom told. Sacrifices were made by people at every level of society.*

JM: The chemistry between you and your co-author seems evident. This was a long distance effort, though, and that had to have had its own set of challenges. Were there any creative differences during the writing process?

Nyhan: O*h, we definitely had our disagreements. We did have one rule—if we disagreed about the direction the story was taking, we hashed it out on the phone until we had a compromise. It was our version of "don't go to bed angry." The work was collaborative, but we were each in charge of our own "worlds"—Suzy had the folks of Rockport, MA, and I had my little group in Iowa City. This delineation made the writing easier.*

JM: Talk about the research you conducted for this book. Getting the recipes was one thing, but being able to talk with authority about ration booklets, points, scrap drives, Victory Gardens and bacon grease suggests research on a much deeper level.

Nyhan: *We are amateur historians! I'm lucky enough to have a wonderful antique mall in my neighborhood, and I was able to see so many items my character would have used to get through her day. We also read actual letters from the era, and I spoke with a historian in Iowa City to get the details right. I have countless women's magazines from the early to mid-40s, and they told me so much about all aspects of life during wartime.*

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Between the Lines

Hayes, S., & Nyhan, L. (2013). *I'll be seeing you.* Ontario, Canada: Harlequin. ISBN: 978-0-7783-1495-0. 313 pp. $15.95.

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Around sixteen million American men and women served in World War II. Fifty to sixty million Americans did war-related work. But what of the millions of other Americans, especially women, who were too young, too old, or otherwise unable to be a "GI Joe" or a "Rosie the Riveter"? The answer offered by Loretta Nyhan and Suzanne Hayes in *I'll Be Seeing You* is four-fold: they wrote, they cooked, they gardened, and above all, they waited.

Rita Vincenzo, the daughter of German immigrants, finds herself transplanted from Chicago to Iowa City, where her husband Sal taught biology at the university before going off to war. Their only child, Toby, leaves for the Navy shortly after that. Rita doesn't know Sal or Toby's exact location as their infrequent V-Mails are censored. Rita waits for news while tending her Victory Garden. Glory Whitehall of Rockport, Massachusetts draws Rita's name at a ladies' 4-H meeting and sends an introductory letter, explaining her action is the result of feeling "lonesome (which I do) or desperate (which I didn't…but I feel it creeping in on me day by day" (p. 9). This begins a several year exchange of letters between the two fictional women whose public and private lives represent so many real women's experiences during this time.

To say Rita and Glory are different people would be like saying traditional cake and war cake are not the same. (The recipe for the latter is found in the book: no eggs, butter, sugar or milk required.) Rita is older. Glory is a young mother raising a family on her own. Rita has survived the ups and downs of life, while Glory has been pampered by a family which has known only wealth and comfort. They have in common that neither is completely whole. As all wars seem to do, this war has separated those left behind from the lives and the people they love. While they wait for the void to be filled, Rita and Glory garden, they write, and they grow, together.

Nyhan (a DeVry University English professor), and her co-author, Suzanne Hayes, work history lessons into their epistolary form. Readers unaware of wartime delicacies such as beer bread, mock apple pie, carrot fudge or tomato soup cake, not to mention ration booklets, Civil Defense Wardens and other examples of a nation engaged in total war, may realize how comparatively non-intrusive post-1945 conflicts have been. Nonetheless, the novel reminds that wars wear on everyone and provides multiple examples of the human failings brought about by this war. Rita and Glory's struggles, and their triumphs and tragedies, are displayed through their letters, both sent and not sent, and those received—"The Army Department deeply regrets to inform…" (p. 166)—which in peacetime would have never been written. The letters also suggest a seismic shift in American society as the war opens doors, not just for Rita and Glory, but for women in general.

Ordinarily, a novel promoted as "A nostalgic 1940s story told in letters between two unforgettable women," and issued under the Harlequin imprint, might be dismissed as material aimed at a specific demographic and written to entertain rather than inform. This is not the case here. Although *I'll Be Seeing You* does require readers to sometimes peer between the lines to better understand what home-front life was like during World War II, the authors clearly intend to remind us that in time of war, not wearing a uniform does not prevent becoming a casualty.

