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A TEACHING TOOL FOR COMPUTING STOCK RETURNS, RISK AND BETA

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ABSTRACT

The purpose of this paper is to serve as a guide for students' use of actual data for risk and return calculations. The study of stock return risk has been of interest to investors and academics for several decades. Early discussion of the "mean-variance framework" described the rationale for requiring additional expected income as a reward for choosing higher risk investments. The general concept is to evaluate return risk either on a stand-alone basis (commonly using standard deviation or variance) or on a relative basis (calculating a beta value using a market index or calculating multiple securities portfolio risk). This paper presents a description of the procedure for calculating stand-alone risk and the Capital Asset Pricing Model Beta value using stock prices and the SP500 market index. In addition, the risk (beta) stability over time is addressed.

JEL: C81; C87

KEY WORDS: Stock Returns; Risk; Capital Asset Pricing Model; Financial Modeling

INTRODUCTION

This paper improves the pedagogy for applying stock return analysis to information from online financial sites. Investors have long recognized that there is a valid reason to make portfolio choices based on an individual's risk tolerance and an adequate understanding of the potential for loss or gain of various investments. Risk is classified as systematic or non-systematic; purchasing power; default or liquidity, among others. Measures of stock price (return) risk are of interest to investors.

The approach discussed here should be useful for students of financial management who could benefit by having the opportunity to apply theoretical textbook illustrations to real world situations. Student may develop enthusiasm about analysis of financial information when they are able to replicate professional analysis.

Financial Management textbooks present risk in a variety of ways. Block, Hirt and Danielson (2009) discuss returns risk through a Capital Asset Pricing Model (CAPM) Beta calculation illustration. This presents (Stock and market) annual returns and a graph showing a plot of these data pairs. Discussion of the Security Market Line shows a beta value, the risk free return and market return proxies. Applications of beta to forecasting returns and risk adjustments for Capital Budgeting follow. Parrino and Kidwell (2009) devote a chapter to Quantitative Measures of Return. Returns calculation is illustrated, along with a thorough discussion of standard deviation and variance. Single asset risk is described in the context of possible economic outcomes and the associated probabilities, providing the opportunity to calculate standard deviation and the coefficient of variation. In addition, the concept for calculation of risk for a multiple asset portfolio is discussed. Systematic risk is presented with a five-year plot of General Electric stock returns and the SP500 Index. Brigham and Houston (2007) provides examples of reasons that there might be shifts in the Security Market Line, and discusses beta and matters pertaining to beta changes over time. A spreadsheet problem at the end of the chapter asks students to calculate a beta value using six annual return values for two stocks and an appropriate industry index. There are a number of illustrations of beta values, the risk free rate, and estimated market returns used for stock returns forecasting.

Among the Financial Modeling textbooks, the risk calculation instruction is more developed. Benniga (2006) and Benniga (2008) present improved beta calculation discussions. He presents an approach for downloading stock return and index data from Yahoo Finance. The method is consistent with the risk and return calculation technique discussed in this paper.

This paper seeks to improve the pedagogy for investment mean-variance instruction. This establishes the association between a professionally prepared beta value, found online (in Yahoo Finance) and the beta value from the instructions presented here. This serves to improve the student's confidence in stock analysis when they practice the technique using real data. This establishes a connection between classroom "theory" and information provided by the experts.

The remainder of the paper's organization is this: A review of related journal literature discusses advances in internet financial data retrieval, followed by a discussion of data sources for financial analysis and the associated EXCEL techniques for risk measures and beta calculation. The remaining section contains a summary of the motivation, presentation and applications.

LITERATURE REVIEW

There are several pedagogical benefits from the use of spreadsheets and internet data for financial modeling. Students can become more engaged in the theoretical and empirical concepts when they are able to download data and use a spreadsheet to replicate the results provided by professional analysts. In recent years, there have been several presentations of these techniques. Following are reviews of several recent articles, which describe innovations in the internet retrieval and financial data processing.

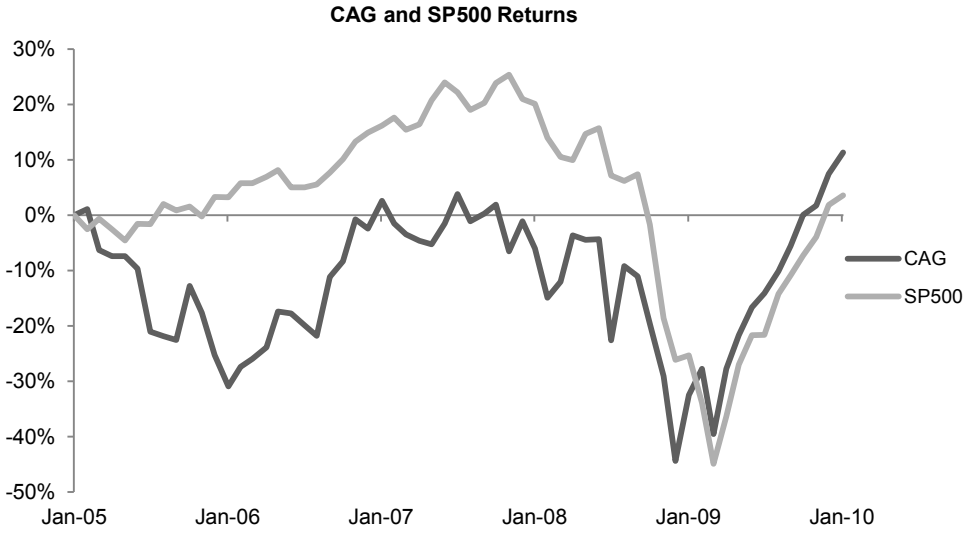
Holtzman and Kraft (2010) make a justification for student proficiency in the areas of quantitative analysis and computer skills. Employer and alumni survey results indicated that the most desired quantitative skills are in the areas of financial and accounting analysis and forecasting. Furthermore, following only the use of EMAIL, the most valued computer software proficiency is spreadsheet use.
Biktimirov and Nilson (2007) describe some procedures that are appropriate for an introductory finance class. In particular, instruction in portfolio expected return, risk, and diversification are enhanced using an online interactive course design.

MacDougall and Follows (2006) present the use of EXCEL spreadsheet templates as a way to enhance the model building skills of corporate finance students. Mukherji (2003) illustrates the use of EXCEL and computer based data sources for the construction of a common stock analyst's report. Carter, Dare and Elliott (2002) use Internet data and EXCEL to calculate the mean, variance and portfolio efficiency.

COMPUTATION TECHNIQUES

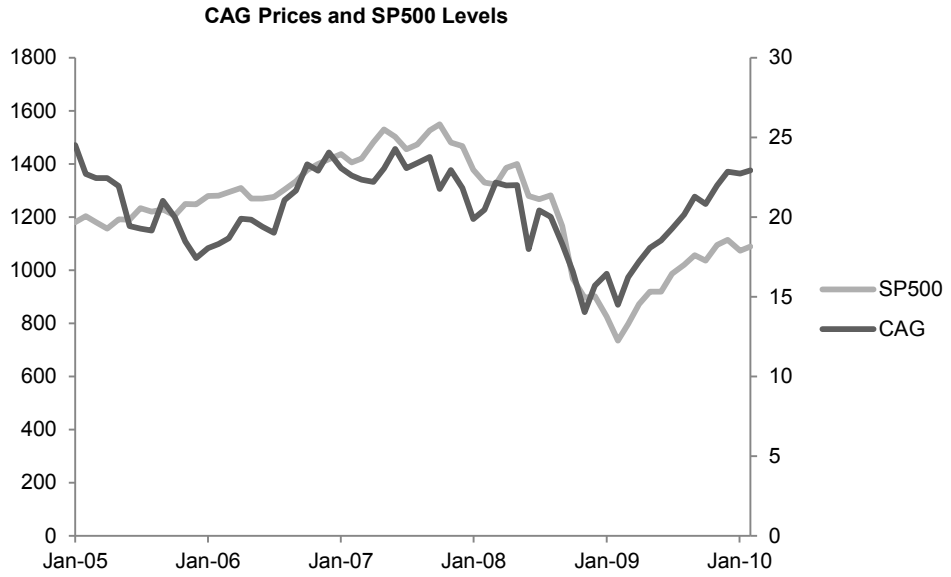
We present a method to quickly set-up and solve for mean-variance efficient portfolios in a Microsoft Excel spreadsheet using data downloaded from the Internet. As a pedagogical tool, this exercise provides several benefits. First, it stimulates student interest because of the use of 'real' data from the Internet; it builds their spreadsheet and general computer skills, and improves their understanding of financial concepts. The method can solve for mean-variance efficient portfolios equivalent to the Markowitz method but requires considerably less effort to formulate when using a spreadsheet.

Figure 1a: Stock Returns and Market Index (SP500) Changes



Conagra and SP500 Returns. This graph shows the returns profile for Conagra (CAG) and the SP500 (^GSPC) for a 5 year interval. At the beginning, each is standardized at zero; the graph shows a cumulative return. Note the degree to which the returns move synchronously.

Figure 1b: Stock Prices and a Market Index (SP500)



Conagra Prices and SP500 Levels. This graph shows the price levels profile for Conagra (CAG) and the SP500 (^GSPC) for a 5 year interval. The SP500 scale is on the left, the CAG price scale is on the right.

A graph of the simultaneous stock and market returns (Figure 1a) is useful to set the stage for understanding the relationship between these values. Shown here are five-years of returns for Conagra (CAG) and the SP500 (^GSPC). Visual inspection shows that CAG returns track the market returns fairly well, as one would expect for a company that has a beta near 1.0 (in this case, the Beta is 0.80). Figure 1b shows the CAG price and SP500 index levels for the same interval. Yahoo Finance has a similar returns graph in the CAG Basic Charts window:
finance.yahoo.com/q/bc?t=5y&s=CAG&l=on&z=l&q=l&c=&c=%5EGSPC.

Capital Asset Pricing Model (Beta): The Capital Asset Pricing Model (CAPM) Beta is a measure of relative risk, in this case risk relative to the market, represented by an index. Beta is calculated using a stock's returns and the simultaneous market return. Betas may be calculated for various return intervals, such as daily, monthly or annually and typically extend over a period of several months to many years, as appropriate for the compounding interval. There are also several indices such as the NYSE composite, the SP500 and the Wilshire 3000. Sometimes the stock and market returns are corrected using a risk-free rate "proxy", such as the US Government t-bill rate.

The Yahoo Finance Key Statistics page contains a variety of financial data, including the most recent beta value. This will permit verification that the observed and calculated beta values are identical. The link for this page is http://finance.yahoo.com/q/ks?s=CAG. Beta is obtained from Standard and Poor's Capital IQ, which uses three years of monthly returns and the SP500 market "proxy" index (Ticker: ^GSPC). The Capital IQ website is https://www.capitaliq.com/main.asp. Several other investment websites provide beta values.

Adjusted price data comes from the Yahoo CAG link: http://finance.yahoo.com/q/hp?s=CAG. The Yahoo Finance webpage presents adjusted historical prices, which are available on a daily, weekly or monthly interval. Download the data into a spreadsheet format.

Save these files using EXCEL. Merge the contents of the SP500 file worksheet and the stock prices worksheet. One method is to copy and paste the contents of one worksheet into the other. Make sure that that all dates (rows) correctly align. Retain only the columns containing dates and adjusted closing prices and delete all other columns. Chronologically sort the prices using the EXCEL sort function (ascending date sort). Calculate monthly rates of return using the equation (P1-P0)/P0. As an example, if your prices are in Column B, a suggested EXCEL formula is =(B2-B1)/B1. Use the autofill handle to replicate the formula through the other cells in the stock price returns calculation column. Repeat this process to calculate changes in the market index. Beta calculation requires one column containing monthly stock returns and another column containing the coincidental monthly SP500 change.

Details of the beta calculation concept are contained in this Yahoo Finance link:
http://help.yahoo.com/l/us/yahoo/finance/tools/fitakeystats.html.

Yahoo describes the Beta value this way: *The Beta used is Beta of Equity. Beta is the monthly price change of a particular company relative to the monthly price change of the SP500. The period for Beta is 3 years (36 months) when available.*

Table 1 shows adjusted Conagra prices and the monthly percentage change, the SP500 index and the percentage monthly change. At the bottom are the mean, standard deviation and variance for 36 months. These calculated by the appropriate EXCEL STATISTICS drop down menu. The last column is the beta, calculated for the 36 preceding months. Each beta value is based on 36 monthly stock returns and the simultaneous market returns.

The Beta value is the Ordinary Least Squares (OLS) regression slope. This is contained in several EXCEL functions, including the STATISTICS SLOPE function. Another method is the EXCEL Data Analysis Toolpack REGRESSION function. The SLOPE function ***fx*** is within the STATISTICS drop-down function menu. Select this and enter the range of values for the 36 most recent stock returns (the y-value) and index changes (the x-value). The most recent beta value calculation (SLOPE) belongs in the row that contains the most recent date, price and returns values. The calculated beta should match or be very close to the Yahoo Finance Key Statistics beta. A common mistake is a mismatch of dates between the stock and the index. Another possible difference may occur for thinly traded firms, such as some

NASDAQ securities. In the event that the calculated beta does not match the Yahoo beta, replicate the illustration in this paper.

Table 1: CONAGRA 3 Year (Monthly) BETA - SP500 Index- FEB 2010

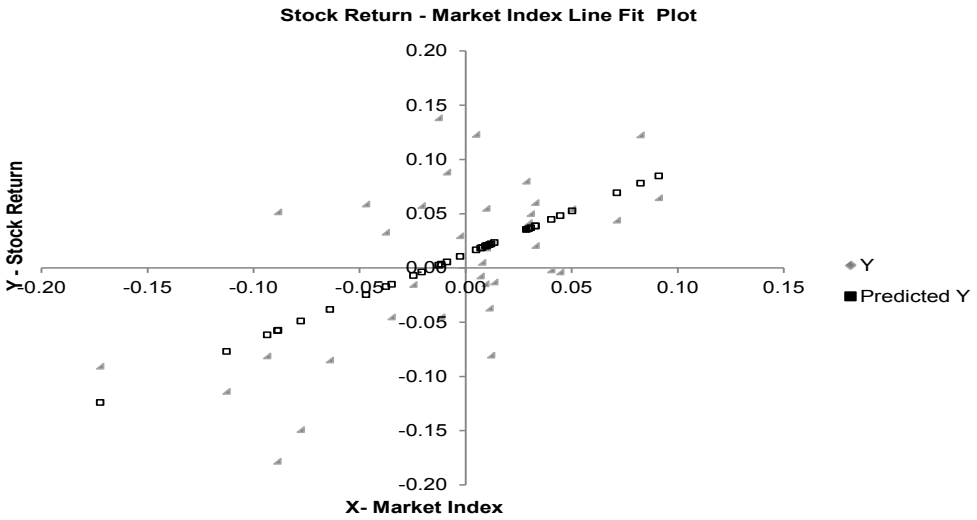
DATE	CAG $	CAG %	SP500 $	SP500%	BETA - 3 YR
03/01/07	22.35	**-1.19%**	1420.86	**1.00%**	**0.451116**
04/02/07	22.22	**-0.58%**	1482.37	**4.33%**	**0.547358**
05/01/07	23.05	**3.74%**	1530.62	**3.25%**	**0.590917**
06/01/07	24.28	**5.34%**	1503.35	**-1.78%**	**0.509207**
07/02/07	23.08	**-4.94%**	1455.27	**-3.20%**	**0.559366**
08/01/07	23.4	**1.39%**	1473.99	**1.29%**	**0.564317**
09/04/07	23.79	**1.67%**	1526.75	**3.58%**	**0.560532**
10/01/07	21.78	**-8.45%**	1549.38	**1.48%**	**0.518657**
11/01/07	22.96	**5.42%**	1481.14	**-4.40%**	**0.280245**
12/03/07	21.83	**-4.92%**	1468.36	**-0.86%**	**0.197221**
01/02/08	19.89	**-8.89%**	1378.55	**-6.12%**	**0.454279**
02/01/08	20.46	**2.87%**	1330.63	**-3.48%**	**0.42163**
03/03/08	22.18	**8.41%**	1322.7	**-0.60%**	**0.383203**
04/01/08	22	**-0.81%**	1385.59	**4.75%**	**0.34465**
05/01/08	22.02	**0.09%**	1400.38	**1.07%**	**0.37922**
06/02/08	18	**-18.26%**	1280	**-8.60%**	**0.800827**
07/01/08	20.42	**13.44%**	1267.38	**-0.99%**	**0.787163**
08/01/08	20.03	**-1.91%**	1282.83	**1.22%**	**0.775941**
09/02/08	18.33	**-8.49%**	1166.36	**-9.08%**	**0.795655**
10/01/08	16.59	**-9.49%**	968.75	**-16.94%**	**0.685973**
11/03/08	14.04	**-15.37%**	896.24	**-7.48%**	**0.850172**
12/01/08	15.71	**11.89%**	903.25	**0.78%**	**0.881524**
01/02/09	16.46	**4.77%**	825.88	**-8.57%**	**0.758996**
02/02/09	14.51	**-11.85%**	735.09	**-10.99%**	**0.808375**
03/02/09	16.24	**11.92%**	797.87	**8.54%**	**0.852685**
04/01/09	17.22	**6.03%**	872.81	**9.39%**	**0.813412**
05/01/09	18.08	**4.99%**	919.14	**5.31%**	**0.816748**
06/01/09	18.54	**2.54%**	919.32	**0.02%**	**0.82012**
07/01/09	19.28	**3.99%**	987.48	**7.41%**	**0.802703**
08/03/09	20.16	**4.56%**	1020.62	**3.36%**	**0.787113**
09/01/09	21.29	**5.61%**	1057.08	**3.57%**	**0.794199**
10/01/09	20.82	**-2.21%**	1036.19	**-1.98%**	**0.780702**
11/02/09	22	**5.67%**	1095.63	**5.74%**	**0.79116**
12/01/09	22.85	**3.86%**	1115.1	**1.78%**	**0.789554**
01/04/10	22.74	**-0.48%**	1073.87	**-3.70%**	**0.794721**
02/01/10	22.94	**0.88%**	1089.19	**1.43%**	**0.791683**
MEAN	20.32056	**0.003124**	1195.001	**-0.00541**	
STD DEV	2.749487	**0.072746**	246.8593	**0.05687**	
VAR	7.559677	**0.005292**	60939.53	**0.003234**	

Raw Prices and Calculated Returns. Table 1 presents the raw data from Yahoo Finance (Conagra (CAG) prices plus Market (SP500)) levels and the percentage changes in these 2 values. Measures of return (MEAN) and risk (ST DEV and VAR) are calculated using EXCEL statistical functions and presented in the bottom rows. The beta value, shown in the fifth column, is in each case calculated from the returns of the preceding three years of monthly returns data.

Figure 2 shows the X-Y plot of 36 market and stock returns superimposed with the EXCEL OLS regression line. The Beta value is the slope. The plot is often in textbook CAPM discussions and presented here to establish the interpretation of the relationship between the stock return and market change.

An additional dimension of risk analysis is an examination of whether the risk measures are constant over time. See Figure 3. In this case, Beta values are calculated for sequential months over an extended interval. To facilitate calculation of these, the SLOPE function for the most recent month can be easily replicated into cells that correspond to other three-year stock and index return intervals. The EXCEL autofill handle feature allows for the rapid recalculation of the SLOPE (BETA) for any 36-month data set. The resulting series of beta values can be tested for stability using scedasticity measures, which are not discussed in this paper.

Figure 2: Excel Generated Regression Plot Showing Returns and Line Fit

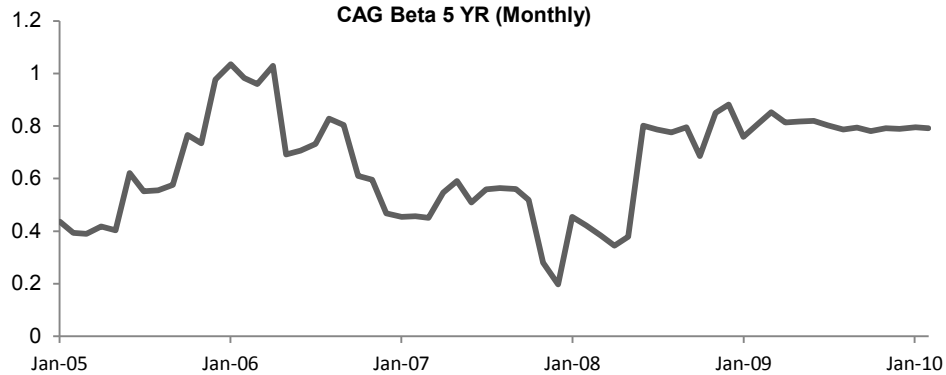


Beta Linear Model. Beta Plotting: Using the EXCEL Tools - Data Analysis - Regression feature. Identify an X value (the market return) and a Y value (the stock return). Once these are selected, progress through the remaining wizard screens. Check the LINE FIT PLOTS box . The output worksheet contains the Beta (Slope) value and a variety of other statistics related to the regression analysis.

CONCLUDING COMMENTS

The relationship between risk and return is one of the foundational tenants of Finance theory and applies to investment decisions. From its origin, analysts have calculated these measures from stock prices and market indices. In early times, data access was cumbersome and analysis tedious. The approach described here allows investors and students at all experience levels to apply these concepts to familiar sources of information and build their confidence. Data from several financial websites can be retrieved for technical analysis using common software. This paper presents specific instructions for calculation of CAPM Betas that match those of professional analysts.

Figure 3: Excel Generated Plot of Sequential Beta Values



Beta Stability. The value of any statistic for purposes of forecasting is best if there is a reasonable continuity of the statistical measure. This is a presentation of a series of betas calculated with the technique described here. Visual examination of the graph allows one to draw conclusions about the beta stability and make inferences about the suitability of the beta value for returns estimation.

Further applications of online financial data retrieval might be in other investment risk measures, especially in portfolio analysis. Opportunities for anomaly studies and stock and bond valuation are

available in a way that was impossible a decade ago. Students of investments can use online data to develop their confidence in many of the empirical topics from modern textbooks and classes.

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STUDENT LEARNING PERCEPTIONS: EVIDENCE FROM AN INTRODUCTORY ACCOUNTING COURSE

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ABSTRACT

This study sought to examine students' perceptions of their learning experience in the introductory accounting courses at three colleges and universities in the United States. Questionnaire responses were collected from 375 students at the end of the second introductory course. The student population consisted primarily of business students. The study identified a set of six factors that represent students' learning experience in introductory accounting. The identified set includes: accounting basics, how to learn, job satisfaction, accounting agencies, career opportunities, and career prestige. These study results provide important feedback for the process of redesigning undergraduate accounting curricula to improve students' learning experience in the introductory courses.

JEL: A22, A23, M40

KEYWORDS: introductory accounting; student perceptions; business education; accounting curricula.

INTRODUCTION

This paper presents the results of a study made to examine students' perceptions of their learning experience in the introductory accounting courses at three colleges and universities in the United States. The questionnaire responses from students provide valuable feedback to educators to determine if we are meeting course objectives and if we are attracting quality students to the accounting major. According to the Accounting Education Change Commission (AECC, 1992), the primary objective of the introductory courses in accounting is for students to learn about accounting as a communication function to support decision making. The students' learning experience in the introductory courses has a significant impact on the decision to major in accounting. Therefore, the courses should be designed to ensure that students have the requisite accounting skills as they enter the business world and be designed to attract the "best and the brightest" business majors to accounting.

There have been calls for change in accounting education since the Bedford Report in 1986 (AAA, 1986). The American Accounting Association (AAA) appointed the AECC in 1989 to improve the academic preparation of accountants. In that same year, the chief executives of the largest accounting firms presented their position on accounting education. They reported that major changes in the business world had not been integrated into the accounting curriculum (Kullberg et al., 1989). Today, we have an ongoing preparation gap in accounting education (Siegel, Sorensen, Klammer, & Richtermeyer, 2010). Accounting educators and the business community must identify the knowledge, skills, and abilities for graduates to be successful in the business world. It is time to make substantive changes to course content, curricula, and technology in accounting education.

Today, the development of the appropriate accounting curriculum is complicated by a variety of forces. McCuddy (2007) has identified four significant forces. First, organizations are operating in an increasingly global economy. Second, decisions must be made in a fast and rapidly changing world. Third, it is necessary to consider the impact of technology on people and organizations. Fourth, there is a crisis of ethics and values in economic, social, and political institutions. Chang, Landis, & Yu (2011) suggest that the accounting profession is in a state of transformation. "The profession is entering a world

with one set of global standards and encountering new technologies. Corporations are demanding continuous auditing, and financial institutions are creating complex networks of asset and liability claims" (p. 32). For the accounting profession to be successful in the future, it is imperative that educators make substantive changes to accounting curricula and ensure that graduates can meet the skill needs of the business community.

The two introductory accounting courses, financial and managerial, should be designed to provide necessary decision making skills as well as to foster respect and interest in the accounting profession. To investigate necessary curricular changes, questionnaire responses were collected from 375 students at the end of the second introductory accounting course. The results of this study identified a set of six factors that represent students' learning experience in the introductory accounting courses. The identified set includes three factors that are focused on learning: *accounting basics, how to learn, and accounting agencies.* The set also includes three factors that are focused on the accounting profession: *job satisfaction, career opportunities, and career prestige.* High scores were reported for *accounting basics*. This is encouraging. Students indicate that they understand that accounting provides decision making information used by investors, creditors, and others. High scores were also reported for *job satisfaction* and *career prestige.* This indicates that students understand the financial aspects of working in accounting and appear to value the role of accounting in society. The student responses on *how to learn, accounting agencies,* and *career opportunities* suggest room for curricular improvement.

The following sections of this paper present the literature review, data and methodology, results and discussion, and concluding comments.

LITERATURE REVIEW

Change in accounting education has been under scrutiny since the issuance of the Bedford Report. In 1986, the Bedford Committee of the American Accounting Association (AAA) assessed the state of accounting education (AAA, 1986). The committee's report stated that massive changes had taken place in the business environment—particularly in technology and social values. However, at the same time, academic institutions had failed to evolve as rapidly as business practice. As a result ". . . a complete reorientation of accounting education is needed" (pp. 171-172).

In 1989, the chief executives of the eight largest public accounting firms presented their position on education for the accounting profession. The theme was the same as stated by the Bedford Committee: accounting education had not kept up-to-date with business needs. Curricular change was mandatory for accounting degree programs and for the introductory accounting courses as well (Kullberg et al., 1989, p. 1).

The AECC was appointed in 1989 by the AAA. The primary objective of the AECC was to be a catalyst for improving the academic preparation of accountants. The AECC stated that the primary objective of the introductory courses in accounting is "for students to learn about accounting as an information development and communication function that supports economic decision making" (AECC, 1992, p. 2). This primary objective was in sharp contrast with the long-held objective which has been to teach bookkeeping essentials to accounting majors. In traditional curricula, the introductory courses are viewed as the first courses in accounting (for accounting majors) rather than the only (and last) courses in accounting for business majors (Baldwin & Ingram, 1991, pp. 3-4).

In 2001, the AAA, the Institute of Management Accountants (IMA), the American Institute of Certified Public Accountants (AICPA), and the Big Five public accounting firms sponsored a study on the future of accounting education. Albrecht and Sack (2001) were the researchers for this study and they observed three major developments in the business environment: technology, globalization, and investor power in

the capital markets. It was the opinion of the researchers that these developments have not been systematically integrated into accounting education. They suggested substantive changes to the accounting educational model in the following areas: course content and curricula, pedagogy, technology, faculty development and reward system, and strategic direction.

Siegel, Sorensen, Klammer, and Richtermeyer (2010) suggest that accounting education is not appropriately synchronized with the needs of students and employers. They suggest that the undergraduate accounting curriculum has stagnated. While the business world has moved to a global focus and legislative initiatives, such as the Sarbanes-Oxley Act (SOX), have altered business practices, the traditional accounting curriculum continues to be focused on transactions and accounting rules. Business graduates need to acquire the skills to support decision making and performance management. "These activities are not represented appropriately in the accounting curriculum" (p. 29).

In an effort to improve accounting education, a number of researchers have studied students' perceptions of accounting courses. Nelson, Vendrzyk, Quirin, and Kovar (2008) report the sophomore year in college is the most common year for selecting accounting as a major. Students typically take the first introductory accounting course in their sophomore year. Therefore, it is important for that first course to give students a good impression of accounting. Geiger and Ogilby (2000) found from their study of students' perceptions that students' experiences in the first course were major factors in the decision to major in accounting. However, Chen, Jones, and McIntyre (2004) reported that accounting and non-accounting students did not perceive much value for the first accounting course. Jones and Fields (2001) found that the technical demands of introductory accounting lead to discouragement, failure, and overall poor student perceptions of the accounting profession and curriculum. Francisco, Noland, and Kelly (2003) report that "quality of work" issues are the most significant issues raised by students. Students thought accounting work was uninteresting and boring. These study results suggest that students do not know what accounting is and do not understand what accountants do.

This project was designed to obtain the perceptions of undergraduate business and non-business students about their learning experience in the introductory accounting courses. Since the learning experience in the introductory courses has a significant impact on a student's decision to major in accounting, the courses should be designed to provide a positive learning experience and to attract the "best and the brightest" business majors to accounting.

DATA AND METHODOLOGY

The questionnaire specifically developed for this study contained 59 items. The instrument measured the students' perception of the following six factors related to their learning experience in the introductory accounting courses: *accounting basics, how to learn, job satisfaction, accounting agencies, career opportunities,* and *career prestige.*

Respondents were first asked to indicate the extent to which they agreed or disagreed with each of 47 statements related to their experience with the introductory accounting courses using a five-point Likert scale ranging from '1 = strongly disagree' to '5 = strongly agree'. Secondly, the respondents were asked to indicate their perceptions of the importance of 12 characteristics of the accounting profession on a five-point Likert scale from '1 = not at all important' to '5 = extremely important'. In addition to the 59 questionnaire items, the respondents were asked to provide demographic information including: major, rank, grade point average (GPA), and gender.

The target population included business and non-business students at three universities/colleges in the United States. A survey of the students, who had completed the two introductory accounting courses, should provide a representative picture of students' perceptions of their learning experience in accounting

principles. The same questionnaire was administered to all three schools. There were 375 student survey respondents. The reported responses varied from 367 to 375 due to nonresponse on certain questionnaire items.

The 59 items in the survey were subjected to a confirmatory factor analysis to ensure consistency and unidimensionality. The factor analysis employed the Varimax Normalization Rotation Method, using Principal Components Analysis as the extraction method. Only factors with eigenvalues equal to or greater than one were considered.

Of the 59 items in the questionnaire, 49 loaded on six scales. The ten non-contributing items were deleted. The developed scales exhibited good to satisfactory reliability levels (Nunally, 1970). The Cronback alphas ranged from a high of .965 to a low of .745 indicating high reliability for all derived scales (see Table 1). The individual items loading on each scale are shown in Appendix A.

Table 1: Learning Experience Scales Developed with Mean Responses

Scales	No. Items	Cronback's Alpha
Learning Experience		
1. Accounting basics	24	.965
2. How to learn	7	.909
3. Job satisfaction	6	.860
4. Accounting agencies	6	.843
5. Career opportunities	3	.838
6. Career prestige	3	.745

This table shows the six Learning Experience (LE) scales and the related Cronback's Alpha.

RESULTS AND DISCUSSION

This study was conducted to investigate the perceptions of business and non-business students regarding their learning experience in the two introductory accounting courses. The student responses to the individual items on the learning experience section of the questionnaire were used to develop six scales or constructs that may be used to describe the learning experience in the introductory accounting classes. The student perceptions were noted on a scale of '1' (lowest agreement or importance) to '5' (highest agreement or importance).

Overall Means

As shown in Table 2, the three scales that received the highest mean scores out of '1' to '5' in this study were *job satisfaction* (4.13)*, accounting basics* (3.95), and *career prestige* (3.72). These results are similar to the results of Francisco, Noland, and Kelly (2003). Their study of business majors identified 'long term salary prospects' and the 'prestige of the accounting profession' to be the most important factors for students. The perceived importance of *job satisfaction* and *career prestige* indicates that it may improve the recruiting of quality students if these aspects of a career in accounting are stressed in the introductory accounting classes. The current state of the economy may also be influencing students' opinions of professions/jobs that pay well.

The overall mean score for the factor *accounting basics was* 3.95 indicating a response very close to 'agreement' with statements that described their learning experience in the introductory accounting classes. This construct included items dealing with the following: the principles underlying the accounting information system, understanding accounting as an information development and communication function, and how accounting is used by investors and creditors. This factor could be viewed as the primary objective of the introductory accounting classes as defined by the AECC (1992). Therefore, a score close to 'agreement' may be considered a positive response.

Table 2: Overall Means for Learning Experience Scales in Descending Order

Scale No.	Scale	Overall Mean
3.	Job satisfaction	4.127
1.	Accounting basics	3.947
6.	Career prestige	3.715
2.	How to learn	3.448
4.	Accounting agencies	3.310
5.	Career opportunities	3.166

This table shows the overall mean scores for the six LE scales.

