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# ARE STUDENTS AND THEIR PARENTS VIEWED AS CUSTOMERS BY AACSB—INTERNATIONAL MEMBER SCHOOLS?  SURVEY RESULTS AND IMPLICATIONS FOR UNIVERSITY BUSINESS SCHOOL LEADERS

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## ABSTRACT

*This paper is part of a continuing research stream dealing with organizational behavior and culture in higher education, specifically within AACSB-International member schools. Using responses to a national  survey sent to AACSB-International members schools located in the United States, we report perceived customer orientation levels as part of a larger measure-- market orientation levels-- toward students and parents of students.  Customer Orientation and Market Orientation levels are reported for Academic Vice-Presidents, Business School Deans, and Accounting Department Chairs.  A customer orientation strategy is a necessary part of an organizational environment leading to a market-oriented culture and is based upon the acceptance and adoption of the marketing concept.  The market-oriented organization recognizes the importance of coordinating the activities of all departments, functions, and individuals in the organization to satisfy customers by delivering superior value.  The market-oriented organization continually monitors customer information, competitor information, and marketplace information to design and provide superior value to its customers.  Theory and empirical research suggest that higher levels of market orientation result in higher levels of organizational performance.  Comparisons of the various input scores submitted by the survey respondents are made against a benchmark established for businesses in the marketing literature and then scores are compared by administrative groups against one another. 102 Vice-Presidents, 141 Business School Deans and 102 Accounting Department Chairs responded.  The paper presents details of the research process, findings, statistical inferences, and discusses the implications of the research for leaders of business schools and academic accounting departments.*

# INTRODUCTION AND DEFINITIONS

All forms of organizations, businesses, hospitals, governments and educational providers, seek to attain and maintain high levels of performance. But, can a particular organizational strategy or culture lead to improved organizational performance? And, if so, can such a strategy or culture be described and then be measured quantitatively? And, if measurements can be made will comparisons in measurements between organizations and/or between organizational levels be advantageous in helping organizations improve their performance?

This paper investigates these questions, measures specific components of organizational strategy and compares two types of organizations. The organizational strategy measured is market orientation, of which a subset is customer orientation. The quantitative measurement is accomplished by way of a scaled instrument used in a national survey. The organizational behavioral and cultural comparisons described in this research are between commercial businesses and schools of business administration.

In the marketing literature, two terms, the marketing concept and market orientation are often found. To help provide clarity and to explain differences and relationships in these terms, the two are defined below.

> \* The *marketing concept* is a philosophy that advocates that a successful organization begins with identifying customer needs and wants, decides which needs to meet, and involves all employees in the process of satisfying customers.

> \* *Market orientation* refers to an organizational culture in which everyone in the organization is committed to the customer and adapts in a timely manner to meeting the changing needs of the customer. Market orientation blends a company culture dedicated to providing superior value with successfully achieving a customer focus, acquiring competitor intelligence, and maintaining interfunctional coordination. It is viewed as the implementation of the marketing concept.

# DISCUSSION AND LITERATURE REVIEW

The *Baldrige Education Criteria for Performance Excellence*, developed by the Baldrige National Quality Program (BNQP 2005), rest on the assumption that universities can take steps to achieve "performance excellence". The document specifies certain marketing-related activities, and emphasizes the need to identify and plan strategies with respect to various segments of students, parents of students, employers of students and other stakeholders and other markets.

The Baldrige criteria are designed to be used for self-assessment, awarding Baldrige prizes, and providing feedback to educational institutions applying for them, but have other important purposes as well. They can be used by any university business school, for example, regardless of whether or not it is an award applicant, to "improve organizational performance practices, capabilities, and results," to "facilitate . . . sharing of best practices," and to assist in "understanding and managing performance . . . guiding organizational planning and opportunities for learning" (BNQP 2005).

Excellence of performance in higher education is self-evidently important. In accounting and in the other business disciplines, excellence is assessed and assured by the qualification standards of the bodies awarding formal accreditation to business schools (Karathanos and Karathanos 1996). In the U.S.A., the main accreditation body is AACSB-International (the Association to Advance Collegiate Schools of Business). Performance is ranked more informally in the U.S.A. by the annual guide published by *U.S. News and World Report* and by the *Peterson's* web-based educational information resource, both directed at prospective students, their parents and their advisers.