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Getting the Job

Kelsky, K. (2015). *The professor is in: The essential guide to turning your Ph.D. into a job.* New York, NY: Three Rivers Press. ISBN: 978-0-553-41942-9. 438 pp. $15.

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The Professor Is In by Karen Kelsky is a must-read for any budding academic. Although extremely useful for newly minted Ph.Ds, adjunct professors, and even prospective post doctorates, the target audience for this book is anyone who dreams of making a career in academia. Although a lot has been written for undergraduates about the job market, this book highlights the unique situation faced by Ph.D. students. Kelsky is driven by a sense of mission: she seeks to help students think ahead so they don't end up with a doctorate, a big debt, and no tenure-track job. Using case studies, she demonstrates how a Ph.D. in rhetoric and composition could pile up a debt as high as $140,000, and how a Ph.D. in psychology could run up a tab as large as $275,000. It all begins, she argues, when graduates resort to being teaching assistants or adjuncts to make ends meet, and a decade later find themselves stuck without their terminal degree and muttering to themselves, "I wish I had never gone back to school" (p. 374).

Written by someone who's been there, Kelsky offers a book that is full of advice for tenure-seeking job applicants so they can distinguish their application and portfolio from the competition. Kelsky is a veteran of the academic wars; her Ph.D. from the University of Hawai'i landed her tenured teaching posts at Oregon and Illinois. In 2010, she decided to help others learn what she found out the hard way by creating a how-to blog and becoming a regular contributor to *The Chronicle of Higher Education.*

She discusses why and how universities and those who work there have changed, primarily because of low funding and increased competition. In the light of the changed scenario, new and aspiring doctorates need the straight talk that Kelsky offers on how to play smart and navigate the system. In an environment where departments have learned to get work done through TAs and adjuncts instead of full-timers, Kelsky argues it is necessary to have a plan in order to survive the cutthroat competition as well as the politics within university departments.

Even as she demystifies the academic job market and the university atmosphere, Kelsky offers positive and workable suggestions with the goal of helping her readers land their dream jobs. She feels it is necessary to offer sobering but honest advice to idealistic researchers since they need to know "the nuts and bolts of a competitive record" (p. 92), so as to "get their head in the game" (p. 30). In what she describes as dark times in the academy, she offers details about why Ph.D. advisors do not think it is necessary to help their candidates with their careers, despite helping them through their doctorate research. She clarifies that a "good advisor is not nice" (p. 367), and discusses ethical advising in relation to doctoral students, as well as the pros and cons of post-doctoral fellowships.

Particularly helpful is the "fool proof grant proposal" template that Kelsky offers and the entrepreneurial advice she presents to those who dare to dream of putting their Ph.D. to work outside academia (p. 337). Also useful is her discussion and list of the hundred-plus skills that a researcher often learns that could translate to jobs outside the academy. If there is a fault in the writing, it is that Kelsky uses negative language and makes some sweeping generalizations. Her tone can move between

the cynical and the humorous, as it does here in a quasi-biblical send up of the qualities found in the best graduate advisors:

> Who can find a virtuous advisor? For his price is far above rubies. He seeketh publishing opportunities for her; he bringeth her funding from afar; he girdeth his loins with timely career advice; he perceiveth that his advisee is highly qualified; his candle goeth out not by night when writing recommendation letters; his advisees call him blessed. (p. 162)

However, the tone might be excusable, given the author's intention to use the book as a wake-up call to Ph.Ds hopeful of acquiring a tenure track job in what she correctly describes as "a market minefield" (p. 260). New and aspiring doctorates should read *The Professor Is In* soon so they can come up with a short-term and a long-term plan and be spared the inevitable frustrations that graduate students face when they attempt to convert their Ph.Ds into jobs.

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Fully Wired

Horowitz, P., & Hill, W. (2015). *The art of electronics* (3rd ed.). New York, NY: Cambridge University Press. ISBN: 978-0-521-80926-9. 1219 pp. $120.