How to learn, accounting agencies, and *career opportunities* were given scores of 3.45, 3.31, and 3.17, respectively. These scores are slightly above 'neutral' and indicate only a modestly positive perception of the learning experience perceived by the students. This outcome should be a warning. This assessment does not indicate that educators are doing the best job possible in all areas of the introductory accounting curriculum. Improvements should be made in teaching students how to learn and to promote life-long learning. In addition, students should be made more aware of the career opportunities in the accounting profession.

Based on the developed scales, we compared the overall means for six learning experience constructs across the three school samples by the following dimensions: major, rank, gender, and grade point average (GPA). Where appropriate, the Scheffe pairwise comparison method was used to compare the means by dimension for the six learning experience scales. The Scheffe test was used because it provides protection from Type 1 errors and it requires a larger sample mean difference before it concludes that a difference is significant (Gravetter & Wallnau, 2004; Hair, Anderson, Tatham, & Black, 1998).

Scale Means by Major

As noted in Table 3, the six scale means were compared for three classifications of majors: accounting, finance, and all other majors. There were statistically significant differences on five of the six scales (83.3%). The only scale mean that did not exhibit a statistically significant difference across the majors was *career prestige.* It can be noted that the finance majors and all other majors do not appreciate the *career opportunities* in accounting as highly as the accounting majors. Both accounting majors and finance majors rated all of the six scales higher than other majors.

All major classifications gave a moderate to high rating to all six of the scales on learning experience. It might be expected that the accounting majors gave the highest rating to these learning experience factors ranging from 3.54 to 4.35 out of a possible '5.' However, the introductory accounting courses are service courses and it should be noted that the majors other than accounting and finance perceived their learning experience to be neutral/moderate to agreement with ratings on the six factors ranging from a low of 2.82 (*career opportunities)* to a high of 4.03 (*job satisfaction)*. Again, this should be a warning to educators.

Table 3: Learning Experience Scale Means by Major (Accounting, Finance, and Others)

No.	Scale	1 Accounting Mean	2 Finance Mean	3 Other Major Mean	Total Mean	F-Values	Significance
1.	Accounting basics	4.316	4.014	3.794	3.961	12.463	***
2.	How to learn	3.844	3.577	3.258	3.461	13.657	***
3.	Job satisfaction	4.348	4.182	4.025	4.132	5.905	***
4.	Accounting agencies	3.542	3.450	3.180	3.324	6.919	***
5.	Career opportunities	3.949	3.298	2.821	3.180	34.213	***
6.	Career prestige	3.821	3.841	3.627	3.721	2.781	ns

*This table shows the LE scale means for three major classifications and the related F-Values. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.*

Table 4 reports the paired comparisons for three classifications of majors: accounting, finance, and all other majors. For the pairwise comparison of responses on learning experience for accounting vs. others (excluding finance), see Table 4, Panel A. There were five statistically significant differences of the six learning experience scales (83.3%). For the pairwise comparison of responses on learning experience for finance vs. others (excluding accounting), see Table 4, Panel B. There were three statistically significant differences of the six learning experience scales (50.0%). For the pairwise comparison of responses for accounting vs. finance, see Table 4, Panel C. There were two statistically significant differences of the six learning experience scales on *accounting basics* and *career opportunities* (33.3%).

Table 4: Significant Learning Experience Scale Mean Differences between Major Paired Groups

Panel A: 1 = Accounting vs. 3 = Other Majors					
No.	**Scale**	**Mean Difference**	**Standard Error**	**Significance Value**	**Significance**
1.	Accounting basics	.5220	.1057	.000	***
2.	How to learn	.5866	.1165	.000	***
3.	Job satisfaction	.3231	.0963	.004	***
4.	Accounting agencies	.3622	.1083	.004	***
5.	Career opportunities	1.128	.1379	.000	***
Panel B: 2 = Finance vs. 3 = Other Majors					
2.	How to learn	.3190	.1134	.020	**
4.	Accounting agencies	.2709	.1064	.040	**
5.	Career opportunities	.4779	.1332	.002	***
Panel C: 1 = Accounting vs. 2 = Finance					
1.	Accounting basics	.3019	.1226	.050	**
5.	Career opportunities	.6503	.1610	.000	***

*This table shows the LE scale mean differences between major paired groups and the related significance values. Panel A shows accounting vs. other majors. Panel B shows finance vs. other majors. Panel C shows accounting vs. finance. ***. **, and * indicate significance at the 1, 5, and 10 percent levels respectively.*

The accounting majors and the finance majors have significantly different perceptions of their learning experience in the introductory accounting courses when compared with all other majors. The results indicate that the accounting majors and the finance majors have similar perceptions of their learning experience and view of the accounting profession. Given the similar characteristics of these two student populations, accounting academics should take the opportunity to ensure that the students who are interested in finance clearly understand the career opportunities in accounting.

Scale Means by Rank

As noted in Table 5, there were five statistically significant differences when the means were compared across the rank dimension (83.3%). The ranks included freshman, sophomore, junior, and senior. Overall, the six factors were rated from a low of 3.17 (*career opportunities*) to a high of 4.13 (*job satisfaction*) indicating a perception of neutral/moderate to agreement with the learning experience statements. The only scale that did not exhibit a statistically significant difference across the ranks was *career prestige*.

Table 5: Learning Experience Scale Means by Rank

No.	Scale	1 Freshman Mean	2 Sophomore Mean	3 Junior Mean	4 Senior Mean	Total Mean	F-Values	Significance
1.	Accounting basics	4.021	4.102	3.805	3.542	3.947	7.139	***
2.	How to learn	3.341	3.638	3.312	2.959	3.448	8.265	***
3.	Job satisfaction	4.128	4.210	4.077	3.876	4.127	2.749	**
4.	Accounting agencies	3.444	3.513	3.112	2.841	3.310	11.420	***
5.	Career opportunities	3.590	3.405	2.946	2.488	3.166	10.697	***
6.	Career prestige	3.462	3.779	3.682	3.569	3.715	1.285	ns

*This table shows the LE scale means for four rank classifications and the related F-Values. ***, **, and * indicate significance at the 1, 5, and 10 percent levels.*

The student perceptions of *career opportunities* significantly declined at each classification level from freshman to senior. This outcome is troubling. Many students select their major during the sophomore year. Accounting educators should ensure that students are made aware of and appreciate the job opportunities that are available in the accounting profession. The U. S. Bureau of Labor Statistics estimates 22 percent growth in accounting and auditing jobs in the decade between 2008 and 2018 (Anonymous, 2011). Given the current economic condition of the United States, this prediction of growth in accounting should encourage interest in the profession.

It may be of interest to note that the seniors rated all six scales lower than the overall mean. Generally, seniors are not enrolled in the introductory classes. If they are, it may be that they are repeating the courses because of prior failures. Therefore, their perceptions of the learning experience may not be similar to those students classified as sophomores or juniors.

For the pairwise comparison of responses on learning experience for freshmen vs. seniors, see Table 6, Panel A. There was only one (1) statistically significant difference of the six learning experience scales (16.7%) for *career opportunities*. For the pairwise comparison of responses on learning experience for sophomores vs. juniors, see Table 6, Panel B. There were four statistically significant differences of the six learning experience scales (66.7%). For the pairwise comparison of responses for sophomores vs. seniors, see Table 6, Panel C. There were again four statistically significant differences of the six learning experience scales (66.7%).

Table 6: Significant Learning Experience Scale Mean Differences between Rank Paired Groups

Panel A: 1 = Freshman vs. 4 = Senior					
No.	**Scale**	**Mean Difference**	**Standard Error**	**Significance Value**	**Significance**
5.	Career opportunities	1.102	.3452	.018	**
Panel B: 2 = Sophomore vs. 3 = Junior					
1.	Accounting basics	.2962	.0951	.023	**
2.	How to learn	.3255	.1055	.024	**
4.	Accounting agencies	.4006	.0950	.001	***
5.	Career opportunities	.4588	.1288	.006	***
Panel C: 2 = Sophomore vs. 4= Senior					
1.	Accounting basics	.5599	.1378	.001	***
2.	How to learn	.6785	.1495	.000	***
4.	Accounting agencies	.6714	.1357	.000	***
5.	Career opportunities	.9170	.1862	.000	***

*This table shows the LE scale mean differences between rank paired groups and the related significance values. Panel A shows freshman vs. senior. Panel B shows sophomore vs. junior. Panel C shows sophomore vs. senior. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.*

The statistically significant differences between sophomore vs. junior and sophomore vs. senior were for *accounting basics, how to learn, accounting agencies,* and *career opportunities.* The fact that the student perceptions of these learning experience factors decline significantly as the students advance through their

academic programs is troubling. These perceptions should be considered by accounting academics as changes are made to the introductory courses. The introductory courses must provide students with essential knowledge about the basics of accounting and also give students life-long tools for how to learn.

Scale Means by Gender

As shown in Table 7, there were no statistically significant differences in the mean scores of students when compared by gender. However, the females rated *job satisfaction* (4.22) and *career prestige* (3.81) higher than the males (although not statistically significant). This suggests an increased interest by female students in the accounting profession. At the same time, the female students gave a slightly lower rating to *career opportunities* (3.15) indicating a moderate appreciation for accounting job opportunities for women. Given the prediction for growth in accounting and auditing jobs, female students should be encouraged to consider an accounting degree.

Table 7: Learning Experience Scale Means by Gender

No.	Scale	1 Male	2 Female	p-Values	Significance
1.	Accounting basics	3.976	3.900	.403	ns
2.	How to learn	3.506	3.360	.145	ns
3.	Job satisfaction	4.075	4.223	.062	ns
4.	Accounting agencies	3.333	3.278	.543	ns
5.	Career opportunities	3.180	3.148	.795	ns
6.	Career prestige	3.661	3.813	.092	ns

This table shows the LE scale means by gender and the related p-values. ns indicates no statistically significant difference.

Scale Means by GPA

As shown in Table 8, the overall six learning experience scale means for four GPA levels were compared. The GPA classification levels included: (1) 3.6 to 4.0, (2) 3.0 to 3.5, (3) 2.5 to 2.9, and (4) below 2.5. There were two statistically significant differences in the mean scores of students classified by GPA. The significantly different ratings were for *accounting basics* and for *career opportunities* (33.3%). The overall scale means by GPA ranged from a low of 3.17 (*career opportunities)* to a high of 4.14 (*job satisfaction*). This may be considered a modestly positive outcome. Except for *accounting basics* and *career opportunities,* the learning experience in the introductory accounting classes was relatively constant across the GPA classifications and perceived to be more than moderate. Whether the students had a good GPA (3.6-4.0) or a poor GPA (below 2.5), the perceptions of four of the factors on learning experience were similar. It is of interest to note that the poor students gave scores to the following scales that were higher than the better students: *how to learn, career opportunities,* and *career prestige.*

Table 8: Learning Experience Scale Means by GPA Group

No.	Scale	1 3.6– 4.0	2 3.0 – 3.5	3 2.5 – 2.9	4 Below 2.5	Total Mean	F-Values	Significance
1.	Accounting basics	4.224	3.862	3.794	4.191	3.943	4.942	***
2.	How to learn	3.616	3.410	3.281	3.786	3.448	2.347	ns
3.	Job satisfaction	4.185	4.131	4.103	4.111	4.138	.187	ns
4.	Accounting agencies	3.539	3.250	3.169	3.352	3.308	3.136	ns
5.	Career opportunities	3.424	3.130	2.880	3.433	3.167	3.225	**
6.	Career prestige	3.611	3.778	3.657	3.800	3.713	.962	ns

*This table shows the LE scale means for four GPA groups and the related F-values. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.*

For the pairwise comparison of responses for GPAs of 3.6-4.0 vs. 3.0-3.5, see Table 9, Panel A. There was one significantly significant difference (16.7%). For the pairwise comparison of responses for 3.6-4.0 vs. 2.5-2.9, see Table 9, Panel B. There were two statistically significant differences (33.3%). These statistically significant differences on *accounting basics* and *career opportunities* appeared between the good students (3.6-4.0) and the average students (3.0-3.5 and 2.5-2.9).

Table 9: Significant Learning Experience Scale Mean Differences between GPA Paired Groups

Panel A: 1 = 3.6 to 4.0, 2 = 3.0 to 3.5					
No.	**Scale**	**Mean Difference**	**Standard Error**	**Significance Value**	**Significance**
1.	Accounting basics	.3626	.1068	.010	***
Panel B: 1 = 3.6 to 4.0, 3 = 2.5 to 2.9					
1.	Accounting basics	.4303	.1338	.017	**
5.	Career opportunities	.5440	.1834	.034	**

*This table shows the LE scale mean differences between GPA paired groups and the related significance values. Panel A shows '3.6 to 4.0' vs. '3.0 to 3.5'. Panel B shows '3.6 to 4.0' vs. '2.5 to 2.9'. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.*

The rating on *accounting basics* by the good students (3.6-4.0) was significantly higher than the rating given by average students (3.0-3.5 and 2.5-2.9). Although this result may be expected, accounting teachers must improve efforts to provide all students with the essential knowledge of accounting. This is the primary goal of the introductory courses. There is a similar result with *career opportunities.* The good students (3.6-4.0) rated this factor significantly higher than the average students (3.0-3.5). Average students may be intimidated by the course content of introductory accounting. As a result, they do not seriously consider the *career opportunities* that are presented in accounting.

CONCLUDING COMMENTS

This paper reports the results of a study made to examine students' perceptions of their learning experience in the introductory accounting courses at three colleges and universities in the United States. Questionnaire responses were collected from 375 students at the end of the second introductory accounting course. In our review of the students' perceptions of their learning experience in the introductory accounting classes, the highest mean scores were given to *job satisfaction, accounting basics,* and *career prestige.* The students understand and value the financial aspects of working in accounting. They appear to value the role that accounting plays in our society. In addition, the students appear to value the *accounting basics* that are taught in the introductory accounting classes. This agreement rating for *accounting basics* is encouraging. It is a primary purpose of the introductory accounting classes to teach students the principles of accounting and have them understand that accounting provides decision making information used by investors, creditors, and other users. The student ratings of factors such as *how to learn, accounting agencies,* and *career opportunities* were more than 'neutral' but less than 'agreement' with the questionnaire statements. The responses suggest that there is room for improvement. We as educators can do better in designing the introductory accounting curriculum. Again, it is time to review the topic coverage, pedagogy, and ways to promote the career opportunities in accounting.

There are suggestions for future research focused on introductory accounting. A survey of faculty members and business professionals could identify topics and level of coverage for the principles courses. A survey of business professionals could identify the knowledge, skills, and abilities that are necessary for success in the accounting profession.

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APPENDICES

Appendix A: Scales for: Introductory Accounting Learning Experience

Accounting basics (24 items, .965 alpha)		
18	taught me the financial statements and their accounts	
12	taught me the elements of financial statements	
11	taught me the fundamental accounting concepts	
20	taught me normal balances	
19	taught me account classifications	
45	taught me the uses of financial statements	
9	helped me to understand the basic features of accounting	
23	taught me how a transaction affects financial statements	
40	showed me that a strong understanding of accounting may increase my chances of success in business	
7	taught me that accounting supports economic decision making	
33	demonstrated to me why accounting information is important	
13	helped me to appreciate the role of accounting	
21	taught me the steps in the closing process	
43	taught me to use debits and credits to record transactions	
10	helped me to understand the principles underlying the accounting information systems	
17	taught me the accounting cycle	
8	gave me a broad view of accounting's role in providing society's need for information	
34	demonstrated to me how accounting information can be used	
41	taught me how accounting meets the information needs of investors and creditors	
6	taught me that accounting is an information development and communication Function	
22	promoted a desire to learn the accounting concepts	
14	enhanced my analytical skills	
26	taught me the role of the managerial accountant	
42	taught me to memorize accounting rules	
How to learn (7 items, .909 alpha)		
	3	educated me in identifying problems
	2	educated me in procedures to research an issue
	1	taught me how to learn
	4	taught me how to arrive at an informed conclusion
	5	helped me to develop an attitude of lifelong learning
	24	helped me to think and develop reasoning skills
	15	enhanced my ability to confront unstructured problems
Job satisfaction (6 items, .860 alpha)		
	52	long-term job opportunity
	53	job security
	50	availability of employment
	57	job satisfaction
	59	starting salary
51	attractive lifestyle	
Accounting agencies (6 items, .843 alpha)		
28	taught me the role of agencies such as the FASB	
27	taught me the role of the auditor	
29	are focused on the financial statement preparer	
30	are focused on the financial statement user	
44	increased my ability to communicate	
31	provide coverage of ethical issues in accounting	
Career opportunities (3 items, .838 alpha)		
38	showed me that the field of accounting is exciting	
36	increased my interest in the field of accounting	
37	helped me to understand the career opportunities in accounting	
Career prestige (3 items, .745 alpha)		
55	challenging work environment	
56	prestige	
54	social status	

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PROFILING AND THE STUDENT PROJECT PEER APPRAISAL PROCESS

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ABSTRACT

Past research on team formation and composition reveals that team member attributes play a role in how students perceive each others' contributions to a team project. Can attribute-based profiling be used during the peer appraisal process so that a holistic-based assessment tool can still provide meaningful feedback to the student being rated? Our study shows that students can develop a profile of the "ideal team member" at the start of the project that is consistent with their overall assessment of a team member's performance at the end of the process.

JEL: A23

KEYWORDS: peer appraisal, student teams

INTRODUCTION

The use of group projects in higher education has grown progressively over the years, ostensibly because employers view the ability to work effectively in a team as an essential skill (Holt, et al., 1997). Guzzo and Dickson (1996) stated that one of the ways in which educators assess the effectiveness of student project teams is when the students' experiences provide developmental outcomes for those involved. According to Hartenian (2003), team training and experiences positively correlate with team knowledge, skills and abilities. The opportunity for students to get feedback about their performance in these project teams, therefore, is an essential part of the learning process.

Feedback about individual student performance in teams is often obtained from peer assessments since direct observation by the instructor is usually not feasible. Several studies have shown that given the choice, students prefer to rate their peers using a holistic approach that provides a "big picture" view of their satisfaction with their peers' contribution to the overall team experience and outcome. A category-based peer appraisal approach, however, can provide more meaningful feedback on a student's teamwork knowledge, skills and abilities for developmental purposes. This latter approach, that asks students to evaluate their peers on several criteria at the end of the project, however, have been found to result in lower motivation among students to take the peer appraisal process seriously. This category-based approach is also more difficult when a student's performance within the group is part of the grading process for the course.

This paper discusses the benefits of having a peer appraisal process that combines category-based and holistic-based approaches. It will be shown that a peer appraisal process that asks students to develop an attribute profile of their ideal team member at the beginning of the project can be used to provide feedback about the teamwork skills and abilities of students who receive poor and excellent holistic ratings at the end of the project using data collected for this purpose. The benefits and limitations of this profile-based peer appraisal approach, and possible future research directions are then discussed.

LITERATURE REVIEW

The use of self and peer appraisal in the classroom has been widely reported in the literature (Boud & Falchikov, 2007, Goldfinch, 1994, Goldfinch & Raeside, 1990). During self appraisal, a student judges his or her own performance, while in peer appraisal he or she judges the performance of others (Falchikov & Goldfinch, 2000). In both of these instances, students are applying criteria, standards and making judgments (Falchikov & Goldfinch, 2000).

Peer appraisal is grounded in active learning and adult learning principles (Cross, 1981). McAuley and Henderson (1984) purport that peers can identify personal strengths and weaknesses better than other members of an organization. Peer ratings hold promise for providing accurate assessment of job performance (Borman, 1991). In addition, peer appraisal has benefits in terms of promoting learning (e.g., Falchikov, 1986, Boud, 1988).

A peer appraisal process is often considered as an integral part of student team projects since team members are more privy to the inner workings of the group compared to an external observer (Russell, et al., 2006). The assessment of individual team member contributions has a practical value to the instructor since it is used as reference when determining the students' grades on the project. However, students have reported that the use of peer appraisal also encourages team cooperation, commitment and increased engagement among team members (Willey & Gardner, 2009). These outcomes are critical since social loafing can lead to lower student satisfaction with the teamwork experience (Schultz, et al., 2010).

There are two common formats generally used to assess team member contributions. A holistic-based approach lets a student give an overall appraisal of a team member's performance. This method is most convenient when used as basis for assigning an individual grade for the student's contribution to the project. A category-based approach, on the other hand, affords a student the opportunity to rate a team member on several criteria that are deemed as important for effective teamwork. This format has been found to improve team member performance (Erez & Somech, 1996), increase commitment (Willey & Gardner, 2009) and reduce social loafing (Brooks & Ammons, 2003). Lejk and Wyvill (2001) suggested that a category-based assessment process is useful in generating feedback about teamwork skills for developmental purposes.

Friedman, Cox and Maher (2008) found, however, that students prefer the holistic-based approach to the category-based approach. They concluded that an overall rating of team members at the end of the project gives the rater more flexibility in distributing a team member's contribution to those criteria that they considered as relevant. The students' higher motivation to rate holistically can also be driven by the convenience of a shorter assessment form, especially when done toward the end of the term.

Russell, Haritos and Combes (2006) suggested that there is a need to establish clear evaluation criteria that can guide student appraisers even if a holistic approach to assessment is used. If evaluation criteria are an essential part of an effective peer appraisal process, can it be used to interpret the holistic assessments provided by team members at the end of the project? Such an assessment process, thus, can incorporate the developmental benefits of a category-based format and the practical advantages of a holistic approach.

A PROFILE-BASED APPROACH TO PEER APPRAISAL

This study tested an assessment method that combines category-based and holistic-based approaches to student team peer appraisal. The method employs a two-stage process that first asks students for the attributes of their most ideal team member from a list provided by the instructor at the start of the project. The student is then told to provide a holistic rating of his or her team members according to their

contributions to the project at the end of the term. Allowing students to establish a profile of an ideal member sets the stage for interpreting the holistic ratings they give to their teammates at the end of the project. An instructor-guided but student-defined profile is also beneficial if they are to take this assessment seriously (Goode & Teh, 2005). Having students develop the profile at the start of the project process and holistic ratings at the end also optimizes the rise and fall of student motivation levels during the project process as discovered by Friedman, Cox and Maher (2008).

The attributes used in forming the profile are derived from the list developed by Connerley and Mael (2001). Their study tested fifty-one team member attributes that could matter to students when selecting and assessing team members. The thirty attributes that were included in the list provided to the students in this study were those found to be significantly correlated with student satisfaction with a team member. These attributes were also deemed by the instructors as relevant to the context of their courses. The attributes represented five conceptually defined dimensions: academic attitudes, abilities and relevant experience, intrapersonal temperament, interpersonal and work preferences (refer to Table 1).

Students are asked to specify the importance of each of these attributes to their profile of an ideal team member before they actually selected team members. Levine and Moreland (1990) suggested that students selecting their own teams often choose team members based on friendships and convenience. Letting students develop a profile before they select team members can reduce the chance that the criteria they select will be tailor-fitted to the composition of their team. Tailoring the profile to selected teammates can eliminate potential feedback on deleted attributes that could otherwise be essential for an "ideal team member."

This appraisal method then asks the students to rank team members according to their contributions to the project. It is expected that the students will use the profile they developed during the first stage when ranking their team members at the end of the project. The holistic-based ranking can then be interpreted in light of the profile developed by each rater. Each student can then receive feedback on their performance in each criterion without having students rate each other on each attribute at the end of the project when their low motivation to do so could render their assessment meaningless.

METHODOLOGY

To test the validity of this approach, the authors modified the second stage of the process by asking the students to rate their team members along the same attributes as those presented at the start of the project. Those team members that were adjudged to have contributed the most to the project should score highly on attributes that were deemed to have the largest positive impact on team performance. Those who were deemed to have contributed the least should score poorly on the same attributes.

The sample consisted of 187 junior and senior-level college students at a mid-sized regional university. The students were enrolled in either one of two different courses that each required a semester-long team project. Students formed their teams made up of three to five members each.

Data were collected in two stages. During the first stage, each student was asked to express his or her opinion on the extent to which thirty attributes of his or her *ideal* team member should contribute to team performance (-2 = very negative contribution, -1 = negative contribution, 0 = no contribution, 1 = positive contribution, 2 = very positive contribution). This survey was administered before students formed their teams. To match their responses with those taken during the second stage of data collection, students were asked to provide identification codes. The second stage of data collection consisted of a survey that was administered after completion of the project and before the project grades were released. Each respondent was asked to evaluate the contribution of the team member who contributed the *most* and who contributed the *least* along the same thirty attributes using the same scale as the first survey. Respondents

did not have access to their responses collected at stage one. Their responses were then matched with those from the first stage using the identification codes provided earlier. Item means were calculated for each attribute and compared across the two stages of data collection.

RESULTS

Table 1 shows the mean response to each attribute as it relates to the team member that contributed the *least* to the project, the *ideal* team member, and the member that contributed the *most*, respectively. Table 1 also shows the results of t-tests between these means to see if their differences are statistically significant. The data suggested that as a group, students in our sample gave those they deemed to have contributed the *most* with higher ratings than their *ideal* team member along 29 out of 30 team member attributes. The only attribute that did not show any significant difference related to the team member's *Dependability to show up at meetings*. It is noteworthy that this attribute had the highest mean score for the ideal member suggesting that this is the most important attribute for the students sampled.

Table 1: Sample Means and Results of t-tests

Attribute of a team member	(a) Mean response about team member who contributed least to the project	(b) t-statistic Difference between (c) and (a)	(c) Mean response about the ideal team member	(d) t-statistic Difference between (c) and (e)	(e) Mean response about team member who contributed most to the project
Academic attitudes					
Major	0.64	-3.198***	0.34	-11.445***	1.20
Importance placed on team assignment	0.65	5.557***	1.13	-9.734***	1.60
Attitude toward school in general	0.56	3.397***	0.88	-8.423***	1.38
Attitude toward this class	0.49	4.665***	0.89	-7.204***	1.34
Attitude toward hard work	0.65	7.377***	1.34	-5.607***	1.62
Importance placed on grades	0.67	6.570***	1.22	-7.556***	1.61
Desired grade in class	0.80	8.592***	1.50	-2.791***	1.65
Ability and relevant experience					
Ability to express written thoughts	0.57	10.077***	1.35	-5.429***	1.64
Ability to communicate orally	0.72	10.710***	1.58	-2.661***	1.72
Resourcefulness	0.57	9.652***	1.42	-3.098***	1.57
Ability to brainstorm	0.75	7.219***	1.32	-3.210***	1.51
Experience conducting research	0.68	3.638***	1.00	-7.055***	1.45
Creativity	0.61	5.296***	1.08	-6.398***	1.47
Writing skills	0.45	5.972***	1.01	-9.216***	1.58
Fluency in English	1.22	0.218	1.24	-9.744***	1.84
Previous team experience	0.80	-2.142**	0.64	-13.034***	1.48
Intrapersonal temperament					
Dependability to show up at meetings	0.74	9.721***	1.74	-0.535	1.76
Ability to be self-motivated	0.65	8.074***	1.36	-6.469***	1.67
Friendliness	1.23	-2.131**	1.05	-10.880***	1.69
Ability to work under pressure	0.71	5.868***	1.20	-6.608***	1.62
Sense of responsibility	0.59	10.402***	1.49	-4.219***	1.70
Attitude toward early versus last minute	0.53	5.675***	1.04	-4.406***	1.37
Interpersonal					
Ability to work well in groups	0.95	8.538***	1.56	-2.292**	1.68
Ability to get along with others	1.21	2.122**	1.34	-8.462***	1.77
Attitude toward carrying own workload	0.56	7.682***	1.29	-8.474***	1.72
Ability to compromise	1.00	2.546**	1.21	-5.918***	1.50
Personality (shy or outgoing?)	0.90	-2.461**	0.63	-11.832***	1.48
Desire to voice opinion in group	0.82	1.957*	0.99	13.633***	1.67
Work preferences					
Ability to work late nights with group	0.59	1.780*	0.72	-8.594***	1.33
Willingness to work weekends	0.62	-0.114	0.62	-9.427***	1.30

*The students were asked to assess their ideal team member and actual team members along the thirty attributes (organized into five dimensions) indicated on the left column. The means responses to each attribute of the student sample are indicated in columns (a), (c) and (e) using the following scale: -2 = very negative contribution, -1 = negative contribution, 0 = no contribution, 1 = positive contribution, 2 = very positive contribution. The t-statistics resulting from a paired sample test of differences between means are shown in columns (b) and (d). The significance of each t-statistic is indicated at the 1, 5 and 10 percent levels with ***, ** and *, respectively.*

Although significant differences existed between the sample means for the ideal member and the member who contributed the most, are these differences significant within-subjects? Each student's response as to how his or her ideal team member fit a particular attribute and how the member who contributed the most to the project scored on each attribute were tested for any significant differences. There were significant within-subject differences at the .05 level for all attributes except one: *Dependability to show up at meetings*. This is the same attribute where there was no significant difference found between subjects.

The student sample gave significantly lower ratings to those who they perceived to have contributed the *least* along 24 of the 30 attributes. The only attributes where this pattern did not occur are those related to the team member's *Major, Fluency in English, Previous team experience, Friendliness, Personality,* and *Willingness to work weekends*.

When differences within-subjects were tested between ideal team member attributes and those related to the member who contributed the least, the differences on four of the 30 attributes were not significant at the .05 level: *Fluency in English, Desire to voice opinion in group*, *Ability to work late nights with group*, and *Willingness to work weekends*. The ideal team member profile listed the last three attributes as having low mean values.

CONCLUSIONS

This paper presented a peer appraisal process that combines category-based and holistic-based approaches. This peer appraisal process asks students to develop an attribute profile of an ideal team member at the beginning of the project that can be used to provide feedback about the teamwork skills and abilities of students who receive poor and excellent holistic ratings at the end of a project. To test the validity of this method, data were collected in two stages. During the first stage, each student was asked to develop an attribute profile of his or her ideal team member. At the second stage of the process before final project grades were given, students rated their team members along the same attributes as those presented at the start of the project.

The findings suggested that attribute-based profiling could be used to provide feedback to students. The higher ratings that students gave to those that contributed the most to the project compared to the ratings for the ideal member and the lower ratings given to those who contributed the least in most of the attributes attested to the validity of this two-stage appraisal process. The proposed method is user-friendly since it takes advantage of the students' propensity to develop a profile of the ideal team member at the earliest stage of the team project process to complement the more convenient and course grade-friendly holistic-based peer appraisal method at the end of the process.

There are limitations, however, to this method. First, the conceptually defined dimensions and thirty attributes used in this study may not fit other contexts and courses. Second, the method is subject to one of the weakness of any holistic-based approach – it is most useful at distinguishing between poor and excellent performers. It is less robust when assessing average performers whose ratings across attributes may have subtle variations. Third, an appraisal process that allows for open-ended comments about team members may provide richer feedback information. However, this is still subject to the willingness of students to engage in this labor-intensive activity and the instructor's ability to assign a quantitative value to these comments. At the very least, the peer appraisal method proposed in this paper can be used to supplement any comments provided by students and ensures a more comprehensive alternative to a sentence or two about a student's teamwork abilities.

Teamwork is not confined to management education. Future studies could consider the application of this methodology and the peer appraisal process to other disciplines that will allow cross-disciplinary analysis and comparisons.

The relevance of team member attributes such as *friendliness* and *fluency in English* in this peer appraisal method is limited by the context of the study. The students in the sample selected their team members creating team composed of members with a bias in favor of this attributes. Samples that include more diverse groups of students with less experience with each other such as those found in online classes deserves further investigation. The method can also be tested with teams whose members are assigned.

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MBA SHARE IN THE U.S. GRADUATE MANAGEMENT EDUCATION MARKET

Marina Murray, Graduate Management Admission Council (GMAC)

ABSTRACT

The MBA degree has captured public attention since the beginning of the 20th century when MBA programs were first established in the United States. Since then, hardly any master's-level degree created as many media impressions as the MBA. Extensive research has been conducted about MBA students, alumni, and employers, yet, several basic questions remain. How many MBA programs are offered? How many students graduate from these programs? How do these numbers compare with those for other programs in business fields? The U.S. Department of Education (DOE) tracks the number of graduate degrees awarded in business; however, the agency does not delineate which ones are MBA degrees. This paper aims to estimate the MBA share in the U.S. graduate management education market and looks at degree-granting institutions that offer master's-level programs. Based on a sampling from nearly 2,000 institutions, this paper provides an estimate for the number of organizations that offer an MBA degree in the United States. An estimated number of MBA students in a given year and the number of those who graduate with an MBA degree are calculated based on survey data from the Graduate Management Admission Council (GMAC) and the Council of Graduate Schools (CGS) combined with DOE data.

JEL: C13; I23; M1

KEYWORDS: MBA degree, MBA enrollment, MBA students, MBA programs, master-level programs, simple random sample (SRS)

INTRODUCTION

In 1881, Joseph Wharton, a prominent American industrialist who made his fortune in the mining and metallurgical industries, proposed what many in the world of education perceived as a radical idea. He founded the first collegiate business school at the University of Pennsylvania, The Wharton School of Finance and Commerce, which many labeled as a "struggling provincial experiment" ("Hall of Fame," 1998; The Wharton School, 2009). At that time, some argued that business was not a university-level discipline (Schlossman, S., Gleeson, R.E., Sedlak, M., & Grayson Allen, D., 1994). Thirty years later, following the establishment of "the world's first MBA program" (Harvard Business School, 2009) by the Harvard Graduate School of Business Administration and the opening of schools of commerce at other prominent U.S. universities, such as New York University, Dartmouth, University of Chicago, and the State Universities of California, an animated public discussion continued about the value, principles, and place of commercial education in the educational system (Johnson, 1910).