The scope of marketing was successfully broadened decades ago to include universities and other non-business organizations (Kotler and Levy 1969a, 1969b). Many other marketing academics have since discussed and demonstrated the benefits of applying marketing to services in general (Lovelock 1983; Swenson 1998) and higher education in particular (Hayes 1989; Miller *et al*. 1990). University business school administrations and other stakeholders should be interested in strategic marketing applications and any other actions that could have a significant impact upon performance levels. Nevertheless, the evidence is that some still resist the application of business models and marketing (Clayson and Haley 2005) and that much of the higher education sector does not apply formal strategic marketing planning practices (Hammond *et al*. 2004). The 'senior leaders' invoked in the Baldrige criteria may in principle accept the importance of quality, performance and continuous improvement, yet in practice resist the notion that academic institutions could or should consider students, parents and other stakeholders as customers.

The study reported here, part of a stream of continuing research, and is a further effort to encourage the application of strategic marketing theory and practice within higher education. We know, from previous empirical research (Hammond *et al*. 2006) that the behaviors and actions indicative of a high level of market orientation generally lead to higher levels of performance within university business schools. The research further indicates that emphasis by higher education leaders can positively impact market orientation levels. We also know that customer orientation and overall market orientation levels reported for private business schools are generally higher than those reported for public business schools (Webster *et al*. 2005).

The marketing concept advocates that all activities of a firm should be directed toward satisfying the customer. The market orientation construct has been developed, defined and measured to operationalize the implementation of the marketing concept. Narver & Slater

(1990) and Kohli & Jaworski (1993) concluded that market orientation is the type of business culture and climate that can be created within an organization that will most effectively lead to the behaviors and actions necessary to achieve a sustainable competitive advantage. The degree that the marketing concept has been implemented is manifested in the behaviors and actions of the organization. This degree is the level of market orientation, of which customer orientation is a subset, exhibited by the organization.

Narver & Slater (1990) describe a firm that is market oriented as one whose culture is systematically and entirely committed to the continuous creation of superior value for its customers. Others characterize a market orientation culture as one in which a business focuses on customer wants and needs, continuously analyzes its competition, and coordinates all organizational activities toward customer satisfaction (Kotler 1980; Narver *et al.* 1992; Slater & Narver 1994; Siguaw *et al.* 1994). Theory suggests and empirical research has found that greater levels of market orientation within a business result in a greater ability of the organization to achieve its objectives (Barksdale & Darden 1971; Houston 1986; Kohli & Jaworski 1990; Narver & Slater 1990; Jaworski & Kohli 1993; Siguaw *et al.* 1994). Research to date however has only recently begun to address market orientation measurements in non-profit organizations such as universities (Webster *et al.* 2005; Hammond *et al.* 2006).

A high degree of market orientation indicates that individuals in the organization are committed to customer satisfaction and remain so over time by recognizing changes in customer needs and wants, and reacting and adapting in a satisfactory manner to those changes. The process is dynamic and subject to forces external to the organization such as its competitors and the general state of the economy, and it is a process that should be viewed on a continuum. In other words, it is not a culture that an organization either has or does not have, but is rather a matter of degree. Slater & Narver (1994) note that market conditions and competitive threats are never static; and, a high degree of market orientation is not achieved overnight but rather over time given adequate commitment from the firm's management and time for a supportive culture to develop.

For decades the philosophy expressed by managers was a belief in the practical importance of a successful marketing function as an effective way to help the organization to achieve its objectives (Felton 1959; Levitt 1969; McNamara 1972). More recently, researchers have found that greater levels of market orientation result in a greater organizational ability to achieve its objectives (Houston 1986; Narver & Slater 1990; Jaworski & Kohli 1993; Kohli & Jaworski 1993; Siguaw *et al.* 1994).