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Electronics professors in search of a book to cover the vast field they teach will welcome the arrival of the latest edition of *The Art of Electronics*. This long awaited third edition updates the second effort published in 1989, and the inaugural offering, which arrived in 1980. As the authors explained, the first edition was "intended as an electronic circuit design textbook and reference book" (p. xxv), and was based on an electronics class taught by Dr. Horowitz at Harvard University. His co-author, Winfield Hill, has designed over 500 scientific instruments, and is director of the Rowland Institute for Science's Electronics Lab. In the preface to the third edition, the authors write: "... we have responded, also, to the reality that previous editions have been enthusiastically embraced by the community of practicing circuit designers" (page xxix). Although it has been used as a textbook, many designers continue to use it as a reference outside the classroom. The authors do a great job of presenting the material. The informative, yet humorous, way content is presented clearly suggests they enjoy their work.

Clarity and continuity are just two of the distinguishing features of the series. All editions start with a chapter on the foundation of electronics, which introduces the common components and explains their function. Analog circuits are introduced next, starting with transistors and working up to operational amplifiers, filters, oscillators, and timers. The digital chapters cover the different types of logic devices and how they can be interfaced to other digital devices and with the analog world. The third edition offers new features to reflect changes in the field. "Designs by the Masters" are illustrations that look at commercially available products and explain how the design goals were achieved. Since more electronic designs now incorporate embedded microcontrollers, the authors have expanded the sections on analog-to-digital, digital conversions, peripheral chips and interfaces used by microcontrollers, plus precision analog design to achieve required accuracy. What has not changed is the writers' extensive design experience that they humbly share in each section. Over 1,500 figures and 80 tables provide excellent support for the text. The authors have tested many electronic components, and display the results in easy to read tables. It can take hours to research devices on the manufacturer's websites; so these tables are extremely useful for device selection.

The term art implies creative choice, and not just following rules. Horowitz and Hill illustrate the art of circuit design by stressing the choices needed to be made, and what separates a design that works from a design that works well. A design challenge that appears throughout the book is the "Integrating suntan monitor." As the authors explain, "We nerds don't ordinarily go to the beach. But when we do, we like to rely on some electronics to tell us when to turn over" (p. 78). The first design utilizes an operational amplifier (op-amp), and achieves the design goal. The design is completely analyzed, and even the battery life is estimated. Not content with the first design, the authors also present and analyze two improved op-amp designs. The same problem is also attacked in the mixed-signal (analog + digital) chapter, utilizing a delta-sigma digital integrator, and finally in the microcontroller section. A resource section provides helpful sources for electronic equipment for professional and hobby use, as well as references for further study.

Although an index is provided, a possible improvement for future editions might include a CD ROM with a searchable version of the book. The book also has very little information on printed circuit board layout and design, although some information is interspersed in the appendix on transmission lines, the low-noise techniques chapter, and some of the circuit design examples. Because proper layout is necessary to achieve the rated performance of many high accuracy components, this is a large omission. Of course, also given the rapid changes in electronics, a more timely arrival of updated editions of the work would be appreciated.

Shortcomings aside, *The Art of Electronics* strikes a great balance between presenting understandable explanations for those new to the field, and effectively covering the advanced material that can trip up even the most experienced designers. Since the first edition, the Internet has changed how circuit designers access information, so some may question the need to buy the book. *The Art of Electronics* demonstrates the value of an authoritative guide that organizes information in an easy to access format. Users who valued the second edition will equally prize the latest effort.

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Inevitable Consequences

Hayes, J. (2013). *Consequential damages.* Author. ISBN: 978-0-615-81971-6. 392pp. $14.95.

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In *Consequential Damages*, Joseph Hayes takes readers through plot lines that involve accomplishment, fraud, deceit, love, murder, and redemption. Written as a work of fiction, it depicts what can happen in high stakes civil litigation.

The story opens in a Chicago cemetery on a cold, November day. The central character, attorney Jake McShane, is clearly distraught as he walks among the headstones. He's worried about a pending trial that will impact the rest of his life. A man in a white Cadillac seems to be watching his every move—a man he recognizes but cannot place in his memory. And so the story begins.

Hayes tells Jake's story in flashback mode. He's just arrived at Stanford Law School, where he meets fellow Chicagoan Richard Black, who was starting point guard for Indiana in the most recent NCAA championship game. Basketball will end up being an important subplot in this story. Jake has his own basketball skills, and he and Rick often participate in pick-up games on and off campus as a way to blow off steam from their studies.