Yet, by the end of the 20th century, Joseph Wharton's "radical idea" had sunk deep roots and spread worldwide. We now have an estimated 300,000 plus students graduating annually from more than 1,000 graduate and undergraduate business programs around the world (The Wharton School, 2009), a vivid testament to the tremendous interest in business credentials, including the MBA. News coverage related to graduate management education has also increased exponentially. In addition to discussion of broad higher education and economic topics connected to the MBA, school and program rankings, including the popular *BusinessWeek* survey that was first released in 1988 and subsequent undertakings by the *Economist*, *Forbes*, the *Financial Times*, *Wall Street Journal*, and *U.S. News & World Report* (Tyson, 2004), have served as catalysts for increased public attention to the MBA.

Public and academic interest inspired numerous studies focusing on MBA curriculum, faculty, students, alumni and employers. Among them are studies conducted by the Association to Advance Collegiate Schools of Business (AACSB), the Association of MBAs (AMBA) and the Graduate Management Admission Council (GMAC), for example. Yet, several basic questions have remained unanswered, including:

- How many MBA programs are offered?
- How many students graduate from these programs?
- How do these numbers compare with those for other programs in business fields?

While limiting the scope of study to U.S. primary providers of postsecondary education that offer degree-granting programs at the master level or above, this paper aims to provide an estimate for the following:

1. Proportion of institutions that offer MBA degrees within 5% of the population percentage with a 95% confidence interval,
2. Number of graduates who are awarded MBA degrees annually, and
3. Number of MBA students enrolled in a given year.

The body of this paper is organized in several sections. Section 2 reviews relevant literature on available data on the number of MBA programs and on the use of simple random sampling techniques to obtain population estimates. Section 3 describes the research methodology, including data sources and estimation procedures used in the study, followed by Section 4, which presents detailed calculations leading to the study's findings. Section 5 presents the author's conclusions regarding the study's findings and discusses the limitations of this research and recommendations for future studies.

LITERATURE REVIEW

This section examines what data is available on the number of MBA programs via business school accrediting bodies as well as looks at the variety of sampling applications for population estimates.

As part of their accreditation process for business schools and graduate management programs, various accreditation agencies regularly perform a thorough enumeration of graduate management programs. The Association to Advance Collegiate Schools of Business (AACSB, 2009) requires accreditation candidates to identify all business degree programs delivered by the institution with subsequent authentication by the chief academic officer. As part of candidate self-study, the Association of Collegiate Business Schools and Programs (ACBSP, 2009) requires review of all business school programs, including those granting associate, bachelor's, and graduate degrees; so too does the International Assembly for Collegiate Business Education (IACB, 2010). The Association of MBAs (AMBA 2007a, 2007b) collects detailed demographic information, including delivery mode and duration, for MBA and Master's in Business and Management programs. The European Foundation for Management Development (EFMD, 2010) also collects program-based information as part of its European Quality Improvement System (EQUIS) accreditation. The data collection that each organization mandates for accreditation purposes yields statistics on the number of programs, students, and degrees conferred; however, it does not go beyond each organization's membership base.

Population sampling and drawing conclusions based on the assessment of a limited part (sample) of a whole—the primary research method used in this study—is a long-established and cost-efficient research tool that saves resources, time and money. Sampling methods of various types thus have been applied extensively and successfully in innumerable research studies in social science and beyond. For example, Köhl, Magnussen and Marchetti (2006) discuss sampling design and simple random sampling in forest surveys for estimating biodiversity, assessing particular phenomena, or calculating wildfire risks.

Robertson, Zlotnich and Westerfelt (1997) estimate drug consumption among homeless adults by sampling sites that have a concentrated homeless population and subsequent sampling of individuals based on their demographics. Snow et al. (2010) use stratified simple random sampling to estimate the prevalence of Salmonella in egg-laying farms in Great Britain. Levy and Lemeshow (1999) cover sampling frames, methods, estimation techniques and sampling errors in their book on survey research.

RESEARCH METHODOLOGY

This section first describes the data sources used in the study, then defines the sampling frame, and last provides detailed calculations used to determine the needed sample size.

Data Sources

This research is based on publicly available institution-level data from the National Center for Education Statistics (NCES), the primary U.S. federal entity for collecting education-related data. The NCES 2007–2008 Institutional Characteristics (IC) survey data used in the calculations are the core component of the Integrated Postsecondary Education Data System (IPEDS) and are collected annually (NCES, 2009). Completion of this survey is mandatory for open-to-public educational institutions that participate in federal student financial aid programs, which comprised of 6,624 schools as of fall 2007. Of the 7,052 postsecondary institutions that NCES surveys, 1,957 offer a graduate degree or certificate. Table 1 shows how the sampling frame for this study was defined based on DOE/NCES IC survey data.

Table 1: Sampling Frame

	Number of Institutions	Percentage of Institutions
Total	7,052	100.0%
Participates in financial aid programs	6,624	93.9%
Degree-granting	4,605	65.3%
Offers graduate degree or certificate	2,005	28.4%
Minus administrative units	48	—
Study population	1,957	27.8%

This table shows how the sampling frame for the study was defined.
Source: DOE/NCES 2007–2008 IC Survey data.

The second major data source used in this study is primary research data collected by the Graduate Management Admission Council through its *Application Trends Survey* (ATS) conducted in 2008 (GMAC, 2008). The sample selection is drawn primarily from schools that use the GMAT exam for admissions. These schools received 42% of GMAT score reports sent during testing year 2008 (which ran from July 2007 to June 2008). For the purposes of this study, only data reported by institutions located in the United States were analyzed.

The third data source consists of statistics taken from the Council of Graduate Schools' (CGS) annual series titled *Graduate Enrollment and Degrees*, conducted from 2005 to 2008. These are based on yearly survey responses from about 700 U.S. colleges and universities that offer graduate programs (Bell, 2009, 2008; Redd, 2007; Brown, 2006). Participating institutions enroll more than 70% of all graduate students in the United States.

The population of schools was adjusted to exclude administrative units such as university system offices, and a simple random sample (SRS) was drawn to identify the proportion of institutions that offer MBA degrees within 5% of the population percentage with a 95% confidence interval.

Estimation Procedures

The size of the population of institutions offering an MBA was determined by extrapolating from a representative sample of all known institutions in the United States. The first task then was to determine the needed sample size.

Given that the universe of graduate degree offering institutions is 1,957, the initial estimated sample size needed to yield a margin of error of ± 2.5%, i.e., the 95% confidence interval is

$$n' = 1.96^2 \frac{P(1-P)}{.05^2}, \tag{1}$$

where n' is an initial estimate of the sample size and *P* is an estimated population proportion.

This equation is a direct algebraic manipulation of the equation for standard error (SE):

$$1.96\,SE = 5\% \;\; and$$

$$SE = \sqrt{\frac{P(1-P)}{n'}} \quad .$$

This initial estimate was then refined by applying the correction for a finite population

$$n = \frac{N * n'}{N + n'}, \tag{2}$$

where N is the population size.

Applying equations 1 and 2, the needed sample size was determined to be 310.

$$n' = 1.96^2 * \frac{.40 * .60}{.05^2} = 369$$
$$n = \frac{1{,}957 * 369}{1{,}957 + 369} = 310 \tag{3}$$

For calculating the sample size, the population proportion of institutions offering MBA degrees was initially assumed to be .40 based on data from three small random samples (n = 10) from the studied population.

Accreditation rosters, websites and the other data files were consulted to determine characteristics of the sampled institutions and to derive estimates for various population parameters.

The MBA and other master-level business degree offerings (such as Master of Accounting, Finance, Management, etc.) were determined in June 2009 based on information posted on institutional websites (98%) or by calling admissions offices (2%) if online information was unavailable or unclear.

Longitudinal statistics on master's degrees conferred by degree-granting institutions from the DOE/NCES Completions Survey were used to estimate the number of business degrees conferred in 2007–2008 by

applying a three-year average percentage change to the actual number of degrees conferred in the preceding period. Student attrition rates in MBA programs were assumed to be similar to those in other master-level business programs.

Longitudinal statistics from CGS on the number of graduate students in business fields enrolled and the number of graduate business degrees awarded were used to estimate the award-to-enrollments ratio for graduate business programs. An average percentage based on the latest three-year period was used in calculations.

RESULTS

Findings presented in this section correspond to the order of the three primary research questions posed in this study: (1) an estimation of the number of US institutions offering MBA degrees, (2) a calculation of the number of graduates awarded an MBA degree, and (3) the number of MBA students enrolled in a given year.

Proportion of Institutions Offering MBA Degrees

The 310-institution sample was representative of the studied population in terms of size, regional location, degree of area urbanization, and control of the institution—variables that may affect the number and type of degree offerings (Table 2).

Table 2: Selected Characteristics of the Population and Sample

	Population (n=1,957)	Sample (n=310)
Institution Size Category		
Under 1,000 students	31.4%	31.9%
1,000–4,999 students	38.4%	36.8%
5,000–9,999 students	13.0%	14.5%
10,000–19,999 students	9.6%	9.0%
20,000 and above	6.8%	7.4%
N/A	0.8%	0.3%
Total	100.0%	100.0%
Geographic Region		
U.S. Service Schools	0.2%	—
New England	7.7%	6.8%
Mid East	19.5%	21.0%
Great Lakes	15.9%	13.9%
Plains	9.4%	8.4%
Southeast	20.8%	21.9%
Southwest	8.2%	6.5%
Rocky Mountains	3.1%	4.5%
Far West	13.3%	14.5%
Outlying areas	2.0%	2.6%
Total	100.0%	100.0%
Degree of Urbanization		
City	54.9%	56.1%
Suburb	23.6%	22.3%
Town	13.4%	13.2%
Rural	8.0%	7.7%
N/A	0.1%	0.6%
Total	100.0%	100.0%
Control of Institution		
Public	28.1%	27.1%
Private not-for-profit	60.8%	62.3%
Private for-profit	11.1%	10.6%
Total	100.0%	100.0%

This table compares the population and the sample based on four variables that may influence degree offerings: institution size, geographic region, degree of urbanization, an institutional control.
Source: DOE/ NCES 2007–08 IC Survey data.

Of 310 examined institutions, 180, or 58.1%, offered master-level degrees in business fields, including an MBA, and 154, or 49.7%, offered an MBA degree. Notably, all institutions that offered an MBA degree also offered at least 1 other graduate business degree; and 26 institutions offered only master-level degrees in business other than MBA.

Number of Graduates Awarded MBA Degrees

Applying sample percentages to the population of 1,957 institutions, we estimate that 1,136 schools (1,957*0.581) offer graduate degrees in business, including MBAs; 972 institutions (1,957*0.497) offer an MBA degree; 164 (1,136 - 972) offer other master-level degrees in business, but not an MBA; and 821 (1,957 – 1,136) focus on disciplines other than business. Thus, in 2008, an estimated 1,136 schools awarded all graduate business degrees in the United States.

As Table 3 shows, the number of business degrees conferred by degree-granting institutions in the United States in 2007–2008 was estimated at 160,529 by consecutively applying a three-year average percentage change to the latest available 2005–2006 DOE data.

Table 3: Master's Degrees in Business Conferred by Degree-Granting Institutions, 2001–2002 to 2007–2008

	01–02	02–03	03–04	04–05	05–06	06–07 (est.)	07–08 (est.)
Number	119,725	127,685	139,347	142,617	146,406	153,305	160,529
Annual % change	3.6%	6.6%	9.1%	2.3%	2.7%	4.7% (est.)	4.7% (est.)
3-year % change	3.7%	4.6%	6.4%	6.0%	4.7%	—	—

This table shows how the number of master's degrees in business conferred in 2007–2008 was estimated.
Source: DOE/NCES 2007–2008 Completions Survey, Fall 2000 through Fall 2006, Table 262.

According to the GMAC 2008 ATS data reported by 181 institutions in the United States that offered graduate management programs, U.S. schools offered an average of 4.38 business degree programs per school (Murray, 2008). Unlike the population of all U.S. schools that offered master-level degrees or above, however, all 181 institutions that reported to the survey offered an MBA degree. Table 4 shows that, with all program types (e.g., full-time, part-time) combined, an average 2007–2008 MBA class consisted of 104.8 students, and, with all majors combined, an average class of other master's programs specialized in business fields consisted of 50.8 students. Assuming that the student attrition rate is similar for MBA and other master's programs in business, we may expect that the MBA/master's student ratio of 2.06:1 will translate into the same ratio among those who successfully graduated from the program. Therefore, if an average institution that offers an MBA program grants x master's degrees in business other than MBA, it would award $2.06\,x$ MBA degrees. Consequently, an estimated 972 institutions awarded a total of $972*(x + 2.06\,x)$ or $2{,}974\,x$ degrees to students from 1 MBA and 3.38 (4.38 - 1) master-level programs at each institution, on average.

Table 4: Number of Graduate Business Degrees Offered and Average Class Size, by Institution Size

Institution Size	Mean Number of Degrees	Mean MBA Class Size	Mean Master's Class Size	Ratio (MBA/Master's)
Under 1,000 students	1.00	48.0	35.0	1.37
1,000–4,999 students	2.68	82.4	20.5	4.02
5,000–9,999 students	3.81	68.4	40.1	1.71
10,000–19,999 students	4.42	128.4	33.3	3.85
20,000 and above	5.43	129.6	61.6	2.10
Total	4.38	104.8	50.8	2.06

This table shows that a strong correlation exists between the institution size and the number of degrees offered and provides the average absolute and relative (MBA/master's student ratio derived based on the average class size) class size for an MBA program and a master-level program.
Source: GMAC 2008 ATS data.

As observed among schools that offered MBA degrees (Table 4), there is reason to believe that a strong correlation also will exist between the size of the institution and the number of graduate business degrees offered among the estimated 164 institutions that only offered other graduate degrees in business fields. Based on the characteristics of schools in the sample, the majority of those that offered only other master's degrees in business (61.6%) were at institutions with fewer than 5,000 students, as displayed in Table 5. GMAC survey results highlighted in Table 4 showed that similar schools that offered MBA degrees had an average of 1 to 2.68 degree programs, including the MBA. Thus, using a conservative approach, we may assume that 164 institutions offered on average one master-level program in business.

Table 5: Selected Characteristics of Sampled Institutions and 2008 ATS Respondents

	Sampled with MBA (n=154)	Sampled with Master's (n=26)	ATS Respondents (n=180)
Institution Size Category			
Under 1,000 students	11.7%	23.1%	1.1%
1,000–4,999 students	40.3%	38.5%	15.5%
5,000–9,999 students	20.8%	23.1%	17.7%
10,000–19,999 students	13.6%	11.5%	26.0%
20,000 and above	13.6%	3.8%	39.2%
N/A	—	—	0.6%
Total	100.0%	100.0%	100.0%
Geographic Region			
U.S. Service Schools	—	—	—
New England	6.5%	7.7%	11.0%
Mid East	17.5%	30.8%	15.5%
Great Lakes	10.4%	11.5%	16.0%
Plains	10.4%	3.8%	5.0%
Southeast	25.3%	26.9%	23.8%
Southwest	5.8%	3.8%	11.0%
Rocky Mountains	5.2%	7.7%	3.9%
Far West	14.9%	3.8%	13.3%
Outlying areas	3.9%	3.8%	0.6%
Total	100.0%	100.0%	100.0%
Degree of Urbanization			
City	54.5%	61.5%	64.1%
Suburb	24.7%	15.4%	24.3%
Town	13.0%	23.1%	8.3%
Rural	6.5%	—	2.8%
N/A	1.3%	—	0.6%
Total	100.0%	100.0%	100.0%
Control of Institution			
Public	33.8%	38.5%	53.6%
Private not-for-profit	52.6%	53.8%	45.9%
Private for-profit	13.6%	7.7%	0.6%
Total	100.0%	100.0%	100.0%

This table compares characteristics of institutions in the 310-unit sample that offer MBA degrees or only other master's degrees, and characteristics of institutions that reported to the GMAC 2008 Application Trends Survey (annual survey of graduate management programs that tracks application volume, acceptance and enrollment rates, and incoming class size), based on four variables.
Source: DOE/ NCES 2007–2008 IC Survey data and GMAC 2008 ATS data.

If 3.38 degree programs per school (4.38 - 1) awarded x master's degrees other than MBA, one program would award $x/3.38$ degrees, on average, and 164 institutions would award $164*(x/3.38)$ or $48.52x$ degrees. Therefore, solving the following equation would provide an estimate of an average number of MBA ($2.06x$) and other master's degrees in business (x) awarded per institution.

$$972*(x+2.06x)+164*\frac{x}{3.38}=160{,}529$$

$$x=53.11 \qquad (3)$$

$$2.06x=109.41$$

Multiplying the average number of MBA degrees offered by the number of institutions that grant these degrees (109.41*972), we can estimate that of all graduate business degrees awarded in 2007–2008 (160,529), 106,347 or 66% were MBA degrees.

Because institutions that reported to the GMAC *Application Trends Survey* were significantly different from the randomly selected schools offering MBA programs in terms of student body size with over-representation of larger organizations (Table 5), we may need to adjust calculations using a separate ratio of MBA to master's programs within each size group (Table 4). To identify the size of each group in the population, sample percentages of size distribution (Table 5) were applied to 972 schools that offered an MBA degree, as displayed in Table 6.

Table 6: Number of Institutions Offering MBA Degree and MBA/Master's Ratio, by Size

Institution Size	Institutions with MBA	Ratio (MBA/Masters)
Under 1,000 students	114	1.37
1,000–4,999 students	392	4.02
5,000–9,999 students	202	1.71
10,000–19,999 students	132	3.85
20,000 and above	132	2.10
Total	972	2.06

This table shows the number of institutions that offer an MBA degree by size category and provides MBA/master's program class-size ratio also found in Table 4.Source: DOE/ NCES 2007–2008 IC Survey data and GMAC 2008 ATS data.

Now, the first portion of the equation (3) will consist of five parts derived for each size subgroup starting from the smallest institutions likely to offer only one MBA program ($114*1.37\,x$) to the largest ($132*(x + 2.10\,x)$). Solving this equation, the adjusted-for-size number of other master's degrees in business awarded per institution $x = 42.59$, and the total estimated number of MBA degrees awarded in 2007–2008 was 121,968 or 76% of all graduate business degrees conferred.

Based on different approaches to calculating the number of MBA degrees, the two estimates—66% and 76%—can be viewed as low and high alternatives that assume the range of outcomes where the actual population percentage may be. Because the 2:1 MBA/master's ratio represents a conservative approach, it is reasonable to conclude that at least 66% of graduate business degrees conferred in the United States in 2007–2008 were MBA degrees.

Number of MBA Students Enrolled in a Given Year

The number of graduate students enrolled in business fields (which include Business Administration and Management, Accounting, and Banking and Finance), as well as the number of graduate certificates and degrees awarded reported annually to CGS by the same institutions may serve as a basis for deriving the proportion of total enrolled students who also successfully received their diplomas. As shown in Table 7, the number of MBA students enrolled in a given year, including first-time and continuing students, can be estimated by applying the percentage of awards in enrollments to the estimated number of MBA degrees conferred. We applied a 2006–2008 three-year average percentage (39.1%), derived from institutions reporting to CGS for graduate business fields, to the conservative estimate of the number of MBA degrees awarded in 2008 (106,347). From this calculation, we estimate that 272,219 students may be enrolled in MBA programs annually.

Table 7: Graduate Enrollment and Degrees Conferred, Business and All Fields Combined, in Thousands

	04–05	05–06	06–07	07–08
Business (Source: CGS)				
Students enrolled	219.953	220.682	188.823	255.215
Degrees awarded	82.832	86.575	73.982	98.935
Percentage of enrolled	37.7%	39.2%	39.2%	38.8%
All fields combined (Source: DOE)				
Students enrolled	2,186	2,231	2,294	2,339*
Degrees awarded	627.249	650.132	665.223	681.800*
Percentage of enrolled	28.7%	29.1%	29.0%	29.1%

This table shows the percentage of graduate degrees awarded based on the total number of graduate students enrolled overall and in business fields each year. Projected. Source: CGS 2006–2009, DOE/NCES (Hussar & Bailey, 2009).*

Notably, a consistent 10 percentage-point difference exists between CGS statistics on business degree awards as percentage of enrollments and similar DOE statistics that cover all graduate fields at all U.S. degree-granting institutions (Table 7). It appears unlikely that in the population, business programs have higher graduation rates than nonbusiness programs. The observed difference possibly can be attributed to specifics of the CGS sample, which primarily consists of CGS member schools. (CGS member schools tend to be larger institutions with accredited programs in several distinct disciplines, which are likely to graduate more students.) Thus, applying a three-year average percentage derived from all graduate schools' data (29.1%) to the conservative estimate of the number of MBA degrees awarded (106,347), yields a high alternative of 365,502 students that may be enrolled in MBA programs. The range of 272,219 to 365,502 potential students enrolled also includes 312,205 enrollments that are calculated by applying a percentage of business awards to enrollments (39.1%) to the high alternative estimate of MBA degrees awarded (121,968). Accordingly, at least 272,219 first-time enrolled and continuing students were in MBA programs in the United States in 2008 (Table 8).

Table 8: Summary of Results

	Number	Percentage
Institutions		
Offers graduate degrees	1,957	100.0%
Offers graduate degrees in business	1,136	58.1%
Offers MBA degrees	972	49.7%
Students		
Master's degrees in business conferred	160,529	100.0%
MBA degrees conferred—Low alternative	106,347	66.2%
MBA degrees conferred—High alternative	121,968	76.0%
MBA students enrolled—Low alternative	272,219	—
MBA students enrolled—High alternative	365,502	—

This table summarizes results of the calculations presented in the paper.

CONCLUSION

The findings presented in this paper provide estimates of the MBA share in the U.S. graduate management education market in terms of the proportion of institutions offering MBA degrees and the proportion of MBA degrees among all graduate business degrees conferred. The study relies primarily on population estimation principles based on sampling data and uses government statistics and primary research data for derivative calculations. The study results show that half of U.S. educational institutions that offered master-level degrees (49.7%)—one-fifth of all 4,605 degree-granting institutions in the United States (21.1%)—offered an MBA degree. These schools enrolled more than a quarter of a million students in MBA programs and awarded more than 100,000 MBA degrees annually, which was at least 66% of all graduate business degrees conferred in the United States in 2008. The findings may be helpful in defining sampling frames for MBA-related research and providing a broader context for evaluating conclusions of existing research.

This study has several limitations, including the use of assumptions based on logic or common sense rather than existing research and the use of survey data that are a subject to sampling error and nonresponse error. In addition, this paper combined data for calculations from several different sources with timelines and samples that may not coincide precisely. A simplified approach based on three-year averages instead of comprehensive mathematical models was used to extrapolate trends from preceding periods to future periods. Overcoming the study's limitations may be a subject for future research.

In addition, examining how well the findings hold using more recent data from DOE, CGS and GMAC, expanding the scope of research to other world regions and providing international estimates may be a readily achievable opportunity for future research.

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STUDENT ETHICAL AWARENESS AND BUSINESS PROGRAM MATRICULATION: EVIDENCE FROM THE U.S.

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ABSTRACT

An ethics survey of business students was conducted over a five semester period in a variety of business courses at a regional state university in the Midwest. The business program has adopted an across the curriculum approach to ethical instruction, and has also mandated a one-semester ethics course for all business majors. The purpose of the study was to prove or disprove the hypothesis that students completing the courses required by the business curriculum show a measurable increase in ethical awareness. The results of the survey revealed no significant correlation between class level (i.e. sophomore, junior, senior) and increased ethical awareness, and the completion of the ethics course only increased ethical awareness for individual (non-business) situations. However, a positive correlation between ethical awareness and two other factors was revealed: Both females and students with higher GPA's appear to be more ethically aware than the general population.

JEL: I21

KEYWORDS: Ordered logit model, student ethical awareness

INTRODUCTION

The past decade has witnessed several high profile business scandals in the U.S., from Enron to the more recent Goldman Sachs and Bernie Madoff cases. The associated institutional breakdown of trust in business has led many to question whether corporate officers and boards of directors are losing legitimacy (Khurana and Nohria, 2008; Molyneaux, 2004). In response, specific organizations and society as a whole have come to recognize that ethical and socially responsible behavior plays a crucial role in good business practices (Nicholson and DeMoss, 2009).

There is a long standing controversy over whether business ethics can be taught, and if so, what methodology is most suitable to the task. Some argue that, desirable as sound business ethics may be, it simply can't be taught in the classroom (Stape, 2002). Business ethics has been caustically referred to as being an oxymoron (Townley, 1992) and, during the 1970's and 1980's, writers as influential as Peter Drucker and Milton Friedman argued that it cannot be taught at all (Nguyen *et. al*., 2008).

A study measuring attitudes towards unethical behavior, love of money, Machiavellianism, and risk tolerance identifies business students as being more likely to engage in unethical behavior than psychology students (Tang *et al.,* 2008). The authors state that corruption and scandals are caused, not by lack of intelligence, but by lack of wisdom or virtue. They also argue that social institutions, as well as business schools, CEO's, corporate culture, and compensation systems have significant impacts on managers' ethical behavior. This corroborates earlier studies which suggest that organizational culture and other organizational factors which occur after formal education play a major role in shaping the way individuals perceive moral responsibility (Frederick and Weber, 1987; Kelley *et al*., 1989). Similarly, Awasthi (2008) conducted a study which revealed that exposing students to a business ethics course

influenced their managerial judgment and managerial intent, but did not directly influence moral judgment. However, the literature casting doubt on the efficacy of teaching business ethics does not recommend abandonment of the discipline, nor does it condemn it as useless. For example, Tang *et al.* (2008) recommend that schools, organizations, and society as a whole need to work together to promote ethical behavior.

The purpose of this study is to determine whether undergraduate business students demonstrate an increase in ethical awareness as they progress through the program and complete a required course in business ethics. The study was conducted over a five semester period from spring 2008 through spring 2010 at a regional state university in the Midwest, with students sampled from courses in accounting, economics, finance, and entrepreneurship. In addition to requiring a one-semester business ethics course, the business program has adopted an across the curriculum approach to ethical instruction.

The paper is organized as follows: Section 2 provides a literature review, section 3 presents the data and methodology, section 4 discusses the empirical results, and the conclusion is presented in section 5.

LITERATURE REVIEW

There is a body of literature indicating a positive correlation between teaching business ethics and changing student awareness of ethics in business. A study examining undergraduate student learning in business ethics, particularly ethical judgment, indicated that the more students learn about contractualism ethics the less likely they are to engage in unethical behavior (Nguyen *et. al*., 2008). Research also suggests that moral development continues during the college experience and that knowledge gained during this experience has a positive correlation to moral development (King and Mayhew, 2002; Williams and Dewett, 2005). In addition, while commenting on Williams and Dewitt's work as part of their own study, Cox *et. al*. (2009) state that their review of the business ethics literature indicates "business ethics education can be effective in increasing students' awareness of moral issues, promoting students' moral development, and promoting students' ability to handle complex ethical decision making."

In a work devoted to the subject of teaching ethics, Gilbert (1992) stated that exposure to business ethics is necessary in order to increase student's awareness of the ethical components of business situations as well as to improve their ethical reasoning. Klugman and Stump (2006) posit that teaching ethics enhances student's critical reasoning and therefore makes them better able to effectively deal with ethical dilemmas. Langan (1990) went so far as to state that exposure to business ethics courses prepares students to face ethical dilemmas in the workplace by broadening their knowledge base relative to business ethics, which in turn increases their analytical reasoning skills.

A study involving undergraduate students demonstrated that the more students learn about ethics the less likely they are to report that they would engage in unethical behaviors as depicted in scenarios presented to them (Nguyen *et al*., 2008). Furthermore, research supports a link between changing ethical mores and educational accomplishments (Gundersen *et al.,* 2008). As individuals progress through different levels of cognitive moral development, their ability to deal with ethical dilemmas improves (Christensen and Kohls, 2003; Goolsby and Hunt, 1992; Kohlberg, 1969). As a result, a pattern of increasing ethical standards should develop as individual's progress educationally (Gundersen *et al.,* 2008). Research has also linked business ethics education with changing student attitudes towards ethics in general, as well as with improving their understanding of the complexity of ethical decision making (MacFarlane, 2001).

It is generally agreed that ethics can and should be taught across the curriculum, and many believe such across the curriculum programs to be effective in developing student's moral standards (Gundersen *et al., 2008)*. However, as described by Cox *et al.* (2009), much of the support is based on anecdotal evidence.

Furthermore, several studies cast doubt on the effectiveness of ethics instruction (Cole and Smith, 1995; Wynd and Maget, 1989).

There are various rationales advanced for the belief that ethics cannot, or should not, be taught in schools of higher education. Kultgen (1988) suggests that efforts at ethical instruction are better left to institutions outside higher education. He suggests that the family or religious institutions are more adept at ethical instruction and the development of individual moral values. Others, like McDonald and Donleavy (1995) and Bishop (1992), suggest that many schools give only lip service to the teaching of ethics because they have adopted such programs for appearances sake only. They conclude that such programs are therefore ineffective. This study attempts to further clarify the link between ethics instruction in higher education and student awareness of ethical issues.

DATA AND METHODOLOGY

The data for this study originated from a classroom survey taken by students attending a regional state university. The survey was conducted in undergraduate classes that were either held face-to-face or delivered via the internet during the semesters of spring 2008, fall 2008, spring 2009, fall 2009, and spring 2010. Students completing the survey were business and non-business majors taking courses in accounting, economics, finance, or entrepreneurship as part of the general education requirement, business core, or business specialization.

The survey respondents were asked questions concerning gender, year in college, cumulative grade point average, major, and completion of the business ethics course. The questionnaire also measured ethical awareness associated with both personal and business situations. Table 1 provides the list of questions as well as sample statistics for each question, and Table 2 reveals the correlations between questions.

Table 1: Survey Summary Statistics (*N*=410)

Variable	Description	Distribution*
Individual Situations		
Q1	In preparing your income taxes, you claim charitable deductions that are not valid.	1-3.90%; 2-4.63%; 3-7.80%; 4-24.63%; 5-59.02%
Q2	You use your computer at work for personal reasons such as shopping online.	1-7.07%; 2-19.76%; 3-21.95%; 4-30.00%; 5-21.22%
Q3	You tell a potential buyer of your used car that it gets 30 mpg, but in reality the car gets less than 25 mpg.	1-4.15%; 2-7.32%; 3-7.32%; 4-35.12%; 5-46.10%
Q4	You download music for free off the internet.	1-11.22%; 2-18.29%; 3-20.24%; 4-28.54%; 5-21.71%
Q5	You give a store clerk $20 to change and she gives you change for $30 and you keep the extra money.	1-6.34%; 2-6.34%; 3-7.80%; 4-23.66%; 5-55.85%
QIS	Sum of Q1 through Q5	Mean = 19.28, Std. dev. = 0.28
Business Situation		
Q6	A job candidate was rated poorly and would never be considered for a position with your company but you tell her that you will hang onto her resume and consider her for future job openings.	1-10.49%; 2-30.98%; 3-26.83%; 4-20.73%; 5-10.98%
Q7	You smell alcohol on a valuable employee's breath after his lunch hour. Company policy requires termination for drinking on the job. Instead, you give him a verbal warning and tell him never to get caught again.	1-5.12%; 2-15.12%; 3-21.46%; 4-34.15%; 5-24.15%
Q8	You fill a job in your department with someone you personally pick rather than posting the position for all employees to see.	1-5.37%; 2-11.95%; 3-24.63%; 4-30.00%; 5-28.05%
Q9	You make copies of copyrighted materials and distribute them in a business meeting.	1-5.37%; 2-10.00%; 3-24.88%; 4-27.56%; 5-32.20%
Q10	Your boss calls from out of town and instructs you to forge his signature on a purchase order and bring it to the purchasing manager for processing.	1-7.07%; 2-18.05%; 3-23.41%; 4-23.66%; 5-27.80%
QBS	Sum of Q6 through Q10	Mean = 17.30; Std. dev = 3.89
QTS	Sum of QIS and QBS	Mean = 36.58; Std. dev = 7.26

This table shows the description of each of the questions contained in the survey and the distribution of the responses to each of the questions.
**Coding applied to all survey questions is as follows: 1–Definitely not an ethical issue; 2–Probably not; 3–Maybe (not sure); 4–Probably; 5–Definitely an ethical issue.*

Table 2: Spearman Rank Correlation Matrix

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1	1.00									
Q2	0.39	1.00								
Q3	0.57	0.38	1.00							
Q4	0.24	0.35	0.36	1.00						
Q5	0.53	0.39	0.59	0.36	1.00					
Q6	0.17	0.21	0.27	0.31	0.27	1.00				
Q7	0.24	0.32	0.24	0.25	0.31	0.30	1.00			
Q8	0.27	0.30	0.31	0.25	0.39	0.26	0.30	1.00		
Q9	0.40	0.36	0.39	0.34	0.35	0.27	0.30	0.39	1.00	
Q10	0.21	0.23	0.18	0.20	0.22	0.17	0.29	0.22	0.36	1.00

This table shows the correlation between any two questions contained in the survey. The closer the number to 1 the more correlation between the two questions.