The measurement of market orientation in the business organization was pioneered by Narver & Slater (1990). Drawing from theoretical research, they operationalized the market orientation construct as consisting of three separate and equally important components: (1) customer orientation, (2) competitor orientation, and (3) interfunctional coordination. Narver & Slater (1990) reported market orientation scores for three separate types of businesses: commodity, specialty, and distribution. The commodity and distribution businesses produced

and sold generic products designed for a wide range of customers.  The specialty business firms produced and sold products that were individualized (relative to the commodity products) for specific customer orders.  By adapting its generic or base product, the specialty products firm creates superior value and thereby provides more benefit to the customer.  They created multiple item scales for the measurement of each of the components.  The scales included antecedent variables, moderator variables, and consequence variables, e.g., performance.  Finally, the scale measured overall market orientation by averaging the three components or dimensions of the measurement scale.

Empirical research on the market orientation culture has focused on the business enterprise with less emphasis on potential applications in non-profit organizations.  Non-profit organizations such as churches, civic organizations, universities, and hospitals focus on customers or clientele wants and needs just as the business concern does.  Given that successful businesses report higher levels of market orientation, we might expect a similar situation to be present in non-profit organizations as well.  From a large group of potential non-profit organizations, we chose certain Schools of Business Administration to research because of their seeming similarities to business enterprises.  Specifically, a school of business has a number of constituencies to serve, it must determine wants and needs of its clientele, it operates to provide value to its constituencies, it is influenced by external factors, and it is an organization with many interfunctional areas and departments.  Although a school of business administration does not exist to create profit or shareholder wealth, it does seek to achieve organizational goals such as surviving as an organization, increasing its professional reputation, improving its facilities and faculty, and growing its enrollment and endowment.  Additionally, business schools teach the principles, methods, and techniques used by businesses in their pursuit of success and business school deans and faculty often have a business background.  These factors tend to suggest that business school leaders (academic vice-presidents, deans and department chairs) and business leaders (managers) may possess similar managerial mindsets, values, and temperaments as well as implementing similar leadership styles, methods and techniques.

Recalling that the philosophy of providing superior value to customers (relative to competitors) is the marketing concept, this philosophy should be applicable to universities as they too have customers, competitors, external influences, and seek to accomplish organizational goals.  Although the primary objective for the business enterprise is profitability, Slater & Narver (1994) argue that in the non-profit organization, survival is analogous to profit in a business enterprise.  Specifically, to satisfy constituencies in the long run requires that revenues must be adequate to cover long-run expenses and therefore survive.  Like the business enterprise, the non-profit entity has organizational objectives that is seeks to achieve.

As in the profit-seeking business, quality, performance, and continuous improvement are objectives of schools of business administration both in the short-term and the long-term.  Progress in achieving such objectives is part of the evaluative process addressed by the Baldrige Education Pilot Criteria (Karathanos & Karathanos 1996) and the AACSB--International

Standards. Also, *U.S. News and World Report* and *Peterson's College Guide* as well as other publications issue annual college guides that provide various measures of performance to assist students and parents in the college selection process. Consequently, the leaders of schools of business administration should be interested in an organizational culture that could positively impact the quality and performance of their schools. This research collects, analyzes and reports on the market orientation culture within schools of business administration that are members of AACSB-International. Member schools of this organization all choose to join the accreditation organization, volunteer to undergo the accreditation process, and must meet accreditation standards on a continuing basis.

Academic vice-presidents, business school deans and accounting department chairs whose school hold membership in AACSB-International were selected for study because the accrediting organization holds to a commitment of continuous improvement in business education. Schools that are accredited by AACSB-International have undergone a series of reviews over time, have demonstrated success at achieving organizational goals, and therefore may exhibit an organizational culture with a bent toward market orientation, much like that of successful businesses.

## RESEARCH QUESTIONS

Although there are numerous customers or stakeholders that could be addressed in the university setting, we limited our examination to two groups—students and parents of students. The objectives of the study were to answer the following research questions:

* To answer research question one, the reported market orientation mean scores of the academic vice-presidents were calculated for the two customer groups (students and parents of students) for the four dimensions of market orientation (customer orientation, competitor orientation, internal coordination, and overall market orientation).

* To answer research question two, the reported market orientation mean scores of the business school deans were calculated for the two customer groups (students and parents of students) for the four dimensions of market orientation (customer orientation, competitor orientation, internal coordination, and overall market orientation).