The semester flies by and finals week approaches. Law students feverishly create outlines of all the material covered in each course. Jake spends hours in the library working on his outlines. He takes a much needed break and leaves his belongings there, unattended. He returns to find that all of his work has vanished. How can he possibly recreate these outlines that took him days to prepare? He returns to his dorm, totally dejected and hopeless. He goes to the stairwell to be alone and decompress. A young woman coming down the stairs stops and introduces herself. She's Amanda Chang, a medical student. Jake is instantly intrigued.

The following day Jake, Rick, and a few other law students take a break from their studies and drive down the California coast. Rick picks them up in his black BMW, and intimates that his lifestyle is subsidized by his rich lawyer father. As the classmates discuss the possibility that one of their finals may be a take home, Rick begins to show his true character. He explains that his plan is to graduate at the top of his class and that a take home exam is a perfect way, given that he would have all the necessary resources at his fingertips. The others remind him it is not an open book exam and they have signed an Honor Code. Rick notes the loophole: "there's no way to enforce that requirement; everyone else will be ignoring it; there's no risk of getting caught. So, why not? You guys could really benefit from a dose of the real world" (p. 26). It's an early and unheeded warning to Jake about Rick's ethical lapses.

Jake survives finals and heads to a party with friends, where he again sees Amanda. They spend the party and most of the night talking and walking around campus. They make a date for the evening before Jake returns to Chicago for the holidays. That afternoon, Jake is in the dorm lounge when Rick tries to talk him into shooting some hoops. Jake declines, so Rick asks to use his ball and goes to Jake's room to retrieve it. While there, he hears Jake's answering machine kick in. It's Amanda, calling to break their date due to a family emergency. Rick erases the message, leaving Jake in the lurch when Amanda's a no-show. Rick later compounds the offense by floating a rumor that Jake has a fiancé in Chicago.

Once Jake learns of the misunderstanding with Amanda, and that Rick told friends he was engaged, he immediately sets the record straight. His romance with

Amanda blossoms and during the Christmas holidays of his last year at Stanford, Jake proposes. They marry the following summer.

After graduation, Rick returns to Chicago to work with his father, while Jake starts out as an associate at a Chicago civil litigation firm. He and Amanda spend weekends enjoying everything that Chicago has to offer. They have a daughter named Anna. Jake works hard at creating balance in his life, trying to be home for dinner, even if it means returning to the office to work until late at night. Eventually, he's recruited by one of Chicago's top litigation firms. Amanda opens a medical clinic. It's a picture of a happy and fulfilled life for Jake and his family.

Rick is busy building a practice and a reputation of his own. Jake is stunned to read about a lawsuit filed against a grocer from his old neighborhood. The man is beloved in the community and Jake cannot believe the allegations that an employee was fired for rebuffing the grocer's sexual advances. Jake attends the trial and watches Rick demonstrate his skills on the jury, who finds against his friend. Something about Rick bothers him, but he isn't able to really understand it.

After his well-publicized victory over the grocer, Rick is courted by major Chicago law firms and is hired by one as a top litigator. Even though he has done well, he's still waiting for that big case to seal his reputation as the city's top lawyer. And it has just come his way. He's been named as the plaintiff's attorney in a class action suit against one of the largest clients in Jake's firm. When Jake is assigned to the case, the reader knows this will be the ultimate showdown between these two ambitious attorneys. Trying the case proves to be dangerous for Jake, and there's an incident which changes his and Anna's lives forever, leaving him disillusioned about life and the law. But he must put his tragedies behind him if he hopes to match wits with Rick, his former friend, now his most formidable foe.

Although *Consequential Damages* may not be the type of novel which leaves all readers in a state of angst every time they put down the book, Joseph Hayes still manages to provide plenty of twists and turns to keep the reader engaged. His writing style may remind some of the early efforts of John Grisham and Scott Turow, who also have established, successful dual careers as lawyers and novelists. As a practicing attorney himself, Hayes understands the complexities of civil litigation and is able explain the jargon and procedure without leaving one feeling intimidated. Occasionally, plot points are resolved in a fairly predictable manner, but the reader will nonetheless come away satisfied with that resolution. Hayes exposes what could be the seamier side of the law, where plaintiffs' attorneys are poised to become wealthy with just one case. But there's a happy ending here, one which includes a reassurance that most attorneys do the right thing, and that the justice system is in good hands.