Table 3 summarizes the characteristics of the respondents. The explanatory variables include the student's class level (Year), cumulative grade point average (GPA), whether or not the students major is business (Business), gender (Gender), and whether or not students have completed the Business Ethics class (Ethic). In total 436 students were surveyed, 410 of which produced valid questionnaires. The majority of the respondents were majors in business (approximately 73 percent), and nearly three-quarters were in their junior or senior year. As business ethics was only recently added as a requirement in the college, only 13% had completed this course at the time of the survey.

Table 3: Demographic Summary Statistics (*N*=410)

Variable	Description	Distribution (%)	Coding
Year	1. Freshman	9.02	As described
	2. Sophomore	17.07	
	3. Junior	35.12	
	4. Senior	38.54	
GPA	Cumulative Grade Point Average		As described Mean = 2.96 Std. dev. = 0.47
Business	0 if non-business major	27.07	
	1 if business major	72.93	
Gender	0 if female	47.80	As described
	1 if male	52.20	
Ethic	0 if not taken Business Ethics Class	86.83	
	1 if completed Business Ethics Class	12.93	

This table shows the demographic statistics of the respondents whose completed surveys are utilized in the study.

Given the discrete, ordered, and multinomial nature of the survey data, the responses of the ethical awareness survey were modeled using an ordered logit model. It is assumed that the error term, ε_i, follows a logistic distribution. The assumption that the ε_i are normally distributed would result in an ordered probit model. Further, the model was used to evaluate the factors that influence the degree of ethical awareness which may be modeled as a linear function of the observable explanatory variables, x_i, and unobservable factors, ε_i, according to Greene (2003) as

$$y^* = x_i\beta_i + \varepsilon_i \quad (1)$$

where y^* is a continuous latent variable which is not observable, given that the respondents are only provided with j possible choices and will choose the one that best reflects the degree of their ethical awareness regarding the respective situation. The respondent's ethical awareness concerning each situation can be segregated into thresholds α_j, where $j = \{1, 2, 3, 4, 5\}$. Each student ranked his/her ethical awareness by classifying their response to each situation as definitely not an ethical issue,

probably not an ethical issue, maybe an ethic issue, probably an ethical issue, and definitely an ethical issue. Hence, we observe:

$$\begin{aligned}
&y_i = 1 \text{ (definitely not an ethical issue)} && \text{if } y_i^* \le \alpha_1 = 1 \\
&y_i = 2 \text{ (probably not an ethical issue)} && \text{if } \alpha_1 < y_i^* \le \alpha_2 \\
&y_i = 3 \text{ (maybe an ethical issue)} && \text{if } \alpha_2 < y_i^* \le \alpha_3 \\
&y_i = 4 \text{ (probably an ethical issue)} && \text{if } \alpha_3 < y_i^* \le \alpha_4 \\
&y_i = 5 \text{ (definitely an ethical issue)} && \text{if } \alpha_4 < y_i^* \le \alpha_5
\end{aligned} \qquad (2)$$

where the unknown α_js are estimated along with the βs. The α_js are restricted such that $\alpha_1 < \alpha_2 < \alpha_3 < \alpha_4 < \alpha_5$, which is required for positive probability estimates. If the error term, ε_i, is assumed to be logistically distributed, the probabilities that the students rank the degree of ethical issue are given as:

$$Pr_{ij} = Prob\langle y_i = j | x_i \rangle = F\left(\alpha_j - x_i\beta\right) - F\left(\alpha_{j-1} - x_i\beta\right) \qquad (3)$$

where i = 1 to 410 and j = 1 to 5. $F(\cdot)$ is defined as a cumulative logistic distribution function with mean zero and standard deviation $\sigma = \pi/\sqrt{3}$. The maximum likelihood parameter estimates (MLEs) are obtained by maximizing the log likelihood function with respect to β and α,

$$L(\beta, \alpha) = \sum_{i=1}^{I} \sum_{j=1}^{J} \delta_{ij} ln\left(Pr_{ij}\right) \qquad (4)$$

where δ_{ij} is an indicator variable equal to one if student i ranks the degree of j, and zero otherwise. Further, the constant term in the linear regression model is set to zero without any loss of generality in the estimation. As is the case with binary models, the marginal effects of the exogenous variables on the probabilities are not equal to the coefficients, thus only the signs are unambiguous. Accordingly, the marginal effects are computed by taking the first derivative of the probabilities in equation (3) with respect to x_i.

DISCUSSION AND EVALUATION

The results of the ordered logit model are analyzed in terms of the overall significance of the model and the influence of each explanatory variable on ethical awareness. Table 4 presents the estimated ordered logit model for the degree of ethical awareness of the five predetermined scales. *QIS* in column 2 represents the cumulative scales of ethical awareness for each individual situation. *QBS* in column 3 represents the cumulative scales of ethical awareness for each business situation, and *QTS* in column 4 represents the cumulative scales of ethical awareness for both individual and business situations.

For the estimations of all three situations, *QIS*, *QBS*, and *QTS*, the Likelihood Ratio tests show the regression models are highly significant, with the significance of the Chi-square statistics at the one percent level or higher. The results indicate that the explanatory variables are significantly related to the dependent variables in all three situations.

For the ethical awareness estimate of individual situations, the variable representing the cumulative grade point average of respondents (*GPA*) is positive and significant ($p < 0.01$), thus suggesting that students who perform better in academics have more awareness of the given individual situation. The variable *Gender*, which is a binary variable with 1 indicating male and 0 for female, is negative and significant ($p < 0.05$), implying that female respondents have relatively more ethical awareness toward the individual situations. The positive and significant coefficient of *Ethic* ($p < 0.1$) suggests that students who have taken the Business Ethics class are more ethically aware with regard to individual situations.

For the ethical awareness estimate of business situations, only the *Gender* variable is significant at the 10 percent level or better. As is the case with individual situations, female respondents are relatively more aware of possible ethical issues in the given business situation. For the ethical awareness estimate of the two situations combined, both *GPA* and *Gender* are statistically significant at the one percent level or better. Similar to the estimates for individual situations, both cumulative grade point average and gender have a positive influence on over all ethical awareness.

Table 4: Ordered Logit Model: Explanatory Variables Coefficient Values

Explanatory variables	QIS	QBS	QTS
Year	0.08 (0.10)	-0.05 (0.10)	0.02 (0.10)
GPA	0.94 (0.22)[a]	0.33 (0.21)	0.70 (0.22)[a]
Business	-0.001 (0.20)	0.01 (0.21)	0.03 (0.21)
Gender	-0.45 (0.19)[b]	-0.66 (0.20)[a]	-0.65 (0.20)[a]
Ethic	0.43 (0.25)[c]	0.16 (0.25)	0.37 (0.25)
Log likelihood	-1088.39	-1103.70	-1320.03
LR test	42.70	20.62	35.78
Pseudo-R^2	0.10	0.05	0.08

This table shows the results of the ordered logit model with three general situations as explanatory variables, including individual situation, business situation, and the two situations combined. Standard errors are in parentheses where [a] indicates significant at 1%; [b] indicates significant at 5%; and [c] indicates significant at 10%.

The marginal effects of the explanatory variables that are statistically significant to the probability of observing a positive ethical attitude are reported in Table 5. In an ordered logit model, a unit change in the explanatory variable will have marginal effects on each situation of the ethical awareness scales. For example, the marginal effect of a variable with a positive sign would imply a shift in the probability distribution of the scale variable to the right, i.e. toward a more positive view of an ethical issue, but the marginal effect on each situation will be different in magnitude and direction. For instance, the *GPA* variable has a marginal effect of 0.05 for individual situations and 0.08 for the combined situations. Therefore, students with a higher GPA are 5 percent more ethically aware of individual situations and 8 percent more ethically aware of both individual and business situations.

Table 5: Marginal Effects of Significant Variables at Means

Explanatory variables	QIS	QBS	QTS
GPA	0.05		0.08
Gender	-0.02	-0.16	-0.08
Ethic	0.02		

This table shows the marginal effects of the explanatory variables that are statistically significant to the probability of observing a positive ethical attitude from the estimation presented in Table 4.

The marginal effects of female respondents on the ethical awareness scale are 2 percent, 16 percent, and 8 percent higher than male respondents for individual, business, and combined situations, respectively. Students who have taken the Business Ethics class are 2 percent more ethically aware on individual situations than those who have not taken the class.

Table 6 presents the estimated ordered logit model for the degree of ethical awareness for each of the ten situations, and Table 7 presents the corresponding marginal effects of the significant explanatory variables. Students who are at higher year in college are more ethically aware of situation 1 (*Q1*), while students who are at a lower year in college are more ethical aware of situation 6 (*Q6*). Further, students who maintain a higher cumulative grade point average tend to be more concerned with ethical issues in all situations except situations 6 (*Q6*), 7 (*Q7*), and 10 (*Q10*). Students who major in business are less

ethically aware in situation 6 *(Q6*), but more ethically aware in situation 10 (*Q10*). Female students are more likely concerned with an ethical issue in situations 2 (*Q2*), 4 (*Q4*), 6 (*Q6*), 7 (*Q7*), and 8 (*Q8*).

Table 6: Ordered Logit Model: Explanatory Variables Coefficient Values

Explanatory variables	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Year	0.21	0.11	0.04	-0.04	0.01	-0.29	0.15	-0.07	-0.08	0.15
	(0.10)[b]	(0.09)	(0.10)	(0.09)	(0.10)	(0.10)[a]	(0.09)	(0.10)	(0.10)	(0.09)
GPA	1.33	0.68	0.62	0.59	0.41	0.18	-0.17	0.35	0.59	0.05
	(0.25)[a]	(0.20)[a]	(0.22)[a]	(0.21)[a]	(0.21)[c]	(0.20)	(0.19)	(0.21)[c]	(0.20)[a]	(0.20)
Business	0.05	0.24	-0.34	0.29	-0.12	-0.37	-0.09	-0.22	0.18	0.46
	(0.23)	(0.20)	(0.22)	(0.20)	(0.22)	(0.20)[c]	(0.20)	(0.20)	(0.21)	(0.21)[c]
Gender	0.18	-0.40	-0.01	-0.75	-0.27	-0.38	-0.61	-0.39	-0.24	-0.28
	(0.21)	(0.18)[b]	(0.20)	(0.19)[a]	(0.20)	(0.19)[b]	(0.19)[a]	(0.19)[b]	(0.19)	(0.18)
Ethic	0.34	0.38	0.04	0.32	0.21	0.18	0.02	0.10	0.16	0.05
	(0.35)	(0.28)	(0.27)	(0.28)	(0.27)	(0.26)	(0.24)	(0.24)	(0.25)	(0.28)
Log likelihood	-439.28	-613.88	-500.89	-625.55	-494.11	-614.70	-599.12	-598.35	-589.01	-622.22
LR test	43.37	27.45	14.32	35.45	8.24	18.00	13.87	11.75	13.77	11.73
Pseudo-R^2	0.10	0.07	0.03	0.08	0.02	0.04	0.03	0.03	0.03	0.03

This table shows the results of the ordered logit model with all ten survey questions as explanatory variables. Standard deviations are in parentheses, where [a] indicates significant at 1%; [b] indicates significant at 5%; and [c] indicates significant at 10% .

Table 7: Marginal Effects of Significant Variables at Means

Explanatory variables	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Year	0.002					-0.06				
GPA	0.01	0.05	0.08	0.09	0.08			0.08	0.09	
Business						-0.08				0.10
Gender		-0.03		-0.11		-0.08	-0.15	-0.09		
Ethic										

This table shows the marginal effects of the explanatory variables that are statistically significant to the probability of observing a positive ethical attitude from the estimation presented in Table 6.

SUMMARY AND CONCLUSION

The objective of the study was to test the hypothesis that students completing required business courses have higher ethical awareness. The data used to test the hypothesis was obtained from surveys that asked students to rank the degree to which they believed an ethical issue was associated with a particular situation. The responses were then analyzed using an ordered logit model to determine what variables significantly affect student ethical awareness.

There is modest support that students who have completed an ethics course are more ethically aware. However, the completion of the ethics course only significantly affects ethical awareness as measured by the questions relating to individual situations, and not for those relating to business situations. Furthermore, there appears to be no correlation between class level and ethical awareness. Thus, student understanding of ethical awareness does not significantly improve as they progress toward graduation. However, the study reveals that students who perform better academically, as evidenced by a higher GPA, possess better ethical awareness relative to individual situations. In addition, females possess relatively more ethical awareness in both individual and business situations than their male counterparts. Overall, it appears that most of the differences in ethical awareness between students are the result of factors unrelated to the curriculum, although a stand-alone ethics course does appear to have a modest impact.
It should be emphasized that this is an exploratory study conducted on campus in one small upper Midwestern university. It is possible that results gathered elsewhere, or results gathered using different sampling tools, may produce different results. However, the results suggest further study of the

relationship between gender, GPA, and ethical awareness may prove a useful addition to the literature. Furthermore, it would be of interest to probe the link between other non-curriculum related variables and ethical awareness. Further research is also needed to determine potentially effective ways to teach ethics.

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EFFECTS OF PERCEIVED CONTROL ON COLLEGE STUDENTS' EVALUATION OF HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

Students are known to experience significant amounts of stress and challenges during their academic pursuit at college. This study explores a way to enhance student satisfaction by incorporating a concept called perceived control to the existing service quality model. To be specific, this study proposes and tests that perceived control could be a promising factor which may enhance service quality, satisfaction, and recommendation intention among college students. Data were collected a major college in South Korea. A set of three hypotheses developed for this study were partially supported. Managerial implications are provided.

JEL: A2

KEYWORDS: marketing, services, perceived control, service quality, and student satisfaction

INTRODUCTION

Colleges, like other business, are under constant pressure to provide quality service and to win satisfaction among students to survive in a highly competitive arena. Administrators of colleges have adopted both business concepts and marketing orientation, regarding students as customers. A majority of higher education institutions have set student satisfaction as one of most important strategic goals. Those who score high on student satisfaction are considered to deliver quality education service and to have long-term program viability (Bailey and Dangerfield, 2000). In contrast, those who fail to deliver satisfactory services may fall into the trap of a vicious circle, composed of low satisfaction among students, weak academic performance among them, high dropout rates, reduced revenue, poorer service quality, and even lower satisfaction (Tinto, 1994).

Maintaining a high level of service quality and customer satisfaction at a higher education institution is very difficult, if not impossible. The customers (*i.e.*, students) are facing challenges from many different sources in their college lives: academic, social, interpersonal, financial, among others. For many, college is a stressful time, forcing one to deal with new educational and social environments (Towbes and Cohen, 1996). If these stressors are not dealt with effectively, negative consequences such as feelings of loneliness, nervousness, sleeplessness and excessive worrying may result (Wright, 1967). If one was under stress, it would be fairly difficult to experience satisfaction in that environment. To support this perspective, Ross, Niebling, and Heckert (1999, p. 312) have argued that "it is important that stress intervention programs be designed to address stress of college students."

Regardless of the pervasiveness of stress among college students, the literature on student satisfaction has paid limited attention to the stress. Studies on student satisfaction are mostly based upon the service quality paradigm. Many scholars, for example, have adopted either the SERVQUAL or SERVPERF perspective, and have tried to approach student satisfaction by enhancing the so-called five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy (Cronin and Taylor, 1993; Parasuraman et al., 1985). Albeit useful, the limitations of such approach are many (Buttle, 1996).

The purpose of this study is to explore a way to enhance student satisfaction by incorporating a concept

called perceived control to the existing service quality model. To be specific, this study proposes that perceived control could be a promising variable which would enhance service quality, satisfaction, and recommendation intention among college students. This study is organized as follows: it first provides a literature review on service quality and perceived control. Based upon the review, the study introduces its hypotheses, methodology and findings. Finally, the article concludes with implications of the findings and future research directions.

LITERATURE REVIEW

Service Quality

Service quality is an elusive concept, and there has been a considerable amount of disagreements in literature about how best to conceptualize the construct. Lewis and Booms (1983, p.10) pioneered the area and suggested a definition of service quality as a "…measure of how well the service level delivered matches the customer's expectations." This perspective was adopted by Parasuraman, Zeithaml, and Berry (1985) who developed a gap model by synthesizing (1) the expectation-disconfirmation theory concerning consumer satisfaction (Churchill and Surprenant, 1982; Lewis and Booms, 1983; Oliver, 1980), and (2) previous explorations of the dimensions of service quality (Gronroos, 1982; Sasser, Olsen, and Wyckoff, 1978). They proposed a multiple-item scale, called SERVQUAL which measures elements of service from service customers' viewpoints (Parasuraman, Zeithaml, and Berry, 1988). According to the SERVQUAL conceptualization, service quality can be assessed by five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Parasuraman et al. (1988) maintained that the 22-item scale and its five dimensions are reliable and valid in measuring service quality. SERVQUAL has been adopted and applied by many scholars. At the same time, the SERVQUAL scale has been criticized by many and the most notable challenge was made by Cronin and Taylor (1992). They proposed a "performance-based" service quality approach called SERVPERF by noting that a customer's perception of service quality is based upon his/her "perceived" attitude about the service. Cronin and Taylor (1992) reported that their unweighted performance-based SERVPERF scale was found as a better method than the gap model based SERVQUAL in measuring service quality.

The importance of service quality has been recognized in the field of higher education settings as well. Because service quality is reported to be closely related to the profit and other financial outcomes of service firms (Zeithaml, Bitner, and Gremler, 2006), administrators of colleges have adopted both service quality and student satisfaction as a cornerstone of their competitive strategy. Nowadays, no colleges are free from the necessity of understanding the antecedents, determinants, and consequences of service quality. A direct application of the service quality approach developed in other sectors to higher education contexts, however, may warrant some cautions. Customers of colleges (*i.e.*, students) are different from customers of conventional service customers. They have been described as customers in subordinate roles (Lee, 2010) where a majority of them perceive power inferiority to their service providers and have a higher likelihood to experience stress and frustration. Considering such a propensity to experience negative emotions among students, there is a surprising paucity in literature on education service quality dealing with students stress. The concept of perceived control discussed below has a high potential to incorporate that issue.

Perceived Control

The concept of perceived control has been examined in psychology in conjunction with an individual's interaction with his/her surroundings. Perceived control has been defined as one's perceived competence, superiority, and mastery over an environment (White, 1959). A number of studies have reported the crucial role of perceived control in determining negative consequences such as stress, helplessness, meaninglessness, and intention to abuse substances, as well as positive consequences such

as self-efficacy, competence, satisfaction, and physical and psychological well-being (Cohen, 1981; Langer and Saegert, 1977). Averill (1973) has offered a typology of control that makes one feel in charge of a situation. The three types of control proposed by Averill (1973) include behavioral, cognitive, and decisional controls. Averill (1973) maintained that each type of perceived control reduces one's stress and perceived risk in dealing with a potentially stressful event. In the following, each of these controls is reviewed.

1. Behavioral Control. The most widely accepted conceptualization of perceived control is one's belief of his/her ability to change the objective nature of an impending event. A group of researchers demonstrated that an individual's perception of control over a situation is largely affected by his/her belief regarding the ability to modify the objective nature of the situation (Litt, 1988; Thompson, 1981). A number of studies have found a positive relationship between the availability of responses one possesses and the ability to respond adaptively to a stressful event. One of the most notable research findings in that aspect was made by Langer and Rodin (1976) who found that one's ability to exert influences on one's environment had significant effects on one's well-being. In their study carried at nursing homes, residents of the institutions who had behavioral control (i.e., opportunities for choices, possibility of influencing nursing home policies, and small decisions to make and small responsibilities to fulfill) reported a higher level of happiness and satisfaction than those that did not have such behavioral control (Langer and Rodin, 1976). Several other studies involving medical settings have confirmed the effects of behavioral control on a person's well-being (Deci, 1980; Folkman and Moskowitz, 2000; Helgeson, 2003). According to Averill (1973), behavioral control is perceived in two conditions: (1) when one believes that s/he is capable of determining "such things as who administers the stimulus and how/when the stimulus will be encountered" (p. 287) and (2) when one believes that s/he has the right to modify the nature of an aversive event by using his/her behavioral response (e.g., avoidance, escape, attack, and so on). Thus, the theory of behavioral control suggests that perceived risk and stress in an environment can be reduced when one believes that one is able to make changes in that environment or when one is provided with a set of behavioral options from which s/he can freely choose.

2. Cognitive Control. A group of researchers observed that people become less averse to a potentially stressful event when they understand the nature of the event and when they are able to predict the consequences of the interaction (Seligman and Miller, 1979). The theory of cognitive control is built upon one's ability to subjectively incorporate the stressful event into one's cognitive plan. In Langer and Saegart's study (1977) involving a crowded supermarket, the shopping condition was reported to be felt more crowded among individuals who did not know about the crowded conditions until they entered the store than those who had been informed about it before. Langer and Saegart (1977, 181) explained that "anticipation of crowding does result in behavioral and attitudinal adjustment … [and] information about possible reactions to an environment not only makes a person feel better, but may actually increase the attention available for tasks." Averill (1973) described such ability to subjectively incorporate an aversive stimulus into one's cognitive plan as cognitive control. The theory of cognitive control has been elaborated in subsequent studies (Seligman and Miller, 1979; Taylor, 1989). Findings of those studies summarize that cognitive control is perceived as a person acquires both the specific information about an imminent event and the consequences of the event for that individual. Thus, a person would perceive less stress in dealing with a potentially stressful event when provided with sufficient information about the nature of that event in advance.

3. Decisional Control. Scholars founded upon action-theoretical perspectives noted that individuals perceive less stress in dealing with a potentially stressful event when they believe that they may gain personally desirable outcomes through their interactions with that event (Kelley, 1955; Skinner, Chapman, and Baltes, 1988). The theory of decisional control is founded upon a premise that human actions are goal-directed and therefore, an individual may perceive that s/he is in charge of a situation when s/he believes that s/he will eventually obtain a personally desirable outcome from that situation. For one to

feel such type of control, one does not need to have either predictability or a range of choice. Averill (1973, p. 300) made note on that form of control by explaining that "it is not the objective range of choices which determines whether or not a person experiences … control; rather it is the degree to which he agrees or identifies with the choices he does have, no matter how limited." Thus, when we are sure that we will eventually gain personally desirable outcomes from a potentially stressful situation, we become more tolerant of ambiguity, discomfort, and stress that are pertinent to the situation.

In summary, a person facing a potentially stressful event may find the situation less stressful when s/he perceives control in that environment. Perceived control, however, is not a simple concept but a complicated compound of interrelated yet different concepts (Rodin, Rennert, and Solomon, 1980). The theory in essence suggests that one may feel in command of a situation (1) when one believes that one can effectively influence an environmental event, (2) when one is fully informed about the nature and consequences of an event, and (3) when one knows that one may gain a personally desirable outcome by exercising one's influence, choice, or action in dealing with the event (Averill, 1973). This study applies the perspective of perceived control to the higher education setting and posits that the stress-reducing effects and satisfaction-enhancing effects of perceived control can also be observed among college students.

HYPOTHESES

The purpose of this paper is to examine whether the perception of control over their school life among college students affects their satisfaction with the school. Although attaining a college degree is considered an important career path by many people, the admission process for getting in can be quite demanding. Students who make it successfully through this process and get admitted into a rigorous program find themselves facing the challenges of academic life at a completely different level from their respective high school experiences. The competition for academic achievement, the need to perform, the enormous volumes of work and the time constraints of study, work and family are all the obvious stressors that come to mind when people think of college life (Ross et al. 1999). A significant number of students are found to experience frustration, stress, and dissatisfaction with their colleges (Zajacova et al., 2005). The academic pursuit in a college, indeed, is a potentially stressful event to many people. This study hypothesizes that students who perceive control in dealing with their colleges will evaluate their colleges more favorably than those who feel lack of control in dealing with them. Specifically, college programs that foster enhanced perceived control among their students would be evaluated as having higher quality. Furthermore, the students would experience higher levels of satisfaction from such college programs. Those students who see quality and experience satisfaction from their schools would have a higher intention to recommend their schools.

For a robust test of theory, this study adopts a macro perspective by incorporating a set of perceived control variables (behavioral control, cognitive control, and decisional control) into conventional SERVQUAL variables (tangibles, reliability, responsiveness, assurance, and empathy) to empirically test if the addition of perceived control variables would enhance service quality, satisfaction, and recommendation intention among college students. First, behavioral control is likely to affect the student's evaluation of their colleges. Students seem to prefer to make influences on their academic and non-academic aspects of college life. Compared to a program where students feel that they have no choice in their academic life but have to uniformly follow school-required procedures, a program that allows students to make choices with regard to their academic life (*i.e.,* behavioral control) is likely to foster a high level of student satisfaction. Second, students are likely to evaluate their college more favorably when the school provides them with sufficient information about the program, courses, requirements, and so on. Being fully informed about the nature of school life and specific aspects of the academic requirements (*i.e.,* cognitive control), students may be able to include possible future academic and non-academic challenges in their cognitive plan. After all, those ones having cognitive control are

more likely to actively deal with and overcome challenges that they may experience during their academic endeavor. Finally, students are likely to evaluate their school more positively when they believe that they will obtain the desired benefits from the program in the long run. When a student believes that s/he will eventually obtain desirable outcomes from college (*i.e.,* decisional control), the student is likely to deal with academic challenges with less stress and frustration and retain high hopes, which would make him/her evaluate the school more favorably. Based upon this reasoning, the following set of hypotheses was developed to test the effects of perceived control on program evaluation among college students.

H1 [a, b ,c]. Perception of behavioral control has positive influence on perceived quality [a], satisfaction [b], and recommendation intention [c] of education service among college students.

H2 [a, b ,c]. Perception of cognitive control has positive influence on perceived quality [a], satisfaction [b], and recommendation intention [c] of education service among college students.

H3 [a, b ,c]. Perception of decisional control has positive influence on perceived quality [a], satisfaction [b], and recommendation intention [c] of education service among college students.

METHODS

Data for this study were collected via a self-reported questionnaire administered to 155 students enrolled at a major college in South Korea. The questionnaire was composed of four sections: SERVPERF measures, perceived control measures, dependent measures (*i.e.*, service quality, satisfaction, and recommendation intention), and demographic questions. Likert scales were adopted as a response category for independent measures (both SERVPERF and perceived control). Service quality was measured by a modified version of SERVPERF proposed by Cronin and Taylor (1992). Cognitive control was measured by using a four-item scale, which includes the students' understanding, capability of predicting, familiarity with the program, and ability to tell strengths and weaknesses of the program in which they were enrolled.

Behavioral control was incorporated into the questionnaire by using a five-item scale that includes the choice availability in course selection, availability of exercising influence on school policies, and availability of auditing courses before registering. Decisional control was measured by a six-item scale, addressing the desirability of being in the program, appropriateness of requirements for graduation, and program efficiency. Three dependent measures (*i.e.*, service quality, satisfaction, and recommendation intention) were measured by using a 7-point scale ranging from 1 (very poor quality/very dissatisfied/least likely to recommend) to 7 (excellent quality/very satisfied/very likely to recommend).

A total of 131 useable responses were collected. Background characteristics of the participants are summarized in Table 1. Demographically, 45 percent of the respondents were female and 55 percent male. Almost all of them (98%) were in their twenties. As far as academic standings were concerned, about 92 percent of the students had cumulative GPA of 3.0 or above, and about 80 percent of them between 3.0 and 3.9. A review of demographic characteristics of the sample made by two college administrators confirmed that the sample represented the entire student population enrolled at the school appropriately.

Table 1: Background Characteristics of the Sample

Characteristics	Frequency	Percentage (*)
GENDER		
Male	72	55
Female	59	45
AGE		
< 20	1	1
21-29	129	98
> 30	1	1
GPA		
< 3.0	10	8
3.0 - 4.0	105	80
> 4.0	16	12

(*) Percentages are rounded.

RESULTS

Measurement properties of the scales developed for this study were evaluated using reliability, convergent validity, and nomological validity. The five scales regarding service quality, in general, had acceptable reliability. The scales of tangibles, reliability, responsiveness, assurance, and empathy had reliability coefficients of .68, .76, .77, .75, and .75 respectively. The scales of perceived control also had high levels of reliability. The scales of cognitive control, behavioral control, and decisional control had cronbach alpha coefficients of .79, .81, and .81, respectively.

All items of each construct had significant factor loadings greater than 2, thus providing evidence of significant convergent validity (Anderson and Gerbing, 1988). Constructs used in this study were found to behave consistently with pertinent theories in both marketing and psychology, as evidenced by the significant correlations among service quality constructs and among perceived control constructs. In summary, the measures used in this study were found to have adequate measurement properties for a theory testing. For the purpose of hypothesis testing, average scores of items making up the constructs (tangibles, reliability, responsiveness, assurance, empathy, cognitive control, behavioral control, and decisional control) were used.

Hypotheses were tested by using a series of regression analyses. The results of the hypothesis test are presented in Table 2. The table shows the regression estimates of the effects of both SERVPERF factors and perceived control factors on service quality, satisfaction, and recommendation intention, respectively. The figures in the table represent the standardized regression coefficients.

The hypothesis test revealed that students' evaluation of their college was affected by both service quality and perceived control variables. When it comes to the service quality of a college, the students' evaluation is significantly affected by reliability dimension of service quality and decisional control factor of perceived control. Thus, $H3_a$ is supported while $H1_a$ and $H2_a$ are not supported. On the contrary, the students' satisfaction is significantly affected by assurance and behavioral control. Thus, $H2_b$ is supported while $H1_b$ and $H3_b$ are not supported. Finally, the recommendation intention among students was found to be affected by both assurance and decisional control. Thus, $H3_c$ is supported while $H1_c$ and $H2_c$ are not supported.

Table 2: Effects of SERVPERF and Perceived Control on Dependent Measures

Independent Variables	Service Quality	Satisfaction	Recommendation Intention
SERVPERF			
Tangibles	0.012	0.09	0.297
Reliability	.287*	0.078	0.101
Responsiveness	0.079	0.059	0.178
Assurance	0.194	.482*	.338*
Empathy	0.145	0.168	0.145
Perceived Control			
Behavioral Control	0.112	.232*	0.016
Cognitive Control	0.054	0.089	0.062
Decisional Control	.215*	0.147	.295*
Adjusted R^2	0.178	0.268	0.289

**: Significant at .01*

DISCUSSION AND CONCLUSIONS

Findings in this study offer several insights into understanding the influence of perceived control on students' evaluation of education services rendered at higher education institutions. One of the most notable findings of this study is that perceived control variables being proposed in this study as meaningful variables in affecting students' evaluation of college services indeed contribute to the variation of the dependent variables (service quality, satisfaction, and recommendation intention) as much as those service quality variables that have been heavily studied in the literature.

Specifically, behavioral control was found to significantly affect students' satisfaction with college. Students seem to experience higher levels of satisfaction when they have the right to design their own courses for academic or non-academic activities. Decisional control exerts significant influence on both perceived service quality and recommendation intention of their colleges. When the students believe that they will obtain personally desirable outcomes through their college education, they see quality from the program and they are willing to make recommendations of their schools. Not all perceived control variables, however, were found to have significant influences on the dependent variable. Cognitive control, for example, was a variable that did not exert any significant influence on the dependent variables. In hindsight, just knowing what will happen to them may not be a sufficient condition to enhance service quality, satisfaction, and recommendation of the school.

In summary, students were found to prefer having control over their school lives. The findings of this study suggest that students want to have the ability to make influences on their academic and non-academic school lives. In addition, they prefer to have confidence that the school will offer them personally desirable outcomes. Such findings of this study should provide many managerial implications.

First, colleges should establish program diversity for their students. A college would be highly appreciated when its programs accommodate an individual's preferences and allow its students to design their course of academic and nonacademic pursuits. In addition, colleges should inform their students that they are allowed and encouraged to make suggestions that would possibly change their academic and non-academic environments. Most of all, colleges should be able to instill confidence among their

students in terms of the desirability of their efforts at the college. Those who have strong confidence that their college education will be a rewarding experience are found to not only perceive service quality but also have higher recommendation intention.

In conclusion, this article presents a perspective in enhancing student evaluation of education services rendered at colleges. Although service literature has made a notable progress over the years in enhancing our understanding of service quality and satisfaction, most of them have been guided by the service quality paradigm. The perspective of perceived control provided in this study is expected to complement our understanding on service quality and satisfaction. Future research using the perspective is highly expected.

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SKILLS NEEDED IN THE 21st CENTURY WORKPLACE: A COMPARISON OF FEEDBACK FROM UNDERGRADUATE BUSINESS ALUMNI AND EMPLOYERS WITH A NATIONAL STUDY

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ABSTRACT

The purpose of this research was to determine what skills alumni from Richard Stockton College of New Jersey (RSC) and regional employers think are important for the workplace. The results of the RSC study were compared to results from the report, College Learning for the New Global Century, sponsored by the Association of American Colleges and Universities.