* To answer research question three, the reported market orientation mean scores of the accounting department chairs were calculated for the two customer groups (students and parents of students) for the four dimensions of market orientation

(customer orientation, competitor orientation, internal coordination, and overall market orientation).

* To answer research question four, the mean scores of the academic vice-presidents, deans and accounting chairs were compared to the mean scores of specialty business managers as reported in the marketing literature by Narver and Slater (1990). A series of t-tests were used to compare mean scores of the academic vice-presidents, deans and accounting department chairs to those of the business managers.

* To answer research question five, the mean market orientation scores of the academic vice-presidents, business school deans, and accounting department chairs were compared to each other to determine if differences existed between the various academic administrators. For each comparison, t-tests were conducted separately on the four components of market orientation.

## METHODOLOGY

A cover letter, survey instrument, and business reply envelope were mailed separately to the deans and to the accounting chairs of schools of business holding membership in AACSB-International. After a follow-up letter, 102 useable responses were received from the academic vice-presidents, 141 useable responses were received from the business school deans, and 102 useable responses were received from the accounting department chairs. As key informants, (Campbell 1995; Phillips 1981), the vice-presidents, deans and department chairs were asked to complete the survey and return it in the business reply envelope.

The questions to measure the three subscales (customer orientation, competitor orientation, and organizational coordination) in the Narver and Slater original scale were modified somewhat to conform to the vocabulary and the types of stakeholders prevalent in academic institutions. For example, two of Narver and Slater's questions were:

* Our objectives are driven by satisfaction of our customers.
* We measure satisfaction of our customers systematically and frequently.

The questions were amended for the current research and were worded as follows:

* Our objectives are driven by satisfaction of our students/parents of students.
* We measure satisfaction of our students/parents of students systematically and frequently.

Churchill (1979) suggests that the appropriateness of scales borrowed from other studies needs to be addressed before survey research is accomplished. Therefore, all our scale items were pre-tested before mailed to the deans and department chairs. We first consulted with several deans, chairs, and other university administrators. These consultations resulted in a cover letter that more clearly defined the purpose of the research and rewording of several questionnaire items.

Thirty (30) questions were used in the collection of the data. Each of the questions were to be answered using a seven (7) point scale that was anchored with "not at all" (1) and "to an extreme extent" (7) so that the higher numbers represented a higher (or greater) perceived level of market orientation. The scales were subjected to reliability analysis, exploratory factor analysis and confirmatory factor analysis prior to use (Wheaton, Muthen, Alwin, & Summers 1997; Bentler & Bonett 1980; Marsh & Hocevar 1985; Bentler 1990; Browne & Mels 1992; and Browne & Cudeck 1993). Results of these analyses indicated satisfactory reliabilities (ranges from .73 to .91), satisfactory item-to-total correlations (ranges from 0.3 to 0.8), exploratory factor loadings ranging from 0.33 to 0.89, and confirmatory factor loading ranging from 0.36 to 0.82. Additionally, the confirmatory factor analysis demonstrated generally acceptable fit. These test results included comparative fit index measures ranging from .784 to 1.000, a Tucker-Lewis index ranging from .702 to 1.000, and the CMIN/DF ranging from 2.05 to 2.56. The RMSEA low values at the 90% confidence interval fell below 0.10 for all scales.

Although the literature indicates (Berdie 1989) that the presence of nonresponse bias in mail surveys does not necessarily alter the survey findings, we nonetheless proceeded to test for nonresponse bias. We used Larson and Catton's (1959) proxy methodology wherein potential nonresponse bias between early and late respondents is examined. These tests indicated no statistically significant difference between the early and late responders.

Then, following the methodology of Narver and Slater, we combined the three subscales to form an overall, or composite, measure of market orientation. We then conducted separate t-tests for each of the four dimensions of market orientation to determine if a statistically significant difference existed between the various market orientation mean scores of the vice-presidents, deans, accounting department chairs, and the business managers. Then we conducted a series of t-tests to determine of the mean scores of the academic vice-presidents, business school deans and accounting department chairs differed from one another.