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CALL FOR PAPERS, DECEMBER 2016 ISSUE

The *DeVry University Journal of Scholarly Research* (DUJOSR) continues to expand its pages to include a variety of publishing opportunities for faculty. Academic scholarship remains a staple for the journal, but new categories include Case Studies, Book Reviews, Letters to the Editor, and a "From the Classroom" section, in which faculty can share vital experiences and best practices. These categories of submission are fully described below. Specific deadlines and instructions for submission conclude this "Call for Papers."

Academic Scholarly Articles

For the December 2016 issue, we continue to solicit "working papers" (3000 to 5000 words) in our scholarly article category.

Papers of all types are welcome including theory, empirical, or methodology papers, as well as literature reviews, from both positivist and naturalistic traditions. Research- and evidence-based papers emphasizing practical relevance that resonate with our readers are preferred. We regard submissions as "working papers" that can be submitted to other journals for consideration (but have not been previously published elsewhere).

The review process requires that each paper is coded and blind reviewed by two peer reviewers with expertise in the author's discipline. Faculty volunteers (for whom profound gratitude is expressed) comprise the peer review board. Final publication decisions are made by the editorial board, consisting of College and Managing Editors.

Authors who have previously submitted academic scholarly papers for past issues are encouraged to re-submit their revised papers. Papers should be sent with an additional document that specifies detailed responses to reviewers' and editors' feedback.

Case Studies

DUJOSR solicits case studies (ranging from approximately 500-word short cases, to 1000 to 3000-word long cases) that have not been published elsewhere, but are considered "working papers." The purpose of this initiative is to create a repository of case studies that can be used by faculty to teach Keller MBA courses. Our aim is to provide Keller students with a unique and valuable learning experience that has been generated by our faculty.

Case studies of all types are welcome, including multi-media. We would prefer case studies that emphasize practical relevance that resonate with our faculty and students. Case study submissions must also be supported by a set of directions, i.e., Faculty Teaching Notes. The teaching notes must indicate the relevant courses and TCOs associated with the case study, as well as suggested question strategies and pedagogical practices.

The case study should be

- significant,
- complete,
- compelling,
- inclusive of alternative perspectives,
- qualitative,
- sufficiently evidenced,
- aligned with one or more Keller Course Objectives, and
- written with accuracy and relevance.

The review process for case studies is the same as for academic scholarly papers. Case studies will be evaluated on the following criteria:

1. Timeliness of case & relevancy (tied to 1 or more Keller Course Objectives),
2. Theoretical framework,
3. Case development (including discussions if applicable),
4. Case notes for faculty,
5. Study results,
6. Opportunity to expand knowledge,
7. Implications to field of studies,
8. Writing quality: Clarity, conciseness, and organization,
9. Writing quality: Grammar and Mechanics, and
10. APA format, including citations and reference page.

There is no submission deadline; case studies will be accepted on an ongoing basis.

Book Reviews

Book reviews continue to be a regular feature in the journal pages. They are an important part of scholarly life. They alert colleagues to new developments in the academy, foster discussions that can lead to new scholarship, and ultimately provide us with both a broader and deeper view of the world, which we in turn can share with our students.

Reviews of either fiction or non-fiction works should adhere to the following publication guidelines:

1. Reviews should be between 500 to 1000 words in length, double spaced, and include the following: author, title, place of publication, publisher, year, price, page length (including introduction and text), and International Standard Book Number (ISBN).
2. Reviews should include a brief summary of the scope, purpose, content of the work, and its significance in the literature of the subject. Reviews should evaluate the strengths and weaknesses of the work as well as attend to its use of sources, including documentation, methodology, organization, and presentation.
3. Reviews should be fair, balanced, and treat authors with respect.
4. A signed permission form to publish a review is required.

Letters to the Editor

Letters to the Editor are a welcome addition to the journal pages. Letters that reply to or extend academic scholarship published within DUJOSR pages are particularly welcome, as these add rich texture and dialogue to ideas presented. Letters should be professional, well-tempered, and engage with content meaningfully. Letters that do not necessarily attend to previously published work, but are timely and relevant are also welcome.