Managing time, speaking/oral communications skills, and having strong interpersonal skills were in the top five skills identified by both employers and alumni of The Richard Stockton College. A statistically significant greater percentage of employers who participated in the study commissioned by the Association of American Colleges and Universities identified knowledge of global issues as being an essential learning outcome compared with the employers and alumni surveyed in the RSC study who identified knowledge of global issues as being a very important or important skill for the workplace. The lower priority given to global issues and international perspectives by employers and alumni in this study may have been due to the location of their workplaces. Respondents to the surveys were located primarily in the central and southern areas of New Jersey where industries and corporations had a regional rather than an international focus. Faculty in the School of Business should consider incorporating those skills identified as important or very important by the majority of alumni and employers into the curriculum as well as emphasizing global issues in their courses.

JEL: A23, M00

KEYWORDS: AASCB accreditation, accountability in higher education, skills, business graduates

INTRODUCTION

In this environment of accountability to consumers and stockholders, members of businesses and government agencies question how well college graduates are being prepared for work in the global economy. Accrediting bodies and legislators are calling for greater accountability on the part of higher education faculty regarding the quality and relevance of their curricula, their assessment of student-learning outcomes, and their commitment to continuous improvement in course content based on regular feedback from the external community. To demonstrate accountability, faculties at colleges and universities are incorporating TQM approaches in their strategic planning, assessment of student outcomes, and curriculum development (Wessel, 2007).

Accountability efforts focus on meeting the needs of the marketplace, establishing measurable standards and benchmarks, and providing evidence of student learning. In higher education, accreditation bodies set standards and call for proof of adherence to those standards (Academic Quality Improvement Program, 2005). For example, the Association to Advance Collegiate Schools of Business (AACSB) accreditation standards requires business programs to provide assurances of learning to external stakeholders and the students who are the consumers of academic programs (AACSB, 2006). To comply with the AACSB's

assurances of learning standards, business school faculty must develop, monitor, evaluate, and revise the substance and delivery of curricula and assess the impact of curricula on learners. This curriculum management process necessitates input from faculty, staff, administrators, students, alumni, and members of the business community.

With the formation of the Secretary of Education's Commission on the Future of Higher Education, a national effort was organized to hold higher education institutions accountable for the preparation of college students for jobs that meet the economic and workforce needs of the future (U.S. Department of Education, 2005). The Commission on the Future of Higher Education is renewing pressure on colleges and universities to be accountable for student outcomes. Accountability issues raised by the commission focus on the need for graduates to receive academic preparation that is aligned with the employment needs of the 21st century. Accrediting agencies and faculty at colleges are encouraged to provide assessments that indicate students leave college with the skills they need to be productive workers and citizens (Lederman, 2006; Quevedo, 2007; Yankelovich, 2005).

This study was designed to assess if the feedback from alumni and employers of alumni in an undergraduate business program at The Richard Stockton College, a public, 4-year college, with a focus on liberal arts, correlates with the results of the study commissioned by the Association of American Colleges and Universities and presented in the report *College Learning for the New Global Century.* The report focused on the knowledge, skills, and competencies college graduates should have for workplace success (Association of American Colleges and Universities, 2008).

The purpose of the study at The Richard Stockton College was to address the following research questions:

> 1. According to employers and business alumni from The Richard Stockton College, what knowledge, skills, and competencies are considered most valuable for successful performance in the workplace?
>
> 2. According to employers and business alumni from The Richard Stockton College, what knowledge, skills, and competencies are considered to be least essential for successful performance in the workplace?
>
> 3. What knowledge, skills, and competencies are identified by employers as important for workplace success in the study commissioned by the Association of American Colleges and Universities, *College Learning for the New Global Century* (Association of American Colleges and Universities, 2008)?
>
> 4. How do the results from the surveys of employers of The Richard Stockton College business graduates and the business alumni at the college correlate with those indicated as essential learning outcomes in the study commissioned by the Association of American Colleges and Universities, *College Learning for the New Global Century* (Association of American Colleges and Universities, 2008)?

Findings of this research will be used to guide revisions to the business curricula at The Richard Stockton College to ensure that the skills and competencies taught are relevant to the needs of the business community and graduates develop the skills and competencies they need for success in the workplace.

This paper will present a review of the literature, the methodology used in the study, the results and analysis of the data, the limitations to the study, and recommendations for future research.

LITERATURE REVIEW

Addressing Workplace Knowledge, Skills, and Abilities

Colleges and universities have many stakeholders: students, faculty, students' parents, employers, public officials, community leaders, and the general public. These stakeholders share a common need to know whether institutions of higher learning are preparing students adequately for future jobs (Association of American Colleges and Universities, 2008; Gumport, 2001). In the 21st century higher education institutions are expected to do more to assure that students leave colleges and universities with the skills they need to be productive workers and citizens than in the past.

The reports by task forces, commissions, and accrediting bodies expressed concern about the quality of undergraduate student learning related to skills that are needed in the workplace. In their undergraduate education, students should develop the necessary skills, abilities, attitudes, and values that are essential to success in the complex business world. Faculty in higher education must address the diverse demands placed on graduates rather than concentrate on narrowly focused, job-specific technical skills. If higher education is to provide graduates with the knowledge and skills they need in the workplace of the 2lst century, curricula must change to reflect the dynamic needs of business (Association of American Colleges and Universities, 2008; RAND, 2004; Zekeri, 2004).

Changing Business Environment

Changing global economic forces, innovations in technology, and the growth of cultural diversity in the workplace create a business environment that is different from that of a generation ago. Today corporations are flatter, less hierarchical, and more focused on quality in product production and customer satisfaction. Terms such as *global competition*, *customization*, *deregulation*, *outsourcing*, *pay for performance*, *downsizing*, and *TQM* describe the business environment of the 21st century (Association of American Colleges and Universities, 2008; Stasz, 2001; Warren, 2003; Yankelovich, 2005). These changes influence the competencies and skills that graduates of college business programs need to be successful.

The skills students bring to the workplace should be those that businesses need (Association of American Colleges and Universities, 2008; RAND, 2004). Increasingly, employers are searching for employees who have strong abilities in problem solving, teamwork, oral and written communications, leadership, learning, managing others, handling customer relations, and system thinking (Association of American Colleges and Universities, 2008; E. A. Jones, 2002; Peterson, 2004; Zekeri, 2004). According to RAND (2004) and Archer (2002), shortages of candidates who are qualified for employment exist in many sectors of the economy and are expected to increase in the future as the baby boomers continue to retire. Business programs that offer curricula that are based on market needs will produce more graduates who are prepared for the demands of the workplace (Cleary & Fichtner, 2007; RAND, 2004).

To create relevant curricula, business college faculty members need to become aware of the skills and competencies needed in the workplace and the entry-level job criteria for graduates of their programs (Association of American Colleges and Universities, 2008; Peterson, 2004; Yankelovich, 2005). To identify these skills and competencies, educators need to engage members of the business community in the evaluation of student competencies. This process requires outreach to alumni and employers (Association of American Colleges and Universities, 2008; Roberson et al., 2002). Stakeholder feedback can assist faculty members as they review and update courses and programs.

Curriculum Development

By obtaining input from the business community, faculties can determine how to meet the needs of graduates and other stakeholders. It is important to understand what graduates need to know as they enter the workforce and what skills will serve them well during their careers (Ferguson, 2004).

Stiehl and Lewchuk (2002) stated that one of the first steps in curricula design should be for faculty to learn what their students need to be able to do in the workplace. With input from external stakeholders, faculty can make informed decisions about what particular skills and competencies are most important for their students and for the employers of their graduates. Once the necessary skills are identified, faculty should design curricula that incorporate those skills and competencies. With feedback from external stakeholders, faculty can develop curricula that are structured around management, marketing, and finance courses in which the teaching of academic skills is embedded (Ferguson, 2004).

METHODOLOGY

Development of the Survey

In evaluation research there is formative and summative evaluation. In instructional design, formative evaluation is one method that can be used to improve curriculum content through receiving feedback from stakeholders and experts; based on this feedback, the curricula can be improved by identification and remediation of the problem areas which have been identified. Summative evaluation lets stakeholders know if the program or curricula accomplished what it was designed to accomplish (Trochim, 2002; Weston, Mc Alpine, & Bordonaro, 1995).

As part of the evaluation methodology that was used to develop the survey instrument, a formative committee was assembled to identify the business skills and competencies that are important to students' success in the workplace and should be in the business curricula. The formative committee consisted of two tenured business faculty members, the assistant provost for academic affairs, and the director of career services at The Richard Stockton College of New Jersey. The tenured professors on the formative committee are senior faculty who teach classes in the required academic core for general business courses. The formative committee members knew the skills and competencies being taught in the business curricula. The committee members examined sample survey questions about graduates' skills and competencies that are needed in the workplace from four AACSB accredited schools of business. These universities were Auburn University, University of Wisconsin, and Western Carolina University. From their knowledge and reference to the sample questions on skills and competencies, the committee members made recommendations about questions that should be included on the selected college's survey for alumni and for employers. There were 24 skills and competencies selected to be evaluated by alumni and employers as very important, important, limited importance, or not important.

Data Collection

A survey packet was mailed during April 2008 to 2,383 alumni and 145 employers of The Richard Stockton College of New Jersey that explained the study, provided information on informed consent for participation in the study and presented the questions for the study.

Alumni were asked to place a check mark in the column that best represents their views regarding the importance of 24 different skills or competencies in performance of their job. Employers were asked to rate the importance of the same 24 skills and competencies in their organization. Both employers and alumni rated the skills as very important, important, limited importance, or not important. Of the 24 survey questions agreed to by the members of the formative and summative committee members, 12 of

the questions related to the data presented the *College Learning for the New Global Century* (Association of American Colleges and Universities, 2008).

RESULTS AND ANALYSIS

Research Question 1: According to employers and business alumni from The Richard Stockton College, what knowledge, skills, and competencies are considered most valuable for successful performance in the workplace?

To answer research question number one the researchers ranked the top five skills identified by alumni and employers as very important or important. After ranking the top five skills we determined whether there were statistically significant differences in the percentage of alumni and employers who thought the skill was very important. Finally, we assessed all of the 24 skills to determine which skills had a statistically different percentage of alumni and employers who identified that skill as very important or important.

Table 1 lists the 24 skills and the percentage and number of alumni who reported that the skill was very important or important for the workplace. The numbers were determined by adding the number of respondents who identified the skill as very important with the number of respondents who identified the skill as very important or important.

Table 1 Alumni and Employers Identifying Skills as Very Important or Important for the Workplace

Skill	Percent Alumni (Number Alumni)	Percent Employer (Number Employer)	p-value	Is Percent Difference Significant?
Managing Time	96% (153)	100% (45)	0.007	**Yes**
Interpersonal Skills	96% (154)	100% (45)	0.013	**Yes**
Speaking/Oral Communication	96% (155)	98% (44)	0.571	No
Ethical Understanding	81% (128)	98% (44)	0.000	**Yes**
Adapting to Change and Being Flexible	94% (152)	96% (43)	0.748	No
Locating, Organizing, Evaluating Relevant Information	97% (156)	95% (42)	0.674	No
Written Communication Skills	94% (150)	93% (42)	0.808	No
Leadership/ Motivation Skills	87% (139)	91%(41)	0.398	No
Thinking Creatively to Solve Problems	92% (148)	91% (41)	0.864	No
Working Independently	94% (151)	91% (40)	0.461	No
Teamwork Skills	92% (147)	89% (40)	0.563	No
Thinking Critically/Analytically:	98% (156)	86% (38)	0.036	**Yes**
Computer Skills/Information Technology	93% (150)	84% (38)	0.130	No
Respecting and Valuing Diversity Issues	77% (123)	84% (38)	0.233	No
Understanding Market Trends in the Industry	71% (108)	79% (33)	0.305	No
Understanding Law/ Regulations on Business Decisions	72% (114)	77% (33)	0.533	No
Basic Knowledge of Management Principles	75% (119)	71% (32)	0.579	No
Basic Knowledge of Marketing Principles	59% (91)	71% (30)	0.136	No
Basic Knowledge of Economic Principles	57% (88)	69% (27)	0.138	No
Quantitative Reasoning: Ability to use mathematics or statistics	72% (113)	61% (27)	0.194	No
Basic Knowledge of Accounting Principles	71% (111)	60% (24)	0.192	No
Knowing Basics of Financial Theories and Analysis	74% (116)	57% (25)	0.033	**Yes**
Understanding the Influence of Political, Social Issues on Business Decisions	57% (89)	53% (23)	0.678	No
Basic Knowledge of Global Issues/International Perspectives	38% (58)	43% (17)	0.620	No

Table 1 lists the 24 skills and the percentage and number of alumni that reported that the skill was very important or important for the workplace sorted in descending order on the percent employer column. The p-value calculated by using the method for statistical inference for the difference of two sample proportions with different sample sizes is reported in the third column of Table 1. The last column of table 1 tells whether the difference is significant.

The researchers hypothesized that there would be differences between what skills the alumni and employers thought were very important or important for the workplace. Statistical hypothesis testing was used to evaluate the significance of the percent differences between the two samples. The null hypothesis for a factor, such as managing time, for example, is that alumni and employers have the same percentage of respondents who think the skill is very important. The p-value was calculated by using the method for statistical inference for the difference of two sample proportions with different sample sizes. The null hypothesis is rejected if the p-value is less than 0.05. Rejecting the null hypothesis implies that a significant difference exists between the percentage of alumni and employers that identified the skill as very important. The p-value is reported in the third column of Table 1. Whether or not the percent difference is significant is reported in the last column of Table 1. The top 5 skills that alumni identified as very important or important were: Thinking critically/analytically (98%); Locating, Organizing, Evaluating Relevant Information (97%); Interpersonal skills (96%); Time management (96%); and Speaking/oral communications (96%)

The top five skills that employers identified as very important or important were: Interpersonal skills (100%); Time management (100%); Speaking/oral communications (98%); Ethical Understanding (98%); and Adapting to change/being flexible (96%).

Managing time, speaking/oral communications skills, and having strong interpersonal skills were in the top five skills identified by both employers and alumni. Alumni rated thinking critically/analytically and locating, organizing, evaluating relevant information as two of the top five skills as being very important or important whereas employers did not rate these skills in their top five choices. Ethical understanding and adapting to change and being flexible were in the employer's top five skills, but not the alumni's. There was a statistically significant greater percentage of alumni (98% versus 86%) than employers who rated critical thinking as being a very important or important skill. There was a statistically significant greater percentage of employers than alumni that rated ethical understanding (98% versus 86%), interpersonal skills (100% versus 96%), and time management (100% versus 96%) as being a very important or important skill. Despite the statistically significant difference in the percentage of employers and alumni identifying interpersonal skills and time management, both of these skills were in the top five skills that alumni rated as important or very important.

The researchers also examined the results from the hypothesis testing to determine what other skills there were significant percent differences. Although not in the top five choices of employers and alumni, alumni had a statistically significantly greater percentage of respondents who thought Knowing Basics of Financial Theories and Analysis was a very important or important skill (74% versus 57%). This difference could be attributed to the employer's industry and the industry in which the alumni work.

<u>Research Question #2: According to employers and business alumni from The Richard Stockton College, what knowledge, skills, and competencies are considered to be least essential for successful performance in the workplace?</u>

Table 2 lists the 24 skills and the percentage and number of alumni who reported that the skill was not important for the workplace. The researchers hypothesized that there would be differences between what skills the alumni and employers thought were not important or of limited importance for the workplace. Statistical hypothesis testing was used to evaluate the significance of the percent differences between the two samples. The top 5 skills that alumni identified as being of limited importance or not important were: Basic knowledge of global issues/international perspectives (62%); Basic knowledge of economic principles (43%); Understanding the influence of political and social issue on business decisions (43%); Basic knowledge of marketing principles (41%); and Understanding marketing trends in the industry (29%).

The top five skills that employers identified as being of limited importance or not important were: Basic knowledge of global issues/international perspectives (58%); Understanding the influence of political and social issue on business decisions (47%); Knowing the basics of financial theory and analysis (43%); Basic knowledge of accounting principles (40%); and Quantitative reasoning: Ability to use mathematics or statistics (39%).

Both the alumni and employers identified basic knowledge of global issues/international issues as the least important skill. The Richard Stockton College of New Jersey is a state university in which the majority of the students attending the college are from New Jersey. The majority of employers surveyed are regional businesses that do not have a global presence. Hence, the survey respondents did not rate knowledge of global/international issues as important or essential since these issues do not influence regional businesses in the same way they affect multinational corporations with a global presence.

Table 2: Alumni and Employers Identifying Skills as Limited Importance or Not Important for the Workplace

Skill	Percent Alumni (Number Alumni)	Percent Employer (Number Alumni)	p-value	Is Percent Difference Significant?
Thinking Creatively to Solve Problems	8% (13)	9% (4)	0.864	No
Working Independently	6% (9)	9% (4)	0.461	No
Leadership/ Motivation Skills	13% (21)	9% (4)	0.398	No
Written Communication Skills	6% (9)	7% (3)	0.808	No
Basic Knowledge of Global Issues/International Perspectives	62% (94)	58%(23)	0.620	No
Locating, Organizing, Evaluating Relevant Information	3% (5)	5% (2)	0.674	No
Understanding the Influence of Political, Social Issues on Business Decisions	43% (67)	47% (20)	0.678	No
Knowing Basics of Financial Theories and Analysis	26% (40)	43% (19)	0.033	**Yes**
Basic Knowledge of Accounting Principles	29% (45)	40%(16)	0.192	No
Adapting to Change and Being Flexible	6% (9)	4% (2)	0.748	No
Quantitative Reasoning: Ability to use mathematics or statistics	28% (44)	39% (17)	0.194	No
Basic Knowledge of Economic Principles	43% (67)	31%(12)	0.138	No
Basic Knowledge of Management Principles	25% (39)	29%(13)	0.579	No
Basic Knowledge of Marketing Principles	41% (62)	29%(12)	0.136	No
Understanding Law/ Regulations on Business Decisions	28% (44)	23% (10)	0.533	No
Understanding Market Trends in the Industry	29% (44)	21% (9)	0.305	No
Speaking/Oral Communication Skills	4% (6)	2% (1)	0.571	No
Ethical Understanding	19% (31)	2% (1)	0.000	**Yes**
Computer Skills/Information Technology	7% (11)	16% (7)	0.130	No
Respecting and Valuing Diversity Issues	23% (37)	16% (7)	0.233	No
Thinking Critically/Analytically	3% (4)	14% (6)	0.036	**Yes**
Teamwork Skills	8% (13)	11% (5)	0.563	No
Managing Time	4% (7)	0% (0)	0.007	**Yes**
Interpersonal Skills	4% (6)	0% (0)	0.013	**Yes**

Table 2 lists the 24 skills and the percentage and number of alumni that reported that the skill was of limited importance or not important for the workplace sorted in descending order on percent employer.. The p-value calculated by using the method for statistical inference for the difference of two sample proportions with different sample sizes is reported in the third column of Table 1. The last column of table 1 tells whether the difference is significant.

Understanding the influence of political and social issues on business decisions was in the top five skills selected as being of limited importance or not important. Employers identified knowing the basics of financial theory and analysis, basic knowledge of accounting principles, and quantitative reasoning as the five least important skills. A statistically significantly greater percentage (43% versus 26%) of employers identified knowing the basics of financial theories and analysis as being of limited importance or not important for the workplace. Basic knowledge of economic principles, basic knowledge of marketing

principles, and understanding market trends in the industry were in the alumni's top five choices for skills of limited importance or not important for the workplace. There were no significant differences between the alumni and employees identifying basic knowledge of accounting principles, quantitative reasoning, basic knowledge of economic principles, and understanding market trends in the industry.

Analysis of Skills

After reviewing the top 5 skills identified as being important or very important with the top five skills that were rated as being of limited importance or not important by the alumni and employers it is evident that the skills both alumni and employers believe are important are skills that focus on the graduate's ability to manage the demands of the workplace rather than on narrowly focused job specific technical skills. Understanding accounting, economic, and marketing principles, and knowing the basics of financial theories/quantitative reasoning are narrowly focused job specific technical skills that were identified by employers and alumni to be the less essential skills needed for the workplace. However, over 50% of the respondents did identify basic knowledge of economic, accounting, and marketing principles to be important or very important. The only skill that was identified as being of limited importance or not important was basic knowledge of global issues/international perspectives. The survey respondents are primarily from Central and Southern New Jersey and did not rate knowledge of global/international issues as important or essential since these issues do not influence regional businesses in the same way they affect multinational corporations with a global presence.

Research Question #3: What knowledge, skills, and competencies are identified by employers as important for workplace success in the study commissioned by the Association of American Colleges and Universities, *College Learning for the New Global Century* (Association of American Colleges and Universities, 2008)?

In the report, *College Learning for the New Global Century* (Association of American Colleges and Universities, 2008), research findings were presented on the views of employers regarding assessment approaches used in institutions of higher education. Issues of access, affordability, and accountability, as well as what contemporary college graduates need to know and be able to do when they enter the workplace, were addressed. Educators and employers reached a consensus about the learning and skill sets American workers need from their college experience and recommended that presidents, trustees, school leaders, and employers work together to build public understanding of what knowledge and skills matter in a 21st-century college education. These stakeholders should champion and support essential learning outcomes in content and skill areas that college graduates need as they enter the workplace (Association of American Colleges and Universities, 2008).

In 2006 and 2007, Peter D. Hart Associates, Inc. was appointed by the AACU (2008) to quantitatively and qualitatively assess viewpoints of employers regarding students' learning in college. Interviews were conducted with 305 employers whose companies had at least 25 employees and reported that 25% or more of their new hires held at least a bachelor's degree from a 4-year college. In November and December of 2007, an additional 301 employers were interviewed. The following list summarizes the skills areas that the majority of employers would like colleges and universities to emphasize more when preparing graduates for the global economy and workplace: Concepts and new developments in science and technology (82%); Teamwork skills and the ability to collaborate with others in diverse group settings (76%); Communication skills, both oral and written (73%); Critical-thinking and analytical-reasoning skills (73%); Global issues and developments and their implications for the future (72%); The ability to locate, organize, and evaluate information from multiple sources; Innovative and creative thinking (70%); The ability to solve complex problems (64%); The ability to work with numbers and understand statistics (60%); An understanding of the role of the United States in the world (60%); A sense of integrity and ethics (56%); and An understanding of cultural values and traditions in America

and other countries (53%) (Association of American Colleges and Universities, 2008). These 12 skills are similar to skills identified in the RSC survey.

Table 3 lists the skills from the researchers' survey and the corresponding skill from the AACU study that the researchers identified as being a similar skill. Note the wording in The Richard Stockton College (RSC) survey differs from the wording of the questions in the AACU study. In – the RSC survey the researchers identified oral communication skills/speaking and written communication skills as two separate skills whereas the AACU survey combined the skills as the ability to communicate orally and in writing. The researchers identified computer skills/information technology as similar to the skill understanding concepts and new developments in science and technology. The RSC survey questions did not address understanding the concepts of science and technology and may have been interpreted as being able to use a computer rather than understanding the concept and development of technology. The researchers combined the concepts of thinking creatively and problem solving whereas the survey conducted for the AACU delineated the skills separately as the ability to think creatively and the ability to solve problems. The survey conducted for the AACU was more specific in stating the essential outcome of identifying the role of the United States in the world compared to the wording of the RSC survey that generally identified global understanding as ~~having~~ a basic knowledge of global issues/international perspective.

Table 3: Comparison of Skills from the RSC Survey That Are Identified as Similar to the Skill in the AACU Survey

Skill (RSC Survey)	**Similar Skill (AACU Survey)**
Computer Skills/Information Technology	Concepts and new developments in science and technology (82%)
Teamwork Skills	Team work skills and the ability to collaborate with others in diverse group settings (76%)
Written Communication Skills	The ability to communicate orally and in writing (73%)
Speaking/Oral Communication Skills	The ability to communicate orally and in writing (73%)
Thinking Critically/Analytically: Evaluating and analyzing information; integrate information from sources	Critical thinking and analytical reasoning skills (73%)
Basic Knowledge of Global Issues/International Perspectives	Global issues and developments and their implications for the future (72%)
Locating, Organizing, Evaluating Relevant Information: Know where to locate information and how to evaluate information for relevance	The ability to locate, organize, and evaluate information from multiple sources (70%)
Thinking Creatively to Solve Problems	The ability to be innovative and think creatively (70%) The ability to solve complex problems (64%)
Quantitative Reasoning**:** Ability to use mathematics or statistics	The ability to work with numbers and understand statistics (60%)
Basic Knowledge of Global Issues/International Perspectives	The role of the United States in the world (60%)
Ethical Understanding	A sense of integrity and ethics (56%)
Respecting and Valuing Diversity/ Multicultural Issues	Cultural Values and traditions in America and other countries (53%)

Research Question #4. How do the results from the surveys of employers of The Richard Stockton College business graduates and the business alumni at the college correlate with those indicated as essential learning outcomes by the AACU study *College Learning for the New Global Century* (Association of American Colleges and Universities, 2008)?)

When comparing the results of the RSC survey to the results of the AACU study it is important to note that the analysis is limited because some of the questions are a closer match to the essential learning outcomes identified in the AACU survey than others.

The first column of Table 4 identifies the skill from the RSC survey. The second column lists the percentage of employers in the study commissioned by the Association of American Colleges and Universities who identified each skill as an essential learning outcome. The percentage of employers who

identified the skill as very important or important is listed in the third column and the percentage of employers who identified the skill as very important is listed in the fifth column. The researchers hypothesized that there would be differences between the between what skills the employers thought were essential for the workplace and the skills the employers in the AACU survey identified as essential outcomes. Statistical hypothesis testing was used to evaluate the significance of the percent differences between the two samples.

Table 4: Comparison of the Responses of employers in the RSC Study to Responses from Employers Participating in the Study commissioned by the Association of American Colleges and Universities

Skill	**Percent Employer From AACU Study (305 surveyed)**	**Percent Very Important or Important Employer (45 surveyed)**	**p-value**	**Is Percent Difference Rating as Very Important or Important Significant?**	**Percent Very Important Employer (45 surveyed)**	**p-value**	**Is Percent Difference Rating as Very Important Significant?**
Computer Skills/Information Technology	82%	84%	0.734	No	47%	0.000	Yes
Teamwork Skills	76%	89%	0.014	Yes	58%	0.020	Yes
Written Communication Skills	73%	93%	0.036	Yes	71%	0.794	No
Speaking/Oral Communication Skills	73%	98%	0.000	Yes	80%	0.280	No
Thinking Critically/Analytically	73%	86%	0.025	Yes	50%	0.004	Yes
Basic Knowledge of Global Issues/International Perspectives	72%	43%	0.000	Yes	8%	0.000	Yes
Thinking Creatively to Solve Problems	70%	91%	0.000	Yes	60%	0.198	No
Locating, Organizing, Evaluating Relevant Information	70%	95%	0.000	Yes	43%	0.001	Yes
Quantitative Reasoning:	60%	61%	0.899	No	18%	0.000	Yes
Ethical Understanding	56%	98%	0.000	Yes	62%	0.440	No
Respecting and Valuing Diversity Issues	53%	84%	0.000	Yes	51%	0.802	No

Table 4 compares the responses from employers participating in the RSC study to the responses of employer participating in the study commissioned by the Association of American Colleges and Universities (AACU study).

The first hypothesis test was to determine whether there were significant differences between the percentage of employers in the RSC survey who identified the skill as important or very important and percentage of employers in the study commissioned by the Association of American Colleges and Universities who identified each skill as an essential learning outcome. The p-values for the hypothesis test and whether the result was significant are listed in the fourth and fifth columns. The results for the skills computer skills/information technology and quantitative reasoning did not show significant percentage differences between the employers and the RSC study and the study commissioned by the Association of American Colleges and Universities. Both groups had a similar percentage of employers that thought these skills were essential for graduates to have. However a statistically significantly greater percentage of employers from the RSC study thought teamwork skills, speaking/oral communication skills, written communication skills, critical thinking, thinking creatively to solve problems, locating, organizing, evaluating relevant information; quantitative reasoning, and ethical understanding than the employers in the study commissioned by the Association of American Colleges and Universities. However, a statistically significant percentage of employers from the AACU study identified basic

knowledge of global issues/international perspectives as an essential skill than the employers in the RSC study.

Since the employers in the researchers' study were asked to rate skills as important or very important and the employers in the study commissioned by the Association of American Colleges and Universities were asked to identify essential learning outcomes, the researchers decided that since all of the skills except basic knowledge of global issues/international perspectives and quantitative reasoning were identified as important or very important by over 80% of the employer respondents, the researchers decided to compare the results of the percentage of employers identifying a skills as very important to the percentage of employers identifying a skill as very important. Statistical hypothesis testing was used to evaluate the significance of the percent differences between the two samples. The p-values and whether the results were statistically significant are listed in the last two columns of table 4. A statistically significantly greater percentage of employers in the study commissioned by the Association of American Colleges and Universities identified the following skills as essential learning outcomes than the employers in the RSC study identified as very important for the workplace: Computer skills/information technology (82% versus 47%); Teamwork skills (76% versus 58%); Thinking critically/Analytically (73% versus 50%); Basic knowledge of global issues/perspectives (43% versus 8%); Locating, organizing, evaluating relevant information (70% versus 43%); and Quantitative reasoning (60% versus 18%).

A statistically significantly greater percentage of employers in the RSC survey identified ethical understanding as "very important" than the employers in the study commissioned by the Association of American Colleges and Universities who identified ethical understanding as an essential learning outcome.

Similar percentages were found between the two groups for oral communications/speaking, written communications, thinking creatively to solve problems, and respecting and valuing diversity when employers from the RSC study rated the skills as very important.

Collectively statistically significant differences were found between the percentage of employers in the RSC study and the employers from the study commissioned by the Association of American Colleges and Universities regardless of whether the responses from employers in the RSC study was important or very important or only very important for the following skills: Teamwork skills; Thinking critically/analytically; and Locating, organizing, evaluating relevant information

These results are indicated by having a yes in both columns 5 and 8 to show the results are statistically significant for either criterion. For the skills teamwork skills, thinking critically/analytically, and locating organizing, evaluating relevant information a statistically significant greater percentage of employers from the RSC study rated the skill as important or very important than the employers from the study commissioned by the Association of American Colleges and Universities. However, when the percentage of employer who rated skills as very important from the RSC study was compared to the percentage of the employers from the study commissioned by the Association of American Colleges and Universities who rated the skills as essential learning outcomes the results were different. When the criteria was changed to the RSC employers rating the skill as very important a statistically significant greater percentage of employers the study commissioned by the AACU rated teamwork skills, thinking critically/analytically, and locating organizing, evaluating relevant information skills as essential outcomes.

There was one finding that was true regardless of whether the employers rated a skill as very important or important or rated the skill as very important. A statistically significantly greater percentage of employers from the study commission by the AACU considered basic knowledge of global issues/perspectives as an essential learning outcome compared to the employers from the RSC study regardless of whether the skill was rated as important or very important or rated as important. Hence, when comparing the results of the

RSC study with the study commissioned by the AACU whether or not statistically significant differences exist between the two studies depends on whether a skill was rated as important or very important.

Limitations

Several limitations existed in this study. One limitation is that data were collected from respondents associated with one college and the findings may not be generalized to other colleges. In addition, data collected from the employers and business alumni from the Richard Stockton College were limited by the region in which the business alumni and employers were located; the regional industries were in the following sectors: financial and insurance, hospitality, health care, tourism, education, and public service. There were few industries in the region that were nationally or internationally based.

Another limitation of the study was that the mailing addresses for the business alumni and for the employers were not kept current; mailed surveys were returned because of incorrect, undeliverable addresses for the alumni and for employers. Specifically of the 2,383 alumni who received the survey packets, 300 were returned due to undeliverable addresses. Of the 140 survey packets mailed to employers, 45 surveys were returned because of undeliverable addresses. The sample size of 45 employers is very limited.

Since a convenience sample was used, distribution of respondents was skewed more to two industries: of the respondents, 25% of the alumni and 16%of employers indicated they worked in the professional services sector, which includes accountants; 23% of the alumni and 24% of employers indicated they worked in the finance and insurance industries. The representation coming from the professional services, finance, and insurance industries may have influenced survey responses regarding skills and competencies needed in the workplace.

Finally the criteria for evaluating skills as important or very important versus rating them as very important showed different results when comparing the RSC study to the study commissioned by the Association of American Colleges and Universities . In order to make a more accurate comparison the researchers could have asked respondents to identify skills that they thought are essential learning outcomes.

CONCLUSION

This study was designed to assess if the feedback from alumni and employers of alumni in an undergraduate business program at The Richard Stockton College, a public, 4-year college, with a focus on liberal arts, correlates with the results of the study commissioned by the Association of American Colleges and Universities College Learning for the New Global Century.