## RESULTS

Table 1 shows the mean customer orientation scores as well as the overall market orientation scores toward students for the three groups of academic administrators and shows that there are significant statistical differences in levels of customer orientation and in levels of overall market orientation between the business managers and the business school leaders (the academic vice-presidents, deans, and accounting department chairs). In the comparisons

between the academic vice-presidents, business school deans, and accounting department chairs the customer group was "students". The business managers reported market orientation mean scores that were higher in absolute terms than all of the school administrators in each of the four dimensions of market orientation.  Of the scores, statistically significant differences at the 0.01 level were found between the business managers and the school administrators in 11 of the 12 comparisons. The only statistically insignificant difference between the business managers and the school administrators was in the dimension of interfunctional coordination between the business managers and the academic vice-presidents.  Hence we know that there are indeed differences between business managers and business school administrators in the levels of customer orientation and market orientation.

| Table 1:  Means and t-test Results for Accounting Department Chairs, Business School Deans and Academic Vice Presidents versus Specialty Business Managers | | | | |
|---|---|---|---|---|
| Market Orientation Measurements (7 point scale) | | | | |
| Market Orientation Construct: | Business Managers n=75 | Accounting Chairs n=102 | Business Deans n=141 | Academic VPs n=102 |
| | *M* | *M* | *M* | *M* |
| Customer Orientation | 5.05 | 4.44* | 4.55* | 4.77* |
| Competitor Orientation | 4.71 | 3.38* | 3.71* | 4.17* |
| Interfunctional Coordination | 4.53 | 3.70* | 4.13* | 4.44^ |
| Overall Market Orientation | 4.77 | 3.84* | 4.13* | 4.46* |

| Table 2:  Means and t-test Results for Academic VPs and Business School Deans | | | | |
|---|---|---|---|---|
| Customer Group:  Students | | | | |
| Market Orientation Measurements (7 point scale) | | | | |
| Market Orientation Construct: | Academic VPs | Business Deans | t-value | Significance |
| | *M* | *M* | | |
| Customer Orientation | 4.77 | 4.55 | 1.56 | Ns |
| Competitor Orientation | 4.17 | 3.71 | 3.25 | <.01 |
| Interfunctional Coordination | 4.44 | 4.13 | 2.30 | <.05 |
| Overall Market Orientation | 4.46 | 4.13 | 2.33 | <.05 |

Table two shows there are differences in levels of customer orientation and market orientation toward students between the academic vice-presidents and the business school deans. The market orientation scores for each of the four dimensions of measurement are higher for the

vice-presidents than for the deans. In three of the four dimensions, the differences in mean scores are statistically significant.

Table three reports the market orientation scores toward students of the academic vice-presidents and business school accounting department chairs. Additionally, the table shows t-test results for differences in the mean scores between the two groups of administrators. In these comparisons, vice-presidents were found to have higher and statistically different market orientation scores in all four components of market orientation, to include the customer orientation dimension.

| Table 3: Means and t-test Results for Academic VPs and Accounting Departments Chairs | | | | |
|---|---|---|---|---|
| Customer Group: Students | | | | |
| Market Orientation Measurements (7 point scale) | | | | |
| Market Orientation Construct: | Academic VPs | Accounting Chairs | t-value | Significance |
| | *M* | *M* | | |
| Customer Orientation | 4.77 | 4.44 | 2.32 | <.05 |
| Competitor Orientation | 4.17 | 3.38 | 5.45 | <.01 |
| Interfunctional Coordination | 4.44 | 3.70 | 5.10 | <.01 |
| Overall Market Orientation | 4.46 | 3.84 | 4.28 | <.01 |

Table four reports the market orientation scores toward students of the business school deans and the accounting department chairs. The table shows that the mean scores are higher for deans than accounting department chairs in each of the four market orientation dimensions. In three of the four dimensions, the scores of the deans were not only higher than the accounting chairs, but were higher by a statistically significant amount.