Letters responding to published articles in DUJOSR should identify the month and year of the article, review, or previous letter on which it is commenting. The full title of the article, review, or letter as well as the author(s) name(s) should be included. Letters should be double-spaced and 500 to 1000 words in length. Letters may express well-tempered opinions, but should include citations in cases where academic integrity requires documentation. Letters should be fair, balanced, and treat authors with respect.

From the Classroom

This section of the journal is newly offered to faculty who have rich pedagogical experiences worthy of sharing with a larger audience. Papers in this category may use research to support ideas, but may also consist of valuable experiences about which research may not have yet caught up. Well-crafted papers that demonstrate increased student engagement in the classroom are particularly prized. In this category, the recommendations for length are 750 to 1000 words, but longer papers of exceptional quality and relevance will be considered. Content should seek to express pedagogies that transcend the commonplace or that provide an interesting new spin on well-trod best practices.

Editors' Instructions for Submission and Deadlines

All submissions are expected to follow the APA style sheet. Templates and APA source materials are available through the DeVry Commons intranet community site, *DeVry University Journal of Scholarly Research*, under the following headings:

- Guide to APA Research Writing and Formatting Template Revised Nov 2013
- Guide to APA Research Writing and Formatting Revised Nov 2013
- DeVry University APA Handbook
- APA 6th Guide to Citing Sources

The submission deadline is August 29, 2016. Please submit work in any category to Managing Editors, Sarah Nielsen and Deborah Helman, at DUJOSR@devry.edu

The Managing Editors reserve the right to edit all submissions in any category of submission for length, tone, and content, over and above recommendations made by peer reviewers and College Editors.

CHAMADA DE ARTIGOS

O *DeVry University Journal of Scholarly Research (DUJOSR)* continua expandindo suas páginas para incluir dentro de si uma ampla variedade de oportunidades de publicação para acadêmicos. A produção acadêmica continua sendo o ponto central deste periódico, mas dentre suas novas categorias incluem-se agora estudos de caso, resenhas de livros, cartas ao editor e a seção "da sala de aula", onde professores poderão compartilhar experiências e boas práticas. Estes tipos de ensaio encontram-se descritos de forma completa mais adiante. Prazos e instruções específicas para submissão concluem esta chamada de artigos.

Artigos Científicos

Para a edição de Dezembro de 2016 deste *journal*, nos continuamos a solicitar artigos científicos (3000 a 5000 palavras) que ainda não foram publicados em outros periódicos e que constituam "trabalhos em andamento".

Trabalhos de qualquer tipo são benvindos, incluindo trabalhos teóricos, empíricos ou estudos de caso, papeis de metodologia, revisões de literatura e demais, tanto de tradições positivistas quanto naturalistas. Nós preferiremos trabalhos que sejam relevantes a prática de nossos leitores, não deixando de lado o fato de que devem ser baseados em pesquisas. Também entendam que estas submissões serão consideradas como "pesquisas em andamento" o que não impede sua publicação futura em outros periódicos (mas que ainda não foram publicadas em outros periódicos).

Cada submissão será codificada antes de ser enviada para a revisão. As submissões passaram pelo método de revisão às cegas *(double blind review)* por dois colegas revisores (agradeço a todos os professores que se voluntariaram para esta tarefa emprestando seus conhecimentos). A seleção final dos artigos será feita pelo conselho editorial, que consiste nos editores de centro e os editores administradores.

Encorajamos os autores que submeteram trabalhos para edições anteriores a re-submeter seus trabalhos. Estes trabalhos devem ser enviados com um documento adicional com os comentários que demonstrem como de recebeu o feedback de seus revisores e editores.

Estudos de caso

O *DUJOSR* busca estudos de caso (que vão de estudos curtos com aproximadamente 500 palavras a estudos mais longos, com 1000 a 3000 palavras), que ainda não foram publicados em outros locais, mas ainda são considerados trabalhos em andamento. O motive desta iniciativa é criar um repositório de casos para que os mesmos possam ser utilizados pelos discentes que ensinam os cursos de MBA da Keller. Nosso objetivo é prover os alunos da Keller com uma experiência única e valiosa de ensino gerada pelo nosso corpo discente.