A survey packet was mailed during April 2008 to 2,383 alumni and 145 employers of The Richard Stockton College of New Jersey that explained the study, provided information on informed consent for participation in the study and presented the questions for the study. Alumni were asked to place a check mark in the column that best represents their views regarding the importance of 24 different skills or competencies in performance of their job. Employers were asked to rate the importance of the same 24 skills and competencies in their organization. Both employers and alumni rated the skills as very important, important, limited importance, or not important. Managing time, speaking/oral communications skills, and having strong interpersonal skills were in the top five skills identified by both employers and alumni of The Richard Stockton College of New Jersey as important or very important. A statistically significant greater percentage of employers who participated in the study commissioned by the Association of American Colleges and Universities rated knowledge of global issues as being an essential learning outcome compared with the employers and alumni surveyed in the RSC study who

rated knowledge of global issues as being a very important or important skill for the workplace. The lower priority given to global issues and international perspectives by employers and alumni in this study may have been due to the location of their workplaces. Respondents to the surveys were located primarily in the central and southern areas of New Jersey where industries and corporations had a regional rather than an international focus. Faculty in the School of Business should consider incorporating those skills rated as important or very important by the majority of alumni and employers into the curriculum as well as emphasizing global issues in their courses.

The limitations of the study are that the data was collected from respondents associated with one college and the findings may not be generalized to other colleges, the sample was a convenience sample, the number of employers was limited, and the questions on our survey were not an identical match to the survey commissioned by the American Association of Colleges and Universities. The study could be replicated in the future using a national base of employers and from alumni from several universities. The survey, if conducted every few years, could be a barometer for the skills needed in a changing economy.

APPENDIX

Survey: Place a check mark in the column that best represents your views regarding the importance of the following skills or competencies in performance of your job.

	Very Important	Important	Limited Importance	Not Important	Not Applicable
Written Communication Skills					
Speaking/Oral Communication					
Respecting and Valuing Diversity/ Multicultural Issues					
Ethical Understanding					
Locating, Organizing, Evaluating Relevant Information: Know where to locate information and how to evaluate information for relevance					
Thinking Critically/Analytically: Evaluating and analyzing information; integrate information from sources					
Knowing Basics of Financial Theories and Analysis					
Quantitative Reasoning: Ability to use mathematics or statistics					
Understanding the Influence of Political, Social Issues on Business Decisions					
Understanding Market Trends in the Industry and the Company's Position in the Market					
Understanding Law/ Regulations on Business Decisions					
Computer Skills/Information Technology					
Teamwork Skills					
Managing Time					
Thinking Creatively to Solve Problems					
Working Independently					
Interpersonal Skills					
Adapting to Change and Being Flexible					
Leadership/ Motivation Skills					
Basic Knowledge of Global Issues/International Perspectives					
Basic Knowledge of Economic Principles					
Basic Knowledge of Accounting Principles					
Basic Knowledge of Marketing Principles					
Basic Knowledge of Management Principles					

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STUDENT PERCEPTION OF TEACHING QUALITY IN BUSINESS SCHOOLS: EVIDENCE FROM POLYTECHNIC INSTITUTIONS IN GHANA

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ABSTRACT

The study examines students' perceptions of the effectiveness of teaching and learning in business studies programs in the polytechnic institutions in Ghana. This research is a replica study (Hamid and Pihie, 2004). Two major factors are employed to measure students' perceptions of effective teaching and learning. They are Lecturers' Characteristics and Teaching Methodology. Findings of the study show how respondents perceive the qualities possessed and exhibited by lecturers with regard to the two main constructs. Descriptive and inferential statistics are reported. F ratio and ANOVA were used to show the significant differences in students' perceptions of the two factors based on age, class, and department. There were significant differences in the perceptions of overall Lecturer Characteristics, and in the perceptions of Teaching Methodology based on these variables. The study revealed high students' perception of teaching quality and learning in the Polytechnics in Ghana. The significant differences found were related to age, class and departments

JEL: A23, M00

KEY WORDS: Polytechnic, Lecture characteristics, Teaching methodology, Quality teaching, Student perception

INTRODUCTION

As part of the Ghana Educational Reform which began in the late 1980s, Polytechnics were upgraded by the Polytechnic Law 1992 (PNDCL 321, 1992) to become part of the Ghana Tertiary Education System. The Polytechnics began to offer Higher National Diploma (HND) programmes in the 1992/93 academic year. These reforms mandated the Polytechnics to complement the role of the Universities to increase access to tertiary education by training middle level manpower for the country's needs. For the last twenty years, Polytechnic education has contributed significantly to the development process of the country. The field of business has especially contributed immensely through the training of Accountancy, Marketing, Purchasing and Supply, and Management and Secretaryship personnel. The continuous training of middle-level business professionals is crucial to the success of business management since business professionals are needed for national economic growth. This holds true especially at a time when Ghana is emphasizing human resources for national development. As such, quality assurance in teaching and learning is critical for the Polytechnic's to partner with industry and thereby improve the training of business professionals. The study thus focuses on the current state of polytechnic education in Ghana in relation to teaching and learning in the business faculties as perceived by students.

One area that has received global attention in recent years in the education sector is the issue of 'teacher quality' (Entwistle and Ramsden 1987; Romainville, 1999; Hill et al., 2003; Hamid and Pihie, 2004; Abu Assan et al., 2008; Fernando et al., 2009). Different individuals, groups and organizations have expressed varying opinion with regards to what constitutes 'quality' teaching, how to develop it and the possible benefits of quality teaching. One would understand such a concern and diverse views of quality teaching and learning because of the implementation of all the policies and transformation undertaken in the education sector. A key area that determines education success is what takes place in the classroom. The

teacher is instrumental in the implementation of educational policies and reforms as entrusted to him. Such an effective and efficient implementation creates quality graduates, which in effect brings about societal growth and development.

This study is limited to one aspect of quality; that is teaching quality in the Polytechnic education. With its significant role in the education and human resources development of Ghana, managers of Polytechnics have a responsibility to improve teaching quality. The need for provision of middle-level officers to support the man power needs for economic growth and development requires that quality teaching remains a crucial success factor. Also, with the current mission of the Polytechnic education, including pursuing degree courses, demands that quality teaching is given priority. Quality teaching contributes to the introduction and accreditation of degree programs. This should not be taken for granted because, providing quality higher education by governments and school authorities, especially in developing countries, is not without challenges. Quality teaching becomes particularly significant as Polytechnics in Ghana have a duty to compete with the educational standards of their counterparts around the globe.

The rest of this paper contains the literature review, where the concept of services quality is reviewed; including quality in tertiary education. The research theory is also discussed; while data and research methodology is also dealt with. Also discussed in this paper is the results and discussion of findings. The study concludes with the summary of the work, limitations of the study, and areas for future research.

LITERATURE REVIEW

In the services literature quality is usually defined in terms of the gap between consumers expectation and how he judges services received. This is often termed 'perceived quality' (Zeithaml, 1987; Zammuto et al., 1996) This assertion is consistent with, Parasuraman et al. (1990) who indicated that consumer perceptions of service quality result from comparing expectations prior to receiving the service, and their actual experience of the service. In another development, Rowley (1996) argued that perceived quality is a form of attitude, related to, but not the same as satisfaction, and resulting from a comparison of expectations with perceptions of performance. Perceived service quality could therefore be considered the product of evaluations of a number of service encounters. In the case, of a student, this could range from encounters with office staff, to encounters with lecturers, to encounters with other students (Hill, 1995). Zammuto et al. (1996) suggested that, if an institution regularly provides service at a level that exceeds students' expectations, the service will be evaluated as high quality. On the other hand, if an institution fails to meet students' expectations, the service will be judged as poor quality. This means the degree of students' perceptions of quality teaching depend on how the teaching experiences help them to link what they learn in the classroom with real life experiences; how assignments are relevant to the real work place; how discussions lead to new perspectives of thinking; and how curriculum seek to account for students' group experiences and impact added value to students (Hill et al., 2003). According to Gronroos, (1984), predictors of quality are better determined by differentiating between quality associated with the process of service delivery and quality associated with the outcome of service, as per the judgment of the end-user after the service is performed.

One earlier definition of quality, which covers a broader perspective, is that of Parasuraman et al. (1985). They listed ten determinants of service quality that can apply to any type of service. The ten dimensions include tangibility, reliability, responsiveness, competence, access, courtesy, communication, credibility, security and understanding. The ten dimensions were then regrouped into five dimensions in what is known as the SERVQUAL model (Parasuraman et al., 1990). These dimensions include assurance, empathy, reliability, responsiveness and tangibility. This was consistent with a later study by Mahiah et al. (2006) which confirmed Parasuraman et al. (1985) suggestion, and posited that increasing of

sophistication of reliability, empathy, tangibility, responsiveness and assurance can increase customer satisfaction towards services rendered by the service provider.

Several studies have tried to conceptualize service quality in tertiary education for the last few years (Parasuraman et al., 1993; Teas 1993; Cronin and Taylor 1994; Hill et al., 2003; Hamid and Pihie, 2004; Faganel and Macur; 2005; Fernando et al., 2009). Lammers and Murphy (2002) posited lecturers' enthusiasm, knowledge in the subject, and effective classroom management as highly valued skills which interact with other physical factors such as course design to produce effective teaching and learning. Earlier studies on lecturer traits indicated that students value responsiveness and trustworthiness as major traits (Morton-Cooper, 1993). Trustworthiness included the element of reliability and consistency. Lecturer enthusiasm was also a vital trait that encouraged learning (Ramsden, 1988; O'Neil, 1995; Hill et al. 2003). A study by Rowley (1997) looked at service quality with regard to the impact of external expectations of other stakeholders including employers, governmental policy making agencies, parents, and subsequent training and learning institutions on the standards of service delivery and outcomes.

DiDomenico and Bonnici (1996) recommend measuring both student expectations and perceptions in order to expose expected versus perceived quality gaps. In the view of this study, service quality is a product of lecturer calibre and skillfully using teaching methods that deliver satisfying learning experiences. This does not mean student perceptions should be the sole consideration for defining appropriate teaching methodology and lecturers 'characteristics. Instead, service gap analysis should aid the identification of areas in teaching and learning that need modification.

Unlike previous researches, this paper posits that service quality deals with the perceived evaluation of whether service delivery equals or differs from student expectation. The study is limited to one aspect of quality; that is teaching quality in the Polytechnic education. This study measures student perceptions of service quality along two important dimensions of higher learning proposed by (Hamid and Pihie, 2004). These dimensions are Lecturers' characteristics and lecturers' teaching methodology. Based on this measurement, the study aims at developing perceived Polytechnic Business School program-service quality measurement scale (PBS-SQ).

To a achieve this, the following specific objectives are proposed: 1. To identify students' overall perceptions of the quality teaching and learning factors in the business studies programs in Ghanaian Polytechnics; 2. To identify students' perceptions of Lecturer Characteristics and Teaching Methodology 3. To examine the relationship, if any between students' overall perception of quality of teaching and learning factors in the business studies program and their demographic variables; and 4. To examine the significant differences in students' perceptions of Lecturer Characteristics and Teaching Methodology of their Course based on their demographic variables.

DATA AND METHODOLOGY

This study was adopted from Hamid and Pihie, (2004) teaching quality dimension. The dependent variable in this study is student perception that is measured by overall perception of the teaching experience. The independent variable in this study is teaching quality in Polytechnic Business Schools that measures the level of satisfaction with service performance. The dimensions included in this variable are Lecturers' characteristics and lecturers' teaching methodology.

Purposive sampling is used in this study allowing the survey to cover only business students who were in second and third years in Business Programs of the Polytechnics in Ghana. There are a total of ten Polytechnics in Ghana. Six of the ten Schools were selected for the survey. Since data was difficult to obtain the study sampled 120 respondents each from the three major Polytechnics (i.e. those with large students population, and which were established prior to 1991/1992 academic year) and 80 students each

from three of the seven smaller schools (i.e. those with small student population, and which were established during the 1991/1992 academic year). Thus, a total of 600 students were sampled from an estimated student population of about 6000.

In order to obtain the data needed for the study a questionnaire was administered. The questionnaire have three sections as follows: Section A: Demographic profile of students, Section B: Measurement constructs of students perception of Lecturers' characteristics and, Section C: Measurement of student perception of Lecturers' teaching methodology. Instrument used in this research is adapted from Hamid and Pihie, (2004) with some of the items modified; using the 5 Likert scale from 1 for 'strongly disagree' to 5 for 'strongly agree'; then revalidated by two research consultants who have experience in teaching and learning in the tertiary institutions. A pretest of the data was done in Hotel Management and Fashion departments in the Takoradi Polytechnic to confirm the validity of the instruments. The data analysis for this study involved both descriptive and inferential statistics.

RESULTS

Demographic Profile of Respondents

The response rate for the study was 86%. Babbie (1990) quoted an acceptable rule of thumb response rate of 60% as 'good' and 70% as 'very good'. Thus, the 86% response rate is encouraging. The demographic profiles of the students are age, class and department. The descriptive statistics showed 51% between 22 – 26 years; 29.5% between 17 – 21 years; and 19% having 26 or more years (Table 1). The class of students was second-year, 54.8%; third-year, 45.2% (Table 2). For departments, the profile was Accountancy, 33.3%; Marketing, 28.5%; Management & Secretaryship, 19.4%; and Purchasing and Supply, 18.8% (Table 3).

Table 1: Age of Respondents

Respondents	Responses	Percentage
17 – 22 Years	263	52
22 – 26 Years	155	29.5
Above 26 Years	98	19.5
Total	516	100

This table shows the range of ages of respondents as per the descriptive statistics generated from SPSS (version 17.0)

Table 2: Age of Respondents by Class

Respondents	Responses	Percentage
Second Year	284	54.8
Third Year	232	45.2
Total	516	100

This table shows the class of respondents as per the descriptive statistics generated from SPSS (version 17.0)

Table 3: Age of Respondents by Department

Respondents	Responses	Percentage
Accountancy	172	33.3
Marketing	144	28.5
Purchasing & Supply	100	19.0
Management & Secretaryship	97	18.8
Total	516	100

This table shows the department of respondents as per the descriptive statistics generated from SPSS (version 17.0)

Lecturers' Characteristics

The overall mean for the lecturers' characteristics construct was 3.65 and a standard deviation of 1.047, suggesting that the student perceived highly the level of Lecturers' characteristics as a whole. The means of the results from the descriptive statistics showed high scores for all variables in the Lecturers' characteristics construct. This suggests that the students were satisfaction that lecturers teaching in the business studies programs possessed, and exhibited good qualities. Individual variables in the lecturers' characteristics construct are discussed here and presented in Appendix A.

Lecturers' Teaching Skills: The findings show that overall student perception about Lecturer teaching skills is high with a mean of 3.66 (SD 0.989). Of the four variables used to measure teaching skills, the highest mean was 3.71 for the item "Lecturers are always prepared to teach". The lowest mean score was 3.61 for the other three items "Lecturers teach to students' satisfaction", "Lecturers make sure that instructions for assignment are clear" and "Lecturers stimulate students' thinking through problem solving techniques" respectively. This means that students perceive their lecturers to be skillful in their delivery. This is more likely to repose confidence in students. Although students strongly agreed that the lecturers are very skillful when it comes to teaching. There were some levels of variations in response to specific dimensional characteristics of skillfulness. This finding suggests that students perceived skillfulness on two levels, technical (structural) and professional. The findings showed that lecturers were perceived to be professionally exhibiting more professional skills but comparatively lesser technical skills.

Lecturers' Fairness: The highest mean score was 3.67 for the item "Lecturers examination questions are clear"; while the lowest mean score was 3.03 for the item "Lecturers methods of grading students are fair." This suggests that students perceive their lecturers to be fair, which is good for student-lecturer relationship. It should also minimize any feeling of inequality that usually characterizes intimidation, jealousy and uneasiness among students.

Lecturers' Firmness: Four variables were used to measure Lecturers' Firmness. The findings showed an average mean of 3.91 (SD 0.966); the highest mean score was 4.00 (SD 0.966) for the item "Lecturers ensure students meet deadlines for submission of assignment." The lowest mean score was 3.75 (SD 1.039) for the item, "Lecturers frequently monitor students behavior in class." It is conclusive that from all the factors determining Lecturers characteristics; firmness is ranked highest; indicating that students perceive their lecturers to be very firm relative to other factors.

Lecturers' Helpfulness: Again four variables were used to measure Lecturers' helpfulness. The findings showed an average mean of 3.56; the highest mean score being 3.68 (SD 1.067) was for the item "Lecturers are willing to help students"; while the lowest mean score was 3.45 for the item, "Lecturers ask follow-up questions, and allow more time for response." This finding suggests that though students on average perceive that their lecturers in the business studies programs are very helpful, they are somehow indifferent \ at the level of constructiveness of help that is received.

Lecturers' Teaching Methodology: The results showed an overall mean for Teaching Methodology of 3.68 (SD 1.067). This is an indication that the students in the business program expressed high agreement that they experienced quality Teaching Methodology. The findings in this quality factor were reported according to three constructs: Extemporaneous delivery, Logical development of materials and Use of appropriate illustration/examples.

Extemporaneous Delivery: The highest mean score for this construct was 3.88 for the item, "Lecturers use simple language that students can understand" while the lowest mean score was 3.32 for the item, "Lecturers teach without necessarily reading from written notes. Comparing the highest mean score with

the lowest, it can be seen that the study seems to suggest that students perceive lecturers as delivering their lectures with naturalness rather than being artificial.

Logical Development of Material: The study showed high levels of quality in the logical development of materials for teaching in the business programs in the Polytechnics in Ghana. This is illustrated by an overall mean score of 3.58 (SD 1.046). Four variables were used to measure this construct. The highest mean score was 3.75 for the item "Lecturers follow planned lesson programs, while the lowest mean score was 3.42 for the item, "Lecturers begin each lesson with a review of the previous lesson". In between the two extremes, we have means scores of 3.66 and 3.48 for items, "Lecturers specify the learning objectives for every lesson" and "Lecturers vary the pace of instructional activity respectively. The study suggests that students enjoy quality teaching material in a logically developed manner. This notwithstanding, the two extreme mean scores suggests that students expect their lecturers to provide additional review of previous lessons to draw a better and clearer linkage between lessons for better understanding

Use of Appropriate Illustration/Examples: Students perceive the extent of use of appropriate illustrations and examples in teaching as high. The average mean score from students' respondents was 3.33 (SD 1.143). The highest mean score was 3.66 on the items " Lecturers provide suitable examples, demonstrations and illustrations of concepts and skills"; and the lowest mean score was 3.06 for the item "Lecturers incorporate experiential learning e.g. field trips, simulation etc. in their teaching". This indicates that although the business program in Ghanaian Polytechnics heavily emphasized research work, they give relatively lower attention to hands-on practical fieldwork.

*F- Ratio and ANOVA:*The F ratio showed no significant difference in the perception of students in Business Programs in Ghanaian Polytechnics on quality of Lecturers' Factors and Teaching Methodology as a whole. The overall results were ($F = 1.50$ $p<.34$) for Age; ($F = 1.34$ $p<.43$) for Class; and ($F = 1.49$ $p<.37$) for department. The result is similar for the relationship of these variables with Lecturers' Factors and Teaching Methodology. For Lecturer Characteristics, the findings showed ($F = 1.61$ $p<.34$) for age; ($F = 1.40$ $p<.45$) for class; and ($F = 1.49$ $p<.37$) for department. The results for Teaching Methodology were ($F = 1.35$ $p<.35$) for age; ($F = 1.26$ $p<.41$) for class; and ($F = 1.33$ $p<.32$) for department respectively. This indicates that on the whole students agreed that there is high quality teaching and learning.

On the individual variables, however, the results indicate some significance differences. For example, the items, "Lecturers give freedom to students to choose their own group mates" and "Lecturers respect all students regardless of who they are", and "Lecturers follow planned lesson program" were significant with age ($p<.032$; $p<.008$; and $p<.045$) for age 17 – 21; 22 – 26; and above 26 respectively. The mean scores showed that more students above age 26 agreed that their lecturers give them freedom to choose their own group mate; while more people in age 22 – 26 believe that lecturers respect all students without discrimination; and also that lecturers follow planned program during lessons. This suggests that older students are given more freedom to provide input into issues affecting them. Furthermore, older students are less appreciative of the lecturers planned lesson program.

Again, different classes were found to have varying perception with regards to quality of Lecturers' Factors in two items. The ANOVA results indicated a significant difference in students' perception; $p<.041$, and $p<.001$ for items, "Lecturers are willing to help students" and "Lecturers use various teaching methods that help students to understand the subject" respectively. The mean sores indicated that more students in second year expressed strong agreement for these variables compared to those in third year. This implies that as the students climb the academic ladder they tend to have higher expectations of lecturers. Again, they expect lecturers to use varying methods to enhance teaching and students' understanding.

The ANOVA results revealed that there were significant differences in students' perception in both Lecturers' Factors and Teaching Methodology for different departments. For the Lecturers' Factors, the ANOVA results was p<.000 for the item, "Lecturers respect all students regardless of who they are"; and for the Teaching Methodology, it was p<.016 for the item, "Lecturers use simple language that students can understand. The mean score revealed that, compared to the other departments, more people in Accountancy perceive their lecturers to respect all students without discrimination. This suggests that lecturers in Accountancy departments demonstrate a higher sense of respect than those in other departments, or students in other departments expects too much of their lecturers with regard to respect. Similarly, relative to other departments, Management and Secretaryship students believe strongly that their lecturers use language that is simple and understandable.

DISCUSSION

This study focuses on one aspect of quality in tertiary education, which is quality teaching and learning. Lecturers are important stakeholders in tertiary education as agents of change toward the achievement of the objectives of the educational reform. This is especially true when it comes to issues relating to what takes place in the classroom. In this respect, lecturers as service providers in the Polytechnic education, are under constant scrutiny as having the responsibility for improving service quality. Since what takes place in the classroom is crucial in the assessment of service quality, quality teaching has been identified as an important antecedent to success. As assessment of quality becomes more pronounce, students as end-users must be satisfied.

With its significant role in the education and human resources development of Ghana, managers of Polytechnics have a responsibility to improve teaching quality. The need for the provision of middle-level officers to support the man power needs for economic growth and development requires that quality teaching remain a crucial success factor. This should not be taken for granted because, providing quality tertiary education by governments and school authorities, especially in Polytechnic education, is not without great challenges. Quality teaching becomes particularly significant as Polytechnics in Ghana have a duty to compete with the educational standards of their counterparts the world over.

Literature on quality suggests that quality as a concept is hardly measurable; however, it is recognizable by academics when and where it exists. Quality is said to mean different thing to different people based on their individual or group interests. Thus, it is conclusive to say that quality is not only multidimensional but also, often a subjective concept. Therefore, lecturers of Polytechnics could provide quality teaching only if they understand the needs and expectations of their students. Lecturers could better do this by identifying quality attributes as considered by these students since quality is perceived differently. This is consistent with Owlia and Aspinwall (1996) who suggested that in order to measure quality, characteristics of the quality need to be identified. Additionally, Cheng and Tam (1997) emphasized on the importance of defining characteristics of quality for the measurement of the education process.

Based on our finding to develop perceived Polytechnic Business School program-service quality measurement scale (PBS-SQ) the research objective has been met. The study indicates that lecturers regularly provide service at a level that exceeds students' expectations, hence service is evaluated as high quality Zammuto et al. (1996). This research serves as a tool that offers students an equal opportunity to provide general feedback on their perception of quality in their learning experience. Student feedback will be able to provide the Polytechnic Business School with comparative information that can be used to assist them in the identification of strengths and weaknesses of the service quality provided, as perceived by the students. Student's overall perception and evaluation of quality service help to describe a variety of educational activities such as teaching methodology, lecturer-student interaction, lecturers' firmness, lecturers' fairness and lecturers' helpfulness.

Furthermore, the Business Schools should be able to identify gaps between students' perceptions of quality teaching and that of Polytechnic authorities. Moreover, policy makers should be able to establish gaps between policy planning and implementation outcomes. The importance is to aid the authorities of Polytechnic education to overcome the misconception that is often associated with appreciating students' attitudes due to the subjective nature in which students' comments are received. The findings of the study should also go a long way to aid Polytechnic authorities in the direction of introducing degree programs. At the same time it should provide a feedback for accreditation of degree programs.

CONCLUDING COMMENTS

This study was carried out to examine the quality of teaching and learning in Business School (HND) Programs in Polytechnics in Ghana. The findings indicated that students in the Polytechnics have high perceptions of the quality of their Lecturers, and the Teaching Methodology employed in the program. No significant differences were found in the four constructs and, three constructs that that were used to measure quality of lecturers' characteristics and lecturers' teaching methodology respectively. This indicates that quality teaching and learning were judged high in all constructs. However, significant differences were found in some individual variables of the constructs with regard to age, class and department. The findings of this research are consistent with some of the earlier research regarding quality in higher education (Hamid and Pihie, 2004; Abu Hasan et al., 2008; Fernando et al., 2009)

The study sampled only Business School students in second and third years of their study, which makes the sample size small and limited. As a result, it is difficult to generalize the results to students of other Programs or faculties of the Polytechnic. Also, the ability to draw conclusions regarding students in other schools is limited. In addition, evaluations of educational quality by other stakeholder perspective would be worthwhile. Using only a single stakeholder view to measure educational quality gives a limited focus. Furthermore, the study ignored gender which could have been an important demographic variable. Future studies could address these important issues. Finally, the study is basically quantitative and hence could not ascertain in-depth issues. Thus, more in-depth and qualitative studies need to be carried out to examine details pertaining to the differences of perceptions.

APPENDICES

Appendix A: The Mean Scores

Descriptive Statistics

	N	Min.	Max.	Mean	Std. Deviation
Age in completed years	516	1	3	1.90	.689
Class of student	516	1	3	1.45	.502
Student's Department	516	1	4	2.24	1.114
Lecturers teach to students satisfaction	516	1	5	3.61	.984
Lecturers make sure instruction for assignment are clear	516	1	5	3.69	1.003
Lecturers are always prepared to teach	516	1	5	3.71	.971
Lecturer stimulate student thinking through problem solving	516	1	5	3.61	1.000
Lecturers examination questions are clear	516	1	5	3.67	1.034
Lecturers methods of grading students are fair	516	1	5	3.03	1.225
Lecturers give freedom to students to choose group mates	516	1	5	3.66	1.213
Lecturers respect all students irrespective of who they are	516	1	5	3.50	1.183
Lecturers ensure peaceful environment in clas	516	1	5	3.95	.912
Lecturers ensure students meet deadlines for submission of assignments	516	1	5	4.00	.966

Descriptive Statistics					
	N	**Min.**	**Max.**	**Mean**	**Std. Deviation**
Lecturers stop inappropriate behavior in class	516	1	5	3.92	.953
Lecturers frequently monitor students behavior in class	516	1	5	3.75	1.039
Lecturers provide feedback that encourage students' progress	516	1	5	3.47	1.099
Lecture rs ask follow-up question and allow time for response	516	1	5	3.45	1.045
Lecturers are willing to help students	516	1	5	3.68	1.038
Lectures use various teaching methods to help students' understand	516	1	5	3.64	1.085
Lecturers teach without necessarily reading from notes	516	1	5	3.32	1.215
Lecturers deliver with confidence and enthusiasm	516	1	5	3.82	.900
Lecturers use simple language that students can understand	516	1	5	3.88	.924
Lecturers communicate proficiently	516	1	5	3.67	.933
Lecturers begin lessons with review of previous lesson	516	1	5	3.42	1.159
Lecturers follow planned lesson program	516	1	5	3.75	.990
Lecturers specify the learning objectives for each lesson	516	1	5	3.66	1.060
Lecturers vary the pace of instructional activities	516	1	5	3.48	.976
Lecturers provide suitable examples, demonstrations and illustrations	516	1	5	3.66	1.029
Lecturers incorporate experiential learning	516	1	5	3.06	1.192
Lecturers introduce students to use of case study to solve problems	516	1	5	3.28	1.208
Valid N (listwise)	516				

This table shows the means scores and standard deviation as per the descriptive statistics generated from SPSS (version 17.0)

Appendix B: Questionnaire Construct

Please tick (√) the appropriate response in an honest and frank manner.

Respondent Profile

1. Your age in completed years.
   17 – 21 { }; 22 - 26 { }; Above 26 { }

2. Your Class.
   Second Year { }; Third Year { }

3. Your Department.
   Accountancy { }, Marketing { }; Purchasing & Supply { }; Management & Secretaryship { }

Lecturer Teaching Skills	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
4. Lecturers teach to your satisfaction when presenting their lessons					
5. Lecturers make sure that instructions for assignments are clear					
6. Lecturers are always prepared to teach					
7. Lecturers stimulate students' thinking through problem solving techniques					
Lecturer Fairness					
8. Lecturers' examination questions are clear					
9. Lecturers methods of grading students are fair					
10. Lecturers give freedom to students to choose their own group mates					
11. Lecturers respects all students regardless of who they are					
Lecturer Firmness					
12. Lecturers always are able to ensure peaceful environment in class for smooth learning					
13. Lecturers ensure that students meet deadlines for submission of assignment.					
14. Lecturers stop inappropriate students' behavior promptly and consistently					
15. Lecturers frequently monitor the behavior of students during class					

Lecturer Teaching Skills	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Lecturer Helpfulness					
16. Lecturers provide feedback that encourage students' progress					
17. Lecturers ask follow-up questions, and allow more time for response					
18. Lecturers are willing to help students					
19. Lecturers use various teaching methods that help students to understand the subject					
Extemporaneous Delivery					
20. Lecturers teach without necessarily reading from a note					
21. Lecturers deliver their lectures with confidence and enthusiasm					
22. Lecturers use simple language that students can understand					
23. Lecturers communicate proficiently					
Logical Development of Material					
24. Lecturers begin each lesson with a review of the previous lesson					
25. Lecturers follow planned lesson program					
26. Lecturers specify the learning objectives for every lesson					
27. Lecturers vary the pace of instructional activities					
Use of Appropriate Illustration/Examples					
28. Lecturers provide suitable examples, demonstration and illustrations of concepts and skills					
29. Lecturers incorporate experiential learning e.g. field trip, simulations etc. in their teaching					
30. Lecturers introduce students to the use of case study solve problems					

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THE SKILL SETS REQUIRED FOR MANAGING COMPLEX CONSTRUCTION PROJECTS

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ABSTRACT

Very few projects comprise the unique character that construction projects have. The product from construction processes are rarely similar with each having unique set of characteristics and qualities that set them apart from other projects. Hence the management of the production processes demand creative and often times imaginative managers for the achievement of successful outcomes. Undoubtedly complex projects will need to be resourced with the right calibre of managers because they are a higher order management activity. But what is the skill sets required of this calibre of managers? The paper reports on the perspective views of some senior management personnel in construction organizations on what constitutes complexity in construction and what skill sets will be required to achieve successful outcomes on those projects. Their views were obtained through semi-structured interviews. The responses are analysed descriptively with thematic summaries. The paper concludes that there are specific skill sets that are set apart for success on complex projects, and that the skills evolve from knowledge gained from exposure to a wide range of projects.

JEL: L74; M00

KEYWORDS: Project Manager, skill set, complex, construction project

INTRODUCTION

Construction is similar to other production-related industries, in that it follows the wheel of advancement and technology. The increasing demands of the construction industry to make the world a better living place for people has established it as a frontier of an ever advancing world. As a result construction projects are considered with wider perceptions, with project objectives requiring more extensive efforts. Globalization and healthy competition have played a key role in driving the industry to the limits. The industry is trying to pace up with progressively growing demands, varying needs and objectives. Therefore projects of sheer size, novel shapes constructed using innovative materials, methods and technologies have become normal. Projects undertaken in the Middle East during this early century are classic examples of the radical requirements for cutting edge performance by the industry. In probably similar developmental moves, the industries' clientele have become more business-minded and now set project objectives and deliverables that could be considered complex to achieve.

This complex, demanding, and dynamic requirements call for project managers that can manage the construction process from inception to successful completion (Leung, et al., 2009). Financial and reputation issues of construction organizations are now dependent on the project managers assigned to handle these projects. The consequences of a mismatch of skills and project complexity could lead to loss of control and monumental failure of these projects. Failures of projects like the Holyrood parliament building and the Sydney Opera house have raised concerns among industry and substantiated under-performance in the construction industry. Conversely success on projects such as the Burj Al Arab, Dubai Tower, Bahrain Twin Tower, Palm Island and World Island projects etc. highlight victory of skills, knowledge and competencies over prevailing industry issues and concerns.

Conventional and traditional approaches to managing projects may not suit complex projects. Several authors agree that complex projects are like systems and should be addressed systemically and many of them found that the methodologies on controlling systems thinking alone are not suitable for today's projects (Remington and Crawford, 2004; Williams, 2002; Checkland, 1999; Baccarini, 1996). In order to have successful outcomes, project managers should adopt both a system and pluralistic approach with multi ways of thinking. Project managers must draw from a wide range of tools and skills and think in different ways; unconventionally create new methods to suit their projects and the problems they deal with. Managing a complex projects require different approaches and different mentality. Complex projects are a higher-order management activity and should be treated and resourced accordingly (Remington, and Pollack, 2007).

Therefore there has to be awareness on the skills required for different type of construction projects. This paper attempts to identify these skill sets particularly for complex construction projects. These skill sets are viewed from the perspectives of some survey participants, who begin by presenting their understanding of complexity in construction projects. In the next section a brief review of literature on construction project complexity and the functions and skills of construction project managers is undertaken. This is to give contextual background to discussions in the remaining part of this paper.