| Table 4: Means and t-test Results for Business School Deans and Accounting Departments Chairs | | | | |
|---|---|---|---|---|
| Customer Group: Students | | | | |
| Market Orientation Measurements (7 point scale) | | | | |
| Market Orientation Construct: | Business Deans | Accounting Chairs | t-value | Significance |
| | *M* | *M* | | |
| Customer Orientation | 4.55 | 4.44 | 0.82 | ns |
| Competitor Orientation | 3.71 | 3.38 | 2.46 | <.01 |
| Interfunctional Coordination | 4.13 | 3.70 | 3.20 | <.01 |
| Overall Market Orientation | 4.13 | 3.84 | 2.16 | <.05 |

Table 5 shows results when parents of students are used as the customer group and are compared to actual business customers, there are significant statistical differences in levels of market orientation between the business managers and the business school leaders (the academic vice-presidents, deans, and accounting department chairs).  The business managers reported market orientation mean scores that were higher in absolute terms than all of the school administrators in each of the four dimensions of market orientation.  Of the scores, statistically significant differences at the 0.01 level were found between the business managers and the school administrators in all 12 comparisons.  Hence we know that there are indeed differences between business managers and business school administrators in the levels of market orientation.

| Table 5:  Means and t-test Results for Accounting Department Chairs, Business School Deans and Academic Vice Presidents versus Specialty Business Managers | | | | |
|---|---|---|---|---|
| Market Orientation Measurements (7 point scale) | | | | |
| Customer Group:  Parents of Students | | | | |
| Market Orientation Construct: | Business Managers n=75 | Accounting Chairs n=102 | Business Deans n=141 | Academic VPs n=102 |
| | *M* | *M* | *M* | *M* |
| Customer Orientation | 5.05 | 2.47* | 2.59* | 2.80* |
| Competitor Orientation | 4.71 | 3.08* | 3.41* | 3.87* |
| Interfunctional Coordination | 4.53 | 2.97* | 3.55* | 3.81* |
| Overall Market Orientation | 4.77 | 2.84* | 3.20* | 3.49* |
| *significant at .01 compared to Business Managers | | | | |

| Table 6:  Means and t-test Results for Academic VPs and Business School Deans | | | | |
|---|---|---|---|---|
| Customer Group:  Parents of Students | | | | |
| Market Orientation Measurements (7 point scale) | | | | |
| Market Orientation Construct: | Academic VPs | Business Deans | t-value | Significance |
| | *M* | *M* | | |
| Customer Orientation | 2.80 | 2.59 | 1.42 | ns |
| Competitor Orientation | 3.87 | 3.41 | 3.11 | <.01 |
| Interfunctional Coordination | 3.81 | 3.55 | 1.76 | <.10 |
| Overall Market Orientation | 3.49 | 3.20 | 1.96 | <.10 |

Table 6 shows there are significant statistical differences in levels of market orientation toward parents of students between the academic vice-presidents and the business school deans. The market orientation scores in all four dimensions of measurement are higher for the academic vice-presidents than for the business school deans. In three of the four dimensions, the differences were statistically significant at the 0.10 levels.

Table 7 reports the market orientation scores toward parents of students of academic vice-presidents and accounting department chairs. Additionally, the table shows tests for differences in the mean scores of the vice-presidents and the accounting department chairs. In these comparisons, academic vice-presidents were found to have higher market orientation scores in all of the four components of market orientation. The differences in mean scores were statistically significant for each of the four components of marketing orientation.

| Table 7: Means and t-test Results for Academic VPs and Accounting Departments Chairs | | | | |
|---|---|---|---|---|
| Customer Group: Parents of Students | | | | |
| Market Orientation Measurements (7 point scale) | | | | |
| Market Orientation Construct: | Academic VPs | Accounting Chairs | t-value | Significance |
| | *M* | *M* | | |
| Customer Orientation | 2.80 | 2.47 | 2.04 | <.05 |
| Competitor Orientation | 3.87 | 3.08 | 4.88 | <.01 |
| Interfunctional Coordination | 3.81 | 2.97 | 5.19 | <.01 |
| Overall Market Orientation | 3.49 | 2.84 | 4.02 | <.01 |

| Table 8: Means and t-test Results for Business School Deans and Accounting Departments Chairs | | | | |
|---|---|---|---|---|
| Customer Group: Parents of Students | | | | |
| Market Orientation Measurements (7 point scale) | | | | |
| Market