Estudos de caso de todos os tipos são bem-vindos, incluindo estudos em multimídia. Nós preferimos estudos de caso que enfatizam conceitos práticos e que ressoem em nosso corpo discente e docente. As submissões de Estudo de caso devem ser apoiadas por uma série de diretivas, descritas em Anotações de Apoio ao Ensino *(Faculty Teaching Notes)*. As anotações devem indicar os cursos e objetivos específicos dos mesmos com o Estudo de caso, bem como sugestões de questionamentos e estratégias e de práticas pedagógicas.

O estudo de caso deve ser:

- Significante;
- Completo;
- Atraente;
- Com múltiplas perspectivas;
- Qualitativo;
- Com evidências comprobatórias;
- Alinhado com um ou mais objetivos dos cursos Keller; e
- Escrito com precisão e relevâncias.

O processo de revisão de estudos de caso é o mesmo que para trabalhos acadêmicos. Os estudos de caso serão avaliados segundo os critérios abaixo:

1. Contemporaneidade do caso e relevância (amarrado a 1 ou mais Objetivos Keller claro),
2. Referencial teórico,
3. Desenvolvimento do caso (incluindo discussões, se aplicável),
4. Anotações do Caso para professores,
5. Os resultados do estudo,
6. Oportunidade de expandir o conhecimento,
7. Implicações para campo de estudos,
8. Escrita de qualidade: clareza, concisão, e organização,
9. Escrita de qualidade: Gramática e Mecânica, e
10. Formato APA, incluindo citações e página de referência.

Não há prazo de submissão; estudos de caso serão aceitos em fluxo contínuo.

Resenhas de Livros

Resenhas de livros continuam a ter presença regular nas páginas do *journal*. Elas são uma parte importante da vida acadêmica. Elas alertam os colegas para novos desenvolvimentos na academia, alimentam discussões que podem levar a novas pesquisas, e, finalmente, nos fornecer tanto uma visão mais ampla e mais profunda do mundo, que por sua vez podemos compartilhar com nossos alunos.

As resenhas de obras de ficção ou não-ficção devem atender as seguintes diretrizes:

1. As resenhas devem ter entre 500 e 1000 palavras, espaçamento duplo e incluir: nome do autor, título, local de publicação, editora, ano, preço, número de páginas e o *International Standard Book Number* (ISBN).
2. As resenhas devem incluir um rápido resumo do escopo, proposta, conteúdo do trabalho e seu significado na revisão da literatura da temática. Elas devem avaliar os pontos positivos e negativos do trabalho e ter atenção para o uso de referências (incluindo documentações), metodologia, organização e apresentação da obra.
3. As revisões devem ser justas, balanceadas e tratar os autores com respeito.
4. A apresentação de uma permissão por escrito para publicar a resenha é obrigatória.

Da sala de aula

Esta seção da revista é recém oferecida aos professores que tem experiências pedagógicas ricas e dignas de serem compartilhadas com um público maior. Ensaios nesta categoria podem usar pesquisas para apoiar suas ideias, mas pode também consistir de experiências valiosas sobre o que a pesquisa pode ainda não ter consolidado. Ensaios bem trabalhados que demonstrem maior envolvimento dos alunos em sala de aula são particularmente apreciados. Nesta categoria, as recomendações para o comprimento é de 750 a 1000 palavras, mas ensaios de maior qualidade e de relevância excepcional serão considerados. O conteúdo deve procurar expressar pedagogias que transcendem o lugar comum ou que forneçam uma nova rodada interessante sobre práticas bem trilhadas.

As instruções do editor de apresentação e Prazos

Todas as submissões devem seguir o estilo *APA*. Modelos e materiais de base da *APA* estão disponíveis através do link de pesquisa disponível no portal Academus , sob os seguintes títulos:

- Guide to APA Research Writing and Formatting Template Revised Nov 2013
- Guide to APA Research Writing and Formatting Revised Nov 2013
- DeVry University APA Handbook
- APA 6th Guide to Citing Sources

O prazo para envio é 29 de agosto de 2016. Por favor envie o trabalho em qualquer categoria para as de Editoras executivas Sarah Nielsen e Deborah Helman, no DUJOSR@devry.edu

As editoras executivas reservam-se o direito de editar todos os arquivos submetidos em qualquer categoria de comprimento, tom e conteúdo, para além recomendações feitas pelos revisores e editores universitários.

NOTES:

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For comprehensive consumer information, visit devry.edu/studentconsumerinfo

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