LITERATURE REVIEW

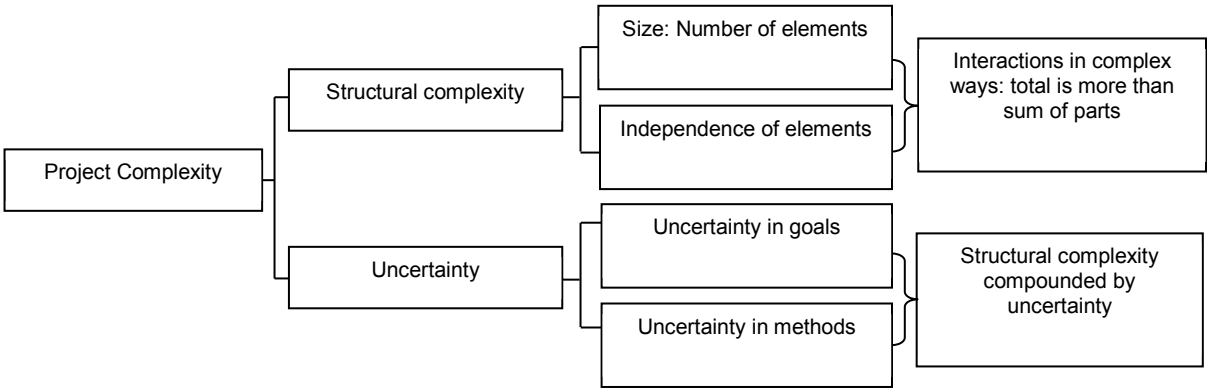
Project complexity is viewed differently by different scholars in the field. However the Centre for Project Management (CPM) in California gives a useful categorization that explains what constitutes complexity in construction projects. Four project types with varying complexities are identified by the centre to include: simple, organizationally complex, technically complex and critical mission projects.

Simple projects are projects which do not require much skills as most of these types of projects are repeated. They do not pose difficult challenges for project managers and most of the times have successful outcomes. The CPM concludes that these type of projects are better suited to new project managers, to start to build their excitement and interests for future projects. Organizationally complex types of projects are structured using a current and known technology, but the complexity is due to the new organizational environment, which could impact on an organization's functions and business decisions. Sometimes the projects could involve a combination of two or more new initiatives and processes. The challenge for the project manager on this project type is to decide the best way and which one to tackle first, whilst also contributing to the business in a proactive way.

Technically complex projects are essential for organizations but are characterized more on their technical complexity than on their organizational value. Technical complexity could appear in different ways. In some cases the technology is new and unknown to the organization or at least there are a small team of professionals that could understand it. Involvement in these types of project is very risky and could lead to disasters. On the hand the projects may involve new technology known to the organization but for which there is no qualified person/ project manager to manage. As this type of project could involve multi changes and complications during its lifecycle, requiring new way of thinking and adopting new ideas alongside the project; the changes could be critical to success. The projects will require special skills and techniques in order to succeed in the mission. Finally critical mission type of projects, require a high quality of performance from project managers for both organizational and technical complexities as these projects are very significant to a business. In some cases organizations struggle to change the scope of the work to suit the changes happening every year, trying to cope with it and stay in line with new technology and be prepared for it. Obviously, this means a lot of work behind the scene and a lot of preparation for good and solid base ready to attack and thrust through the new and complicated projects.

Williams (2002) explains that overall project complexity is characterised by two dimensions: structural complexity and uncertainty. Figure 1 shows that structural complexity further depends on number of elements and independence of elements. Uncertainty in goals and methods is another dimension which makes the project complex. Each of these dimensions has two sub-dimensions as shown in Figure 1. Bertelsen (n.d) states that complexity in construction can no longer be ignored and that the basis for project management paradigms should thus be redefined. This is the real challenge!

Figure 1: Dimensions of Project Complexity (Williams, 2002)



The figure gives the main character of complex projects as those resulting from the project structure or from uncertainties around the project. Each of these two characters is further broken down to size and independence of the project elements; and uncertainty in project goals and methods, respectively.

Different types of projects need different types of project managers. Complex projects need project managers that are equipped with special skills to achieve successful outcomes. Complexity in the system does not require complex management but needs project managers with open minds and thinking outside the box. The projects need some initiatives from project managers to create and produce things that are outside their job description. The most efficient project managers should be able to decompose the apparent complexity of the project situation in order to view it more simply. With great occurrence, projects are becoming cross-functional and progression-related and require personal skills and knowledge, interpersonal, and general management skills. This means that project managers should have knowledge and understanding about the business process. If the project manager is working in an environment that is supportive, it is a fortunate, if not it simply means being more self-reliant. Project success must be the main concern for any project manager and they have to be prepared for the battle.

The primary skill expected from a project manager is to have "good people skills". It is very obvious and true that project managers deal with different types of people, trades and attitudes throughout the project lifecycle. The project manager takes the responsibility of the project and the process. They receive the blame or the praise at the end of the outcomes. They manage all the people but they do not have any authority over them, therefore, they have to have enough skills to influence the team and make them do what they plan to achieve. They have to persuade, negotiate and sometimes even have to beg to get things done. Thus interpersonal skills are required to be at the top of all skill requirements. Henry Ford says,

"Coming together is a beginning. Keeping together is progress. Working together is success."

According to Wysocki and Lewis (2001) project manager's attributes vary from being a barrier to the rest of the organization to having visible leadership. Table 1 provides a listing of attributes expected from project managers. As shown in the table there are only few features which are related to technical and administration aspects of project management, while the rest are inclined towards people management. This shows that people skill is important in most situations because project managers are leaders and

leaders have to effectively get people to follow their instructions and fulfil their goals. Two main types of leaders are in existence: those leaders that are more people oriented and those which lean towards task orientation. How the project manager balances between the two without affecting the project outcomes is the real challenge for a project manager.

Table 1: Attributes of Project Managers

Attributes of Project Managers	
Buffer to rest of organization	Knows strength and weaknesses of team members
Challenges team to do well	Mutual ownership
Clears road blocks	Mutual respect
Delegates	Open minded
Fair	Organized
Follows up	Sense of humour
Gives feedback	Shares experience
Good decision maker	Supportive
Good listener	Team builder
Honest and trustworthy	Understanding
Knows own limitations	Visible leadership

The table gives a list of attributes expected from a project manager. Few of the attributes relate to technical and administration aspects of project management, while the majority relate to people management. The list shows the relative importance of people skills in project goal achievement.

In order to be effective in given tasks a project manager has to achieve project objectives and build a good relationship with his project team, meet client expectations and at the same time maintain the organization's profit motives. Méndez-Morse (1992) concludes that effective leader's behaviours have been categorized along two common dimensions: initiating structures (concern for organizational tasks) and consideration (concern for individuals and interpersonal relations". Having effective interpersonal relation (the ability to create good relationships between oneself and other people) that includes problem solving, decision making, and conflict resolution, are part of a project manager's responsibility. As a team leader the focus is limited to internal and within-team objectives but as a project manager the focus is more external, to see the whole picture and deal with all aspects/factors that could interfere with a project from the outset till completion.

Project success is related to the deliverables, main drivers and objectives of any project. Success is measured by achieving what has been planned. Project success is defined as the satisfaction of stakeholder needs and measured by the success criteria identified and agreed at the start of any project (APM). Alternatively project success could be defined as a "collective assessment by project stakeholders (e.g. client/customer, sponsor, contractors) of the degree to which the project has achieved each of its objectives" (Project Manager Competency Development Framework). It is about blending all facets of success together to make a coherent whole (Abeysekera & Mclean, 2001).

$$\text{Success} = \sum (\text{Achievements of objectives})$$

Project success is dependent on factors such as planning, monitoring and controlling, team selection, technical performance, communication, leadership, strategic direction, team development, risk management (monitoring and controlling), organisational support, stakeholder management, organizational structure, and project definition (Crawford, 2000). Hartman and Ashrafi (2002) provide another useful dimension to project success through a description of 10 factors that could contribute to project success. These factors are given in Table 2. Project managers are expected to be leaders and be able to achieve balance between tasks and people, according to project situations and other factors and constraints. The term leadership is defined as the "art of getting others to do something that you believe should be done" (Packard cited in Lewis, 2002). Several key skills have been identified as attributes of good project management leadership. They include persuasion, people skills, self-confidence, project ownership and planning skills. These skills are briefly described in the following paragraphs.

Persuasive skills are an interactive process which inspires followers to achieve their leader's vision. It is the art of communication and meaningful language. Persuasion is a "generic name for a variety of communication skills and techniques that have as their purpose altering another person or group to the leader's point of view" (Fairholm, 2003 p. 185). Project Managers have to persuade people towards the achievement of successful outcomes. The Harvard Business School explains that credibility which is trust plus expertise, understanding of the audience, solid argument, and effective communication are the four elements that persuasion consists of.

Table 2: Project Success Factors

Success Factors	Description
Project Mission	Clearly defined goals and direction
Top Management Support	Resource , authority and power for implementation
Schedule and Plans	Detailed specification of implementation
Client Consultation	Communication with and consultation of all stakeholders
Personnel	Recruitment, selection and training of competent personnel
Technical Tasks	Ability of the required technology and expertise
Client Acceptance	Selling of the final product to the end users
Monitoring and Feedback	Timely and comprehensive control
Communication	Provision of timely data to key players
Troubleshooting	Ability to handle unexpected problems

The table provides a description of ten factors that could contribute to success on any project. These ten factors show a balance between functional tasks and the management of people, both internal and external to an organisation.

Personality and people skills are more effective sometimes when an informal approach is adopted to get into the heart of people and share their feelings and make them feel part of one big family that are cared for. According to Collins and Lazier (1992) effective leaders master the paradox of both hard and soft management. They hold to incredibly high standards of performance (hard) yet they go to great lengths to build people, make them feel good about themselves and about what they are capable of achieving (soft).

Fisher (2010) outlines six people skills required of effective leaders. The first being the ability to understand other peoples behavioural characteristics. The ability to be genuine, open and honest with others develops an understanding relationship. Secondly, effective leaders should be able to lead others through their good leadership styles. Effective leaders should hold the power of influence, impressing others to support an agenda. Fourthly, effective leaders should have an authentizotic behaviour. They should be able to accept people for what they are and do not try to force them to change. Fifthly, effective leaders should have conflict management skills that would enable them establish the root causes of conflict and deal with the conflicts decisively. Finally effective leaders need to be culturally aware. They should develop and apply an awareness of the cultural differences of their team members.

Self-confidence is one of the fundamental and effectiveness requirements for project managers. Leaders without high self-confidence are unable to take the right decisions and to solve conflicts that could arise amongst their staff (Bass, 1999; Boyatzis, 1982 and Paglis and Green, 2002). Also leaders with high self-confidence are more likely to attempt complex tasks and to set challenging objectives and take more initiative to deal with problems.The feelings of project managers towards their projects play a vital role in project success. It is like a relationship between two partners sharing all the good and bad times together. Similarly on construction projects a project manager should be proud and feel that the project is part of him/her. That feeling is not easy to be achieved and it will not be there if the project manager misunderstands the project and its objectives. Therefore understanding every element of the project, and building a gradual relationship with the project, a manager feels that he cannot go away from the project until achieving the goals. Project managers should live the vision throughout the project life cycle. At the end it means that the project manager is taking care of every step and every activity on site; in other words the manager is taking ownership of the project. Project ownership is another fundamental skill which takes the project manager to the ultimate level of thinking and management. It is essential for new

project managers when they start their career life working with senior project managers to think about this and start to build that feeling. After a while and after involving in few projects, it will become a part of their personality and another source of energy and motivation to drive projects and recharge the battery when it is needed. It is one of the skills that once it is gained, it stays. Complex projects require that project managers have a sense of ownership or feeling. Project managers need to be in a situation that they feel they are part of the project and they will see and forecast the problems before or at least they will be ready for it to find the proper ways to deal before they impact negatively on projects. Taking the ownership of project stays even after project completion. It is common for project managers to refer to their old projects, they lay claim on completed projects as if it is still theirs forever. They will talk about every moment they spent solving issues and other difficulties they faced; and proudly explain how successful the outcomes were. Where the outcomes were negative, they are quick to explain what lessons were learnt from it. The last project manager's skill relates to the abilities to plan and schedule activity performance. Planning is a primary element which is required to ensure a project is following the right path towards set goals. It is not just to schedule time for tasks or activities, but it involves understanding the project elements and its structure, and how the building or the structure is going to be put together.

Project managers need to be able to decompose projects so that they see the whole project specially the complex project into small subtitles or work breakdown structures. This will allow them to allocate the right resources to each activity and the duration required. Team members would be aware of what is required from them at each stage of the project lifecycle, mainly at the execution part of it. Clearly this shows how the project manager is keeping control of the process and he will be able to modify or overlap these activities as needed. The foregoing has outlined the project management function and its skill requirements. The following section covers the data collection aspects of the study by first describing the study methodology, then presenting the study findings within the context of this papers objective.

DATA AND METHODOLOGY

The objective of this study is to determine the skill sets needed by project managers for managing complex construction projects. The approach therefore used for the study was semi-structured interviews as the primary tool in identifying the project complexity factors and the skills required of project managers. Interviews were conducted with five senior management level personnel in five construction organizations in New Zealand. For reasons of anonymity the five interviewees are referred to as interviewees A to E (IA, IB, to IE respectively).There were 10 key questions asked which captured the perspective views of the Interviewees on their understanding of complexity in construction projects and of the skills required to manage this category of projects. The constituent questions in the semi-structured interview are given in Table 3.

Table 3: List of Interview Questions

No	Interview Questions
1	How would you describe complex projects from your organization's point view?
2	How many types of complex projects has your organization been involved in?
3	What sort of preparation would you put in place for this type of projects in your organization?
4	What skills would you expect your Project Managers to have, in order to manage these type of projects?
5	What sorts of training or tools are available to Project Managers in your organization to equip them for complex projects?
6	Can you give examples of these projects and what were the lessons learnt from their management of it?
7	Do you believe and expect that every Project Manager should be capable of managing a complex project?
8	What criteria were used for selecting the Project Managers engaged for your complex projects?
9	Do you believe that traditional management approaches are applicable in complex projects?
10	Could you identify (in three words) what you will consider as the most important skills that a Project Manager will need for successful outcomes on a complex project?

The table gives a list of the ten questions that was asked of the five senior management personnel in the five construction organisations used for the study. The objective of the interview was to determine the skill sets needed by project managers for managing complex construction projects.

RESULTS

From the range of questions asked from the Interviewees about their understanding of complexity in construction projects, it was possible to generate thematic summary of their responses. The responses are summarised in Table 4.

Table 4: Descriptors of Construction Complexity

Interviewees	Complexity Descriptors
IA	Undefined and unclear project scope
	Type of people being dealt with (project participants)
	Technicality of the project (especially where not properly defined) that could create unique management challenges.
IB	Complexity of clients' requirements/brief
	Complex requirements and obligations that cannot be realistically implemented through to completion
	Requirements for project staging and hand-over
IC	Difficult construction sequencing
	Staged handovers or staged access or milestones
	Uncommon features and building elements
	Unavailability of clearly defined documentation
	Political issues around clients and project participants
	Projects with large fluctuations in the management team requirements to deliver them.
	Unusual structure, space and geometry (Construction is irregular)
	Incomplete designs (too many unknowns before execution)
ID	Technical requirement (requiring know how)
	Cultural differences and perceptions
	Project duration and project timing (sequencing)
	Architecturally challenging
	Project location and resource availability
	Lack of construction details
IE	Large number of stakeholders (and probably varied)
	High levels of risks (technical, program, quality, client etc.)

The table gives a list of the descriptors of complexity as provided by the five senior management personnel in the five construction organisations that were interviewed for this study.

The responses show that complexity of construction projects depend on a number of diverse issues which could develop throughout the project life cycle from conception to its commission and beyond. A recurring theme from the responses is the technicality of construction requirements stemming from complex clients briefs for projects with very unusual structure, space, and unusual geometry. Another salient issue connected with project scope is the uncertainty resulting from incomplete designs as at the time physical execution has commenced on the project site. It is not unusual for design development to progress into the construction phases of projects but complexity comes from changes that may be brought about by scope changes that could affect completed sections of the works.

One of the Interviewees explained that on a particular project they had the design running parallel with the construction. Staging was therefore complicated. Consultants were required to issue a package of full instructions and documents for the next stage of building, every two or three months during construction. The consultants were late with their information and the clients still wanted their building on time. The delay by the consultants made the physical progress squeezed up all the way through. Similarly the content of the contractual agreements may allow for loosely defined scopes which are continuously or persistently modified to the detriment of the constructors. This is exacerbated further by difficulties that are associated with the processing of variations. Complexity could also result from the dynamics of the construction supply chain (the project team). Proper project team integration expectedly should ensure smoother flow of operations but this is rarely the case and projects become difficult to manage. Team integration is more difficult with larger teams, each with varied interests and performance motives. One of the Interviewees alludes to the complexity of the managing relationship that existed between his construction company, the client and the project management company on one of their projects. In his

words, '*they were never quite sure who was in charge*'. In another situation a public sector project became complex to manage because there were too many stakeholders and it became highly politicised.

From an organization's point of view, complex projects are projects that have large fluctuations in the management team requirements. The project might start with a few persons and then step up to requiring a larger team because there are a lot of activities taking place simultaneously and then it drops away again. These changes in work sequence impacts resource levels which in turn makes operations difficult to manage.From these responses, it could be suggested that complex projects do not necessarily need to be large projects. For example replacing the roof from an inhabited building could become complex.

Complex projects require additional efforts and thinking beyond the normal green field sites. On international projects it could be the cultural differences, knowledge of local people and work conditions that could make them complex. From the responses, the factors contributing to project complexity were further regrouped into seven main factors and presented according to their thematic frequency. Table 5 gives the percentage contribution of each of the seven factors. The Table shows that technical, buildability and architectural challenges is a chief reason (25%) for complexity in construction projects. This is followed by the size and staging of projects (20%). Factors such as poor documentation and insufficient details and drawings; uncertainty; and involvement of many clients and stakeholders are other significant factors that account for construction complexity.

Table 5: Distribution of Factors Influencing Complexity in Construction Projects

Complexity Factors	Contribution (%)
Uncertainty	15
Poor documents and insufficient details and drawings	15
Technical and buildability and architectural challenges	25
Size and staging of the project	20
Client and stakeholders	15
Cultural	5
Organizational	5

The table gives the percentage contribution of a list of complexity factors presented to the Interviewees. The results show that Technical and buildability and architectural challenges is the chief factor; while factors such as cultural and organizational complexity are the least factors that account for construction complexity.

The second set of questions in the semi-structured interviews was focussed on determining the skill sets that were necessary for successful outcomes on complex projects. The interviewees had described what they understood complex projects to mean, they were then required in this section to explain what type of project managers they felt could handle these complex projects. Similarly, thematic analyses of the interviewees' responses were undertaken, and a summary of their responses is tabulated in Table 6. The skill sets identified by the interviewees in the Table 6 have been condensed into four key skill sets which a capable project manager should have for successful outcomes on complex projects. These four skill sets are presented in the Table 7.

The table shows that communication, people skills and leadership abilities; good visions and focus on the end results; planning and risk management skills; and finally technical skills and experience are all important skills for a project manager. Each of the skills is adjudges 25%. By implication, no one skill is dominant in its requirement for successful outcomes because they all have equal status. The planning skill covers a whole range of planning requirements such as planning for project risks, time management, planning for quality achievement, health and safety planning etc. According to one of the Interviewees, 'it is not just about programme of works, but it is about putting a plan in place for all the different things involved in the project execution'. These skill requirements are explained further in the discussion section to put them in perspective.

DISCUSSION

From the result of the study findings, one can reach a conclusion that construction project managers need to be focused, be good leaders and communicators and that they need the capacity to understand the complexities of the project under their control. Explicitly also is the need for the project managers to be forward-thinkers so that they are able to leave through a project in advance, anticipating all operational bottlenecks before they occur.

Table 6: Skills Required by Managers of Complex Projects

Interviewees	Project Manager's Skills for Complex Projects
	Communication and people skills
IA	Project management knowledge and experience
	Be visionary and plan for its achievement
	Good focus on the end results.
	Clear vision.
IB	Good leadership skills
	Good communicator with all stakeholders and operational staff
	Good technical knowhow on how to put all the project puzzles together
	Good focus
	Good leadership skills,
	Good communicator
IC	Knowledgeable and with the required capacity to understand the complexities of the project.
	Excellent negotiation skills
	Excellent people management and motivation skills.
	Able to delegate and relate to people
	Highly developed technical skills and able to understand project deliverables
	Good understanding and ability to see how the completed project should look.
	Able to forecast project buildability and the process needed to achieve this
	Need to have clarity and people skills
	Able to manage performance
ID	Empathetic team leader, who provides practical support to his team
	Ability to maintain flexibility
	Leadership and good people skills
	Strong desire for getting things done and motivate the team
	Ability to plan projects logically
	People management skills (as the captain of the team)
	Good communication skills
IE	Forward-thinker and be able to look well ahead for risks/problems in advance
	Strategic visioner
	Ability to make others accountable for their performance

The table gives individual responses of the five Interviewees to the skills required of project managers on complex construction projects.

A complex project requires strong and committed leadership that will get the operational team to perform to project expectations. Although the bigger the project the lesser is the project manager's involvement with the nuts and bolts of what is going on. Nonetheless the project manager will be expected to delegate and motivate the right calibre of support personnel that will deal with the nuts and bolts of the project. One of the interviewee puts the leadership and people skill set more succinctly, when he asserts that every person who comes through the project manager's door needs to be managed and possibly treated accordingly. This could be the client, the project consultants, subcontractors, and sometimes the project manager's own personnel. All these needs must be met using different approaches from subtle to more rigid and non-compromising stance. This particular skill sets derives from experience which often times cannot be taught in schools. Another interviewee explains that the objective of their organisation is to gradually introduce the young project manager to different job demands. This exposes the project manager to different types of skill sets requirements that will mature over time.

Table 7: Skills Required of Project Managers

Project Manager's Skills	% Significance
Planning and risk management	25
Communication and people skills and leadership	25
Technical skills and experience	25
Vision and focus on the end results	25

The table gives the percentage contribution of four project manager's skills that were condensed from the long list provided by the Interviewees in Table 6. The resultant four project managers skills all have equal status in complex construction projects.

The moment a project commences, a capable project manager should already be thinking about its completion, so that all planning efforts will be directed towards planning for its completion. Hence the need for strategic visions of the future and the ability to anticipate all work requirements. Especially those requirements that could impact on the achievement of project objectives.

CONCLUDING COMMENTS

There is no doubt that construction projects are becoming increasingly complex undertakings. This may be attributable to clients' demands and other technological developments. Project participants therefore need to possess special skills to manage these complex projects successfully. This paper has as its objective the determination of the skill sets required of project managers to manage complex construction projects. First there was a need to determine what constituted a complex construction project, then to determine what skills the project managers should have to successful manage this type of projects. The study interviewed five senior management personnel of five construction companies that are based in New Zealand to get their perspective views on the subject matter.

The study concludes that complexity in construction projects is dependent on seven key factors viz: uncertainty in project scope and requirements, poor documentation and insufficiency of design details technical and buildability issues, size and staging of project activities, the size and nature of relationships between the project participants, cultural issues related to location and resource availability, and organizational requirements for project execution. The study also concludes that four key project manager skills were necessary to cope with complex construction projects. The skill sets include those of planning and risk management, communication and people skills, technical skills and experience, and a good vision and focus on end results.

Whatever the level of complexity of construction projects, success is achievable so long as the right project manager with the right skills is engaged to tackle it. Although this may appear simple, unfortunately it is not the case always. The good news is that more and more organizations have embarked upon and succeeded on complex projects. There is an understanding of the requirement for special skills for competent project managers and a willingness to provide support when needed. This will result in a win-win for the project manager and these organisations. The roles of project managers are like a two-edged sword, which could result in either success or failure. The right vision for success comes from lateral thinking skills. Regardless of the level of complexity of construction projects, skills requirements will include those of: technical skill and experiential knowledge, communication and people skills, leadership, planning and risk management, and finally is the vision and focus on end results.

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COMMUNITIES OF PRACTICE: IMPROVING KNOWLEDGE MANAGEMENT IN BUSINESS

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ABSTRACT

The formation of communities of practice in business represents, possibly, the best way to manage knowledge bases in organizations since they integrate the most important dimensions in knowledge management: the technological dimension, the strategic dimension and the cultural or behavioral dimension. This paper explains what communities of practice are and why they serve as an efficient tool in knowledge management. Since this is a recently developed field, our study is exploratory, and is intended to identify trends and conceptual aspects associated with this topic. Our research will be based on the application of two bibliometric techniques (life cycle analysis and citation breadth analysis) to total articles related to communities of practice and published in academic and popular journals from 1998 to 2009. This paper demonstrates that the conceptual and practical framework revealed through the articles published during period under study prove that these communities integrates the technological, managerial and behavioral relevant factors. For this reason, writings on communities of practice are conceptually more solid than theoretical bases associated with knowledge management projects, which emphasize the technology-oriented and popular approaches.

JEL: I20, M12, M14, M53, M54

KEYWORDS: Job satisfaction, labor management, worker empowerment, corporate culture, training, personnel management, employee participation, knowledge management, communities of practice

INTRODUCTION

Since 1990, knowledge management became the new promise in business environment. The central idea behind this new approach is to motivate organizations to internally generate knowledge and information and allow the employees' access to such databases for immediate use and application. In our "knowledge society", a proposal like this is hard to resist due to the competitive advantage it offers. Some theorists go a step further by saying that knowledge's creation is a key source for competitive advantage in organizations; therefore, they argue that not only is a resource, but the primary asset. (Drucker, 1993).

However, there is no consensus regarding the value, meaning and usefulness of knowledge management as a management tool (Ponzi, 2002). A major difficulty lies in having focused such projects in terms of information technology almost exclusively (Skyrme, 1997). However, the problem lies not in the use of technological capabilities in themselves, but in fail to "capture and hold" the tacit knowledge that employees bring to organizations. (O'Dell & Jackson, 1998; Nonaka & Takeuchi, 1995).

So what is "knowledge management"? Apparently, as per literal use of the phrase, strategic management and the information systems are fundamental disciplines in knowledge management. But, are organizational culture and organizational behavior important issues in knowledge management?

The purpose of this paper is to demonstrate if the creation of communities of practice is an efficient platform for managing knowledge bases in organizations. The first part of this paper discusses why organizations has been facing problems in their knowledge management projects due to the fact that important behavioral characteristics has not been taking in consideration. Next, the paper proposes the

formation of communities of practice to close this gap in knowledge managing process. Finally, through the application of two bibliometric techniques, and literature review during 1998 to 2009, it will be shown that communities of practice is a more robust theoretical construct to understand and manage knowledge in organizations.

LITERATURE REVIEW

Knowledge Management-Conceptual Problem

Academic literature has been defined knowledge management from various theoretical perspectives. For example, although Nonaka and Takeuchi (1995) did not use the term "knowledge management", they defined the concept "organizational knowledge" as "the capacity which the company has to create new knowledge and distribute it throughout the organization." This implies active intervention of the human resources in knowledge management process. Skyrme (1997), on the other hand, defined it as "explicit and systematic management of vital knowledge on business ...." This definition is oriented towards the tendency to categorize knowledge as a productive asset, so the emphasis is on strategic management. On the other hand, O'Dell and Jackson (1998) introduced the technology perspective saying that, through knowledge management, organizations "can transfer the right knowledge to right people at the right time"

These definitions highlighted three aspects about knowledge management. First, any project aims to capture relevant information through electronic information systems. Second, it is a management process as it adds value to the company and promotes an efficient performance. Third, since it must take into account the organizational culture and human resources participation, the psychosocial perspective cannot be overlooked in these projects.

Indeed, recent researches in knowledge management confirm the importance of these three dimensions or theoretical constructs of knowledge management (Muzumdar, 1997; Mattila & Larsen, 2002). For example, Ponzi (2002) analyzed academic journals and trade articles from 1991 to 2001 in order to understand the evolution and conceptual development of the knowledge management field and confirm if the technological orientation was the principal orientation in knowledge management articles during such period. Sadly, attempts to develop knowledge management programs with particular orientation towards the technological and strategic aspects have been producing huge operational losses in businesses (Beazley, Boenich & Harden, 2002, Malhotra 2004).

As some scholars of organizational behavior have established, if we want to create an environment that will lead to continuous learning in organizations, it is necessary to know how human beings construct knowledge in social and dynamic interaction (Argyris, 1978, Lave & Wenger, 1991). For this reason, knowledge management projects should include more cultural considerations in their designs in order to be successful. Wenger (1998) proposes the creation of communities of practice in organizations to this end. In fact, these communities serve the social, cultural and cognitive tools for an adequate knowledge management in organizations. Also, they promote the interaction between different components of the organization, which encourages creativity and innovation in businesses.

Communities of Practice

For Malhotra (1997), a community of practice is a group of individuals that are held together by informal relationships through which they share identity, unity of purpose and meaning. Moreover, one of its main proponents, Etienne Wenger (2002), mentions that people in these communities share experiences within a particular domain of knowledge, which allow them to develop perspectives, practices and particular approaches as a group.

What do these definitions implies? Specifically, the interaction between members of such communities enables them to combine tacit and explicit aspects of knowledge, increasing the capacity and flexibility of knowledge bases in organizations (Wenger, McDermott & Snyder, 2002).

Thus, as an alternative to knowledge management in organizations, the communities of practice should avoid the biased trend of privileging the technological and strategic dimensions in the implementation of such projects. But, are such dimensions of relative importance in such communities' work or not?
Knowledge workers need to understand the applications of new technologies to their business environments. They can delegate certain tasks to information systems, which will allow them to concentrate their efforts on activities that add value and strengthen the creativity and innovation in organizations. In fact, technology is necessary, the managerial competence is important, but they are not unique categories. Cultural and human factors are vital. Therefore, when we analyze the conceptual structure of communities of practice, do we noticed that these communities keep the same technological and administrative bases as other forms of knowledge management, or consider the cognitive aspects and the social issues that have been absent from such projects?

METHODOLOGY

From the definitions of communities of practice outlined above, we derive concepts such as social interaction, mentoring, education, group dynamics, information systems, management practices, among others. Essentially, concepts that refer to the same three theoretical constructs that have served to narrow the field of knowledge management, according to scholarly and popular literature that we cited earlier: technological, strategic and management, and psychosocial. However, although various empirical researches demonstrate the origin of knowledge management and its theoretical constructs, this is not the case for the concept of communities of practice. Can we conclude, then, that it suffers from the same structural issues and conceptual problems than knowledge management?

To answer that question, we propose a bibliographical research on the concept of communities of practice, trough which we will analyze the academic and popular articles regarding this topic published from 1998 to 2009. We will use *ABI/Inform Database* to select those articles. This database compiles all articles related to business administration topics.

This will be an exploratory analysis based in the use of two bibliometric techniques: *life cycle analysis and citation breadth analysis.* The purpose of an exploratory research in this context is to identify, describe and analyze the characteristics of published articles in academic and popular journals, allowing us to examine the scope and nature of a recently developed concept (such as communities of practice) as well as understand all its implications.

The life cycle analysis will be used to examine and describe the trend and development that has been observed in the last twelve years in literature related to communities of practice. Our first research question in this phase will be: How has been the evolution of the concept of communities of practice from 1998 to 2009 according to business literature?

The citation breadth analysis will allow us to delineate the epistemological and practical development of such topic over those years. Our second research question in this phase will be: Do the publications from 1998 to 2009 show an interdisciplinary nature for the concept of communities of practice?

Study Design

A bibliometric analysis is the technique that best lends itself to an exploratory study because it produces a clear perception of the nature and behavior of an academic field (Lucca & Berrios, 2003). In this study we

used two of these techniques: the life cycle analysis (Abrahamson & Fairchild, 1999) and breadth and depth analysis (White & McCain, 1998).

The life cycle analysis serves to delineate trends in disciplines based on number and types of published articles over a particular period of time. The intention is to reveal patterns in literature in order to explore whether these changes have been motivated by a discursive shift or new paradigm in a particular discipline. In our research, this analysis served to study the evolution of communities of practice as a technical tool and an academic field during the years under review: 1998-2004.

Moreover, the breadth and depth analysis serves to examine the interdisciplinary and theoretical development of a discipline (Ponzi, 2002; White & McCain, 1998). This analysis shows what it is publishing under a new field of study, who are the most relevant authors, what areas of study serve as a basis for developing such new concept, what are the works most cited, among others. This analysis allowed us to reveal the conceptual structure of communities of practice.

Procedure

As stated already, a discipline is intimately linked to its literature, because it serves to document the problems, concerns and issues as manifestation of its development (Neely, 1981). For this reason, the unit of analysis was the article because it is the primary basis of communication within an academic area (Lopez, 1999). Articles represent a repository of knowledge developed in a field (APA, 2003).

Thus, the population subject to analysis represents the total number of articles published during 1998-2004 and 2004-2009 under the topic of communities of practice. As we will see later, the number of articles published under this concept, has been increasing dramatically since 2004. We used the database *ABI/Inform Global*, sponsored by *Proquest* electronic service, which organizes the articles published in professional journals based on the following categories: *academic, semi-academic and popular or trade*. Academic journals are prestigious, refereed journals, and semi-academic journals are moderate or high prestige, but not refereed. Popular magazines, on the other hand, are journals published by consultants and practitioners. Other databases are extremely useful, but not as specific in business matters.

We did a search of all articles published from 1998 to 2009 in this database and under the captions *abstract, title*, and *document text*. Also, we used the search phrase *communities of practice but not knowledge management*, in order to list all the articles that discussed issues related to communities of practice, exclusively. Later, we tabulated such articles by year of publication, type of journal or magazine in which they were published, and the nature of its content: information systems, strategic management and organizational behavior; in fact, the three theoretical constructs under analysis (see Table 1). Since the amount of articles published after 2004 increased geometrically, we separated data in terms of two periods: 1998-2004 and 2005-2009.

But, how had been evolving the concept of communities of practice from 1998 to 2004 and from 2005 to 2009? We will prepare graphs which will demonstrate trends and discursive nature of this field during these periods.

On the other hand, the application of breadth and depth analysis implies several steps. First, we determine the relative importance of academic journals in which articles were published. For this purpose, we used three rating systems used by different institutions: *Strategic Management Journal* published in March 2005, *University of Pennsylvania*, published in 1998, and the *Association for Information Systems* published in 2003.

Table 1: Number of Published Articles by Year, Journal Type and Content: Communities of Practice

Panel A: Journal Type				
Year	**Academic**	**Semiacademic**	**Popular**	**Totals**
1998	50	2	21	73
1999	52	2	13	67
2000	88	2	22	112
2001	111	2	31	144
2002	132	5	43	180
2003	130	8	44	182
2004	158	3	57	218
Totals	721	24	231	976
(%)	73.87%	2.46%	23.67%	
2005	2926	250	1892	5068
2006	3024	225	1701	4950
2007	2941	224	1576	4741
2008	2811	205	1528	4544
2009*	2391	163	1178	3732
Totals	14093	1067	7875	23035
(%)	61.18%	4.63%	34.19%	
Panel B: Content or Orientation				
Year	**Management**	**Information Systems**	**Organizational Behavior**	**Totals**
1998	12	6	51	69
1999	16	9	49	74
2000	21	19	61	101
2001	33	28	76	137
2002	39	38	104	181
2003	35	46	100	181
2004	42	56	130	228
Totals	198	202	571	971
(%)	20.39%	20.80%	58.81%	
2005	1627	1503	1944	5074
2006	1632	1443	1855	4930
2007	1491	1451	1800	4742
2008	1488	1393	1663	4544
2009*	1388	1106	1247	3741
Totals	7626	6896	8509	23031
(%)	33.11%	29.94%	36.95%	

*This table shows number of articles published in "ABI/ Inform" database for periods under study (1998-2004, 2005-2009). Panel A shows total articles published by journal type (academic, semiacademic and popular) and under the topic of communities of practice. The figure in each cell represents the amount of articles published for each year and type of journal. Panel B shows total articles published by content or discipline (management, information systems and organizational behavior) and under the topic of communities of practice. Figures in each cell represent the amount of articles published by year and under journal type or content. The percentage row (%) represents the proportion of articles published by journal type for periods under examination. *Totals include items recovered from the database search made in October 2009.*

We obtained a weighted average of the values assigned by these institutions to such prestigious journals and magazines and ordered them in terms of that weighted average. Later, we searched for the number of articles (more than two articles) related to communities of practice which were published in those journals during 1998-2004. Those journals carried the weight of publications in this field during 1998-2004. Articles published after 2004 were not taken in account for this procedure due to their volume (see Table 2 and Table 3).

Second, we used the databases *Social Sciences Citation Index (SSCI)* and *Science Citation Index (SCI)* to search for the most cited articles related to communities of practice for periods under study, as well as the fields of study more relevant and related to those selected articles. The *ABI/ Inform Global* does not allow recovery of data in terms of subject or fields of study, thus we need to use of these other databases (SSCI and SCI).

Table 2: Articles Published in Academic Journals, 1998-2004, Communities of Practice

Journal or Publication	Average	SMJ	WSU	AIS	1998-2004
Organizational Dynamics	19.3	19	-	19.5	3
Organizational Studies	17.5	25	-	10.0	10
Long Range Planning	17.2	14	-	20.3	3
Academy of Management Executive	17.0	17	-	-	4
California Management Review	15.6	24	11	11.7	3
Human Relations	14.3	12	-	16.5	12
Management Science	13.1	13	13.5	12.8	4
Sloan Management Review	11.0	-	11	11.0	7
Personnel Psychology	10.2	10	-	10.3	3
Organization Science	6.8	8	5.5	-	6
Strategic Management Journal	4.5	1	8.5	4.0	8
Academy of Management Review	4.1	5	2	5.3	9
Administrative Science Quarterly	3.4	6	3	1.3	5
Association of Computing Machinery	-	-	-	-	6
Management Learning	-	-	-	-	27
Marketing Management	-	-	-	-	11
Journal of European Industrial Training	-	-	-	-	7
Education & Training	-	-	-	-	3
Journal of Management & Governance	-	-	-	-	5
Journal of Organizational Change & Mgmt.	-	-	-	-	6
Journal of Workplace Learning	-	-	-	-	18
The Learning Organization	-	-	-	-	7
Computational & Math. Organization Theory	-	-	-	-	4
Human Resource Management Journal	-	-	-	-	6
Industrial & Communication Training	-	-	-	-	3
Journal of Economic Geography	-	-	-	-	3
Journal of Intellectual Capital	-	-	-	-	3
Information Science	-	-	-	-	4
Human Resource Management Int.l Digest	-	-	-	-	3
Journal of Education for Business	-	-	-	-	3
Journal of Management Education	-	-	-	-	4
Practical Aspects of Knowledge Management	-	-	-	-	5
Information Research	-	-	-	-	3
Information Society	-	-	-	-	4
Organization	-	-	-	-	3
Journal of Management Information System	-	-	-	-	3
Strategy and Leadership	-	-	-	-	3
Journal of Management Inquiry	-	-	-	-	3
Sub-total					224
Other (for journals with two articles or less)					747
Total					971
% journals with more than two articles					23.07%

This table shows the relative importance of academic journals in which articles related to communities of practice were published during 1998-2004. The figure in each cell under second column (average) represents weighted average of the rankings assigned by evaluating institutions to cited journals. The figures in cells under SMJ, WSU and AIS columns represent individual rankings assigned to same journals by each institution. The last column represents the number of articles published for 1998-2004 in cited journals and under communities of practice. (SMJ- Strategic Management Journal; WSU-Wharton School University of Pennsylvania; AIS- Association for Information System)..

Once items were recovered, we search for those articles cited three or more times in those databases and whose journal's ranking are better. In addition, we made sure that these articles were published by journals which also were part of *ABI/ Inform Global*, as this is the original database of the study. The goal of this process was to determine which authors carry the weight of publications, and what articles forms the conceptual bases for the development of communities of practice as a field of study during 1998-2004 (see Table 4).

Table 3: Articles Published In Semiacademic and Popular Journals, 1998-2004, Communities of Practice

Journal or Publication	SA	P
Fortune	5	-
Healthcare Forum Journal	-	4
Network World	-	3
Training	-	14
T & D	-	3
Computing Canada	3	-
Oil & Gas Journal	3	-
Government Executive		3
Association Management		9
Executive Excellence		3
Information Today		3
Management & Research News		3
Sub-total	11	45
Other (for journals with two articles or less)	13	245
Total	24	290
% journals with more than two articles	45.8%	15.5%

This table shows the relative importance of semiacademic and popular journals in which three or more articles related to communities of practice were published during 1998-2004. The figure in each cell represents total of articles published for semiacademic journals (SA) and popular journals (P). The percentage of articles from journals with more than two publications during 1998-2004 is represented by the last line of the table.

Table 4: Articles Most Cited in Academic Published in Semiacademic and Popular Journals, 1998-2004, Communities of Practice

Article's Title	Times cited	Ranking
Wenger, E. C. & Snyder, W. (2000). Communities of practice: The organizational frontier. *Harvard Business Review, 78*(1), 139-+.	62	4
Easterby-Smith M., Snell R. & Gherardi, S. (1998). Organizational learning: Diverging communities of practice? *Management Learning 29*(3), 259-272.	39	8
Robert, J. (2006). Limits to communities of practice, *Journal of Management Studies, 43(3), 623-639*.	39	18
Thompson M. (2005). Structural and epistemic parameters in communities of practice, *Organization Science, 16(2), 151-164*.	37	22
Handley K, Sturdy A, Fincham R, et al (2006). Within and beyond communities of practice: Making sense of learning through participation, identity and practice , *Journal of Management Studies, 43(3), 641-653*.	34	19
Wenger, E. (2000). Communities of practice and social learning systems *Organization, 7*(2), *225-246*.	32	24
Fox, S. (2000). Communities of practice, Foucault and actor-network theory *Journal of Management Studies, 37*(6), 853-867.	21	49
Wasko, M. M. & Faraj, S. (2000). "It is what one does": why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems, 9*(2-3), *155-173*.	21	50
Amin, A. & Roberts, J. (2008). Knowing in action: Beyond communities of practice, *Research Policy, 37(2), 353-369*.	19	10
Dube L, Bourhis A, Jacob,R. (2005). The impact of structuring characteristics on the launching of virtual communities of practice, *Journal of Organization Change Management, 18(2), 145-166.*	15	21
Lin FR & Hsueh, CM. (2006). Knowledge map creation and maintenance for virtual communities of practice, *Information Processing and Management, 42(2), 551-568.*	14	20
Comtu, A. & Wilmott, H. (2003). Re-embedding situatedness: The importance of power relations in learning theory. *Organization Science, 14*(3), 283-296.	12	32
Cross R, Laseter T, Parker A, et al. (2006). Using social network analysis to improve communities of practice, *California Management Review, 49(1), 32-+*	12	17
Lesser, E. & Storck, J. (2001). Communities of practice and organizational performance. *IBM Systems Journal, 40*(4), 831-841.	11	2
Liedtka, J. (1999). Linking competitive advantage with communities of practice. *Journal of Management Inquiry, 8*(1), 5-16.	10	1
Kaghan, W. & Phillips, N. (1998). Building the Tower of Babel: Communities of practice and paradigmatic pluralism in organization studies, *Organization, 5*(2), *191-215*.	9	9
Collier, J. & Esteban, R. (1999). Governance in the participative organisation: Freedom, creativity and ethics. *Journal of Business Ethics, 21*(2-3), 173-188.	4	6

This table shows most relevant articles under communities of practice and included in Social Sciences Citation Index (SSCI) and Science Citation Index (SCI) databases during 1998-2009. The first column represents number of citations of each article in such databases during 1998-2009. The second column represents the rank assigned in such databases to each article in terms of relative importance in communities of practice field during 1998-2009.

RESULTS

Our first research question was: How has been evolving the concept of communities of practice from 1998 to 2009 according to business literature? Table 1 shown the number of published articles related to communities of practice during the 1998 to 2004 and 2005 to 2009, both in terms of type of journals and nature of content. Table 1 demonstrated that percentages of academic articles in both periods (73.9% and 61.2%, respectively) were in proportion of three times to one, comparing with non-refereed and popular journals. On the other hand, we could say that in early years, articles under communities of practice were related to organizational behavior topics, substantially (58.1%). However, in the last five years, the consideration turned more interdisciplinary, since the proportion of published articles with technological, managerial and cultural orientations was, practically, the same (within 30% to 35%). This points to a much more solid theoretical view, because it shows that communities of practice represents an excellent platform for better performance in knowledge management, because they attends all important aspects in such projects: administrative, technological and cultural.

Our second research question was: Do the publications from 1998 to 2009 show an interdisciplinary nature for the concept of communities of practice? The citation breadth and depth analysis allowed us to delineate the epistemological and practical development of communities of practice topic over those years.

Table 2 shows the order established by three different systems used to classify most relevant academic journals in business topics. Journals were organized in terms of their weighted average of values assigned by each classification system. Only 77 of 971 articles (7.9%) retrieved from the database ABI/Inform Global belongs to most relevant journals, and 224 of 971 articles (23%) represents journals with three or more articles related to communities of practice and published from 1998-2004. However, 80 of such 224 articles (35.71%) were published in Organization Studies, Human Relations, Management Learning, Journal of Organizational Change & Management and Journal of Workplace Learning. These are academic journals with substantial content in organizational behavior, relation that supports the cultural orientation of communities of practice articles in early years.

On the other hand, Table 3 showed that three journals represented a 45% of all articles published in non-refereed journals with three or more articles from 1998-2004 (Fortune, Computing Canada and Oil & Gas Journal), while only 15% were represented by popular or technical magazines. Thus, in early years, communities of practice articles were more academic, cultural and theoretically based, not technically oriented.

However, Table 1 shows that trend has been changing since 2005. Although the orientation in the last five years is academic and conceptual too, all theoretical constructs have been receiving a fair treatment in literature: management topics, technology topics and organizational behavior topics.

Table 4 shows that only four articles comply with two essential characteristics: be one of most cited articles and have a high ranking. Those articles were cited ten or more times from 1998-2004 and were ranked within the first ten more relevant articles for the same period. For example, *Communities of practice: The organizational frontier* (Wenger & Snyder, 2000) was cited in 62 occasions and ranked as fourth more relevant article. In this article, Wenger and Snyder introduced communities of practice as a new organizational form that emerged to improve knowledge sharing and organizational learning and change. This is possible for these groups because they become closely related by their shared experiences and sense of purpose.

Organizational learning: Diverging communities of practice (Easterby-Smith, Snell & Gherardi, 1998) was cited in 39 occasions and classified as eighth most relevant article. Authors recommended the

creation of communities of practice as a new paradigm in creation and dissemination of knowledge. Such communities have a clear understanding of knowledge domain in their organizations and represents, as they stated an excellent mechanism to help companies in tacit to explicit knowledge transformation.

On the other hand, in the article *Communities of practice and organizational performance*, Lesser and Storck (2001) established that such communities promote behavior change and performance improvement. In their article details some achievements in formation of communities of practice: the degree of connection and interaction between participants, the creation of a sense of trust and mutual respect, and the formation of a common language and common context among members of the community. This article was cited in 11 occasions and was classified as second most relevant article.

Janet Liedtka, in her article *Linking competitive advantage with communities of practice* (1999), cited in 10 occasions and which was ranked first, considers that issues such as organizational learning, leadership, participation, collaboration and strategic thinking have been focused on business through decades. The intention behind these aspects is the same: companies could develop capabilities to adapt to continuous change. Lietdka stated that for any of these projects must have communities of practice as a platform. She also mentions that the fact that communities operate on the basis of a good value system will encourage that organizational practices mentioned above will be grounded on a goal congruence basis among all members of the organization as a primary value.

Undoubtedly, the most cited articles reach the same conclusion: the strength of communities of practice lies in providing the much needed psychosocial elements that will make knowledge management projects to be successful.

CONCLUSION

The principal purpose of this paper was to investigate how has been developing the concept of communities of practice according to business literature in recent years. Specifically, this research demonstrated that, since 1998, publications relating to knowledge management in organizations have been directed towards the formation of communities of practice as a workable platform. In fact, the interdisciplinary content of the articles of communities of practice was independent of the period and type of journal in which articles were published, suggesting that it is a better defined theoretical construct.

In order to reach this conclusion, we analyzed academic and popular articles regarding communities of practice and published from 1998 to 2009 in *ABI/Inform Database*. Later, we applied two bibliometric techniques to analyze selected articles: life cycle analysis to examine and describe the trend and development that has been observed in the last twelve years in literature related to communities of practice, citation breadth analysis to delineate the epistemological development of such topic over those years. The articles under examination were classified in terms of type of journal (academic, semi-academic and popular) in which they were published and its disciplinary content (strategic management, information systems or organizational behavior)

Our first research question was: How has been evolving the concept of communities of practice from 1998 to 2009 according to business literature? In early years (1998 to 2004), articles under communities of practice were related to organizational behavior topics, substantially. However, in the last five years (2005-2009), the consideration turned more interdisciplinary, since the proportion of published articles with technological, managerial and cultural orientations was, practically, the same. This point to a trend that reveals that the concept of communities of practice is more solid than the knowledge management projects, because they attend all important aspects: administrative, technological and cultural.

Our second research question was: Do the publications from 1998 to 2009 show an interdisciplinary nature for the concept of communities of practice? In early years (1998 to 2004), academic journals with substantial content in organizational behavior were privileged in business literature related to communities of practice, relation that supports the cultural orientation absent from knowledge management discussions. However, that trend has been changing since 2005. Although the orientation in the last five years is academic and conceptual too, all theoretical constructs have been receiving a fair treatment in literature: management topics, technology topics and organizational behavior topics.

In addition, once we examined the most cited and more relevant articles related to communities of practice and published during 1998-2009, we reached the same conclusion: the strength of communities of practice lies in providing the much needed psychosocial elements that will make knowledge management projects to be successful.

We had some limitations in our present study. A bibliometric analysis is a technique of discourse analysis that allows us to explore and describe the theoretical orientation of a field of study. In this study we assume that the theoretical constructs from previous studies on knowledge management (Mattila & Larsen, 2002; Ponzi, 2002), serve to analyze the nature of the literature on communities of practice. Indeed, the results of this research were consistent with these assumptions. However, as a bibliographic research and exploratory nature, we cannot generalize the findings of this study.

For future research, would be worthwhile to examine how established communities of practice consider technological, strategic and behavioral problems in their implementation. Following this research, we suggest a comparative analysis of companies that have implemented communities of practice with those which used other forms of knowledge management in their organizations. This analysis will aim to determine if establishing communities promotes organizational learning and knowledge management or will suffer, inevitably, the problems that already had other approaches in the past.

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PREVENTION AND DETECTION OF CERTAIN TYPES OF PLAGIARISM DURING COMPUTERIZED ASSESSMENTS

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ABSTRACT

Unfortunately, plagiarism is widespread on university campuses across the nation. The advances in the information technology provide even more sophisticated cheating prospects. Although there are many commercially available tools for detecting plagiarism but policing alone is not a comprehensive solution. We should strive to change the overall culture on university campuses in such a way that it discourages academic dishonesty. In this study, we present a tool called Test Guard that has two main features. First, it disables some cheating "techniques" such as copy-paste, insert file, etc. Then it checks the test for several types of plagiarism and generates a report on its findings.

KEYWORDS: academic dishonesty, cheating, plagiarism, computerized assessment

INTRODUCTION

As educators, we should strive to create an environment in academic classrooms that discourages academic dishonesty. Naturally, there are two ways of fighting plagiarism on university campuses – implementing processes to prevent them as much as possible, and employing procedures to detect them if they occur. This study aims to address these both approaches in one single methodology.

Unfortunately, the students' academic misconduct was always part of the higher (and not only) education. The advances in the information technology provide even more advanced and sophisticated cheating prospects. Recent studies on academic dishonesty show an alarming high rate ranging from 52% to 90% (Lester and Dekhoff, 2002; Vowell and Chan, 2004). Diekhoff and his colleagues suggest that the rate of plagiarism have grown from 54.1% in 1984 to 61.28% in 1994, and "it is getting worse" (Diekhoff, LaBeff, Clark, Williams, Francis, and Haines, 1996). In more recent years, Don McCabe conducted a research for the Center for Academic Integrity at Duke University by surveying 50,000 undergraduate students during 2002 to 2005 on 60 university campuses nationwide. The research showed that 70% of surveyed students reported cheating (Hudd, S.H., Apgar, C., Bronson, E., F., and Lee, R.G., (2009)).
The current literature is analyzing the cheating phenomenon from various angles, such as why do students cheat, which type of relationships exist between cheating and demographic factors such as gender, ethnicity, major, Greek membership, how to prevent cheating in different settings, and how to detect cheating if it occurs.

By analyzing the literature on academic integrity, one can notice that educators have directed their efforts mainly towards detection of plagiarism; much less work is done towards prevention of it. This paper is a contribution in filling this gap for a specific yet widely used type of assessment – computerized tests and quizzes. In the paper, we present a tool called *Test Guard*, which has dual functionality. First, it tries to prevent cheating by disabling some cheating "techniques" such as copy-paste, insert file, etc. Then it checks the test for several types of plagiarism and generates a report on its findings. The report is embedded and hidden in the student's test file and is password protected – only the professor can see it.
The remainder of the paper is organized as follows. Section 2 briefly discusses the relevant literature on academic dishonesty. The short description of the functionality of the *Test Guard* is presented in the Section 3. Finally, the Section 4 concludes the paper with discussion, limitations of the proposed methodology and possible directions for future research.

LITERATURE REVIEW

There have been many discussions of academic integrity in resent literature -Rudebock, R. D. (2005), McCabe, D., and Pavela, G. (2004), Chapman, K. J., Davis, R., Toy, D., and Wright, L. (2004), Storch, E. A., and Storch, J. B. (2002), Bernardi, R. A., Metzger, R. L., Bruno, R. G. S., and Hoogkamp, M. A. W. (2004), Carpenter D. D., Harding, T.S., Montgomery, S. M., Steneck, N. H., and Dey, E. (2002), Caruana, A., Ramaseshan, B, and Ewing, M. T. (2000), Coleman, N., and Mahaffey, T. (2000), Hard, S. F., Conway, J. M., and Moran, A. C. (2006), Hardling, T. S., Carpenter, D.D., Finelli, C. J., and Passow, H. J. (2004), Hudd, S.H., et al. (2009), Hardling, T. S. (2000). The topic continues to be one of the hotest topics in the educational research because the severity of academic dishonesty is increasing. Academic dishonesty is analyzed and studied from various angles. For example, McCabe D.L. el al. (2004) have outlined principles of academic integrity; Chapman, K.J., et al. (2004) and Mathison, D.L. (2010) studied academic integrity in the Business School environment. Similar study is done by Passow and his colleagues for engineering students (Passow, Mayhew, Finelli, Harding, and Carpenter (2006); Kidwell, L.A. et al. (2003) and Koljatic, M. et al. (2002) analyzed and compared students' and faculty's perception of dishonest academic conduct. Some researchers study the cheating pattern in their particular universities and provide specific guidelines for preventing and detecting plagiarism (Hudd et al., 2009; Kitahara, Westfall, and Mankelwicz, 2011).

Nonis and Swift analyzed the correlation between academic dishonesty and workplace dishonesty (Nonis, S. A., and Swift, C. A. (2001). Steam studied how the relationship between students and professors effects on academic integrity (Stearns, S. A. (2001). There are many commercially available tools for detecting plagiarism and the TurnItIn is probably the most commonly used among them (http://turnitin.com). An effective procedure for handling cheating on multiple-choice tests was developed by Harpp and his colleagues (1993, 1996). Nath, L., and Lovaglia, M. (2009) developed software, which goes further by precisely estimating the probability that copying of answers took place between two students taking a multiple-choice exam. Joseph Fulda developed a plagiarism detection method using WordPerfect (Fulda, J.S., 2009). Regardless of the wide range of research articles related to the plagiarism, all of them came to the same conclusion – the problem does exist, it is getting worse and we need to come up with policies and procedures, which will help to create an environment of academic honesty, prevent plagiarism as much as possible, and detect it when it occurs.

THE TEST GUARD

As it was mentioned above, the tool is designed to be used in computer-based tests or quizzes. It allows the detection of certain types of cheating, namely when one student submits a work that was completely or partially done by another student on another computer. Here are some possible cheating scenarios:

1. Student A asks his classmate Student B to help with the test. Student B completes the test and sends a copy of it to Student A. Then Student A slightly "personalizes" the file (adds his name, changes some colors or fonts, etc.) and submits the file as his own work.
2. Student A sends test file and requirements to a person who may be located anywhere in the world. This person completes the test and sends the file back to Student A. Then Student A submits the ("personalized") work as his own.
3. Student A gives his password to a person who may be located anywhere in the world. This person logs into the system as Student A and completes the test. Then Students A changes his password.

Because the vast majority of tests require the creation of Microsoft Word documents, the current version of *Test Guard* it designed to prevent and detect plagiarism in case when students should either create a new Word document from scratch, or complete a test file prepared by the professor. The idea is to "beef-

up" the test file with a special software written in VBA – Visual Basic for Applications (Mansfield, R. (2008), Jacobson, R. (2002), Albright, C. S. (2001)), which will not have any visual effect on the test file at all, i.e., the test file will look like exactly the same before and after "beefing-up". This hidden software is the backbone of the tool – it prevents and detects possible occurrences of plagiarism. The user of the tool, i.e. the professor giving a test or a quiz, does not have to know anything about programming at all - the programming part is completely hidden from the professor (as well as from the students).

The *Test Guard* can be used when a professor is providing a partially completed test file in Microsoft Word (input file) and asking students to finish it. If the nature of the test is such that students should create a file from scratch, then Test Guard can still be easily used by creating a blank Word file and asking students to use it for the test. The *Test Guard* does its job by adding invisible code to the test's input file, which prevents various cheating methods, creates report on computers usage for the test, as well as implements some other security features.

Preparing an input file for the test is very simple task and it takes less than 20 seconds to complete. The professor should open the single-page "*Test Guard.docm*" file, which contains short descriptions of the tool and one-step instruction which tells the user to click on "*No cheating*" button that was added (by *Test Guard*) to the "Quick Start" menu located in the upper left corner of the screen. When the button is clicked, a standard "Open" dialog box appears where the user can select the test file. If there is no initial test file, then *Test Guard* will ask the user to enter a name for a blank test file. As soon as the selection is made, i.e. either an existing test file is selected or a name for a blank test file is provided, the user is asked to enter a password, which will be used to display various statistical information on usage of the test file by a student(s). This is all the professor should do. The input file for the test is now "processed", i.e., "beefed up" with security features and is ready for distributed to students.

As it was mentioned above, one of the most important characteristics of this tool is its ability to prevent certain types of plagiarism. When student opens a test file and starts working on it, various "cheating" techniques are disabled. For example, student cannot copy an information from somewhere (from other file, Internet, etc.) and paste it into his or her document because "paste" feature will simply not work! The same is true for inserting a file into the test document. There are some other security measures implemented in *Test Guard*.

All these measures are good tools to prevent cheating on the test, but unfortunately, some student may still try to find ways to cheat – see some possible scenarios described above. The good news is that the same *Test Guard* can not only prevent, but also detect cheating. The professor does not have to do anything extra to use those detection features – they are already implemented in the test file.

This is how it works: when a professor opens the student's test file for grading, a new line adds to the "Add-Ins" menu item called "*Any Cheating?*" (If there was no "Add-Ins" on the ribbon then it will be added by *Test Guard*). It acts as a toggle switch, which shows or hides a password protected textbox with descriptive information on usage of the test file. It also checks for possible cheating. Table 1 depicts a content of the textbox before the test file is distributed to the students.

Table 1: The content of the textbox before distributing the test to students

Just Created		
---------- Activity Report----------		
USERNAME	COMPUTER NAME	TIME
Administrator	HOME-AB29CFC53F	6/9/2010 7:08:39 PM – Professor

*This table presents the activity report, which was embedded in the test file by **Test Guard** before distributing the test to students.*

The first entry in this textbox is related to the professor who created the test and contains his or her username, computer name and the test creation time.

When students submit the test files, the professor may check and see if there was any cheating involved. In order to do so, the professor should unhide the embedded (in the test file) statistical information generated by *Test Guard*. This information is password protected and can be retrieved by selecting the "Any Cheating?" command in the "Add-Ins" menu. Here are some possible types of embedded information.

Example 1: Sam Brown Did Not Cheat

Figure 4 below shows the information which the professor retrieved by clicking the "Any Cheating?" command in the "Add-Ins" menu while grading Sam Brown's test file. As one can see, Sam Brown honestly took his test on computer station #1356 and completed it at 8:10 pm. No cheating was detected.

Table 2: Sam Brown Did Not Cheat

No Cheating Was Detected!		
---------- Activity Report----------		
USERNAME	COMPUTER NAME	TIME
Administrator	HOME-AB29CFC53F	6/9/2010 7:08:39 PM – Professor
sbrown	DSKT00001356	6/10/2010 7:04:37 PM
sbrown	DSKT00001356	6/10/2010 8:09:56 PM

*This table presents the activity report, which was embedded in Sam Brown's test file by **Test Guard**. Mr. Brown completed his test honestly.*

Example 2: Tom White Did Cheat

Table 3 below shows the activity report embedded in Tom White's test file, which was retrieved by clicking the "Any Cheating?" command in the "Add-Ins" menu. Cheating was detected, because computers' names in the second column are different. This informs the professor that Tom got a test file from a student N. Simon, sitting at station #1345. In this scenario, both students who were engaged in cheating are uniquely identified.

Table 3. Tom White Did Cheat

Cheating!		
---------- Activity Report----------		
USERNAME	COMPUTER NAME	TIME
Administrator	HOME-AB29CFC53F	6/9/2010 7:08:39 PM – Professor
nsimon	DSKT00001345	6/10/2010 7:06:55 PM
nsimon	DSKT00001345	6/10/2010 7:55:16 PM
twhite	DSKT00001367	6/10/2010 7:59:35 PM
twhite	DSKT00001367	6/10/2010 8:12:24 PM

*This table represents the activity report, which was embedded in Tom White's test file by **Test Guard**. Cheating was detected.*

Example 3: Nancy Brown Also Cheated

Table 4 below shows the activity report embedded in Nancy Brown's test file, which was retrieved by clicking the "Any Cheating?" command in the "Add-Ins" menu. In the activity report, cheating was detected because computer names in the second column are different. This informs the professor that Nancy sent her test file to Bill Gray, who completed the test and sent it back to Nancy. Then Nancy probably made some cosmetic changes and submitted the file as her own work. In this case, Bill Gray could be located anywhere in the world.

Table 4: Nancy Brown Also Cheated

Cheating!

---------- Activity Report----------

USERNAME	COMPUTER NAME	TIME
Administrator	HOME-AB29CFC53F	6/9/2010 7:08:39 PM – Professor
nbrown	DSKT00001334	6/10/2010 7:03:12 PM
Bill Gray	Billy	6/10/2010 7:15:19 PM
Bill Gray	Billy	6/10/2010 7:48:32 PM
nbrown	DSKT00001334	6/10/2010 8:01:48 PM

This table represents the activity report, which was embedded in Nancy Brown's test file by ***Test Guard****. Cheating was detected.*

DISCUSSION

Disappointingly, cheating is widespread on almost all university campuses. As educators, we have to create a learning environment where plagiarism is unacceptable. But how to do it? Obviously, it is not enough to limit ourselves with policing students while they are taking a test or a quiz. It seems that one possible solution could be the implementation of an honor code on university campuses, but the literature reports contradicting results. While McCabe and his colleagues found that, the honor code reduces the level of cheating (McCabe, Trevino, and Butterfield, 1999), Vandehey and his colleagues found that "Student awareness of an honor code with broad university support did not reduce student cheating" (Vandehey, M. A., et. al., 2007). As many courses became available online and many professors started giving computerized tests and quizzes, the cheating on such assessments become more sophisticated. Nowadays, students may use various Internet-connected devises in a way that are harder to detect than in the past. Copying a text from the Internet, modifying it and submitting as his or her own work is even not considered as cheating by some students.

The *Test Guard* introduced in this study, is a methodology, which tries to incorporate two aspects of cheating – prevention and detection, in a single tool. The tool has dual functionality. First, it tries to prevent cheating by "disarming" students in terms of disabling various commonly used cheating techniques, such as copy-paste and insert. Second, it implements variety of detection features, which will alarm the professor about the cheating, if it took place. The latter is reaches by collecting various types of information on students' activities during the assessment process. This information is invisibly embedded in the students' test flies and is password protected – only the professor can review them. Based on this information, the professor can not only detect the plagiarism but also figure out which type of cheating did occur. To our knowledge, this approach, i.e., combining the prevention and detection in one integrated tool, is new and there are no competing tools on the market.

We should mention some limitations of this study. First, the tool is limited to computerized assessments using Microsoft Word only and the assessment should take place in the classroom. We deliberately started with Microsoft Word, because it is one of the most commonly used assessment environment in the higher education. The second limitation is more technical – in order to use the tool, the macros in the Microsoft Word should be enabled otherwise the embedded software cannot work. If macros are disabled, then the students should enable them because it is impossible to enable macros programmatically (for security reasons). A computer-savvy student may try to take advantage of this fact and tamper with the functionality of the tool.

The future research may develop in various directions. One direction could be the extension of the tool beyond Microsoft Word. For example, creation of a similar tool for assessments in Microsoft Excel. It could be a useful instrument in assessing student enrolled in classes like "Introduction to computers". Another direction could be making this tool web-based. Yet another direction could be adding mere security features into the tool, which will prevent tampering with it by computer-savvy students.

CONCLUDING COMMENTS

Recent studies on academic dishonesty show an alarming high rate ranging from 52% to 90% (Lester et al., 2002; Vowell et al., 2004). The advances in IT can make it even worse. Thus, it is imperative for us, educators, to be very proactive in developing and implementing various tools for prevention and detection of plagiarism. This study is dedicated to this goal – the integrated methodology is proposed which combines both prevention and detection in a single and easy-to-implement tool.

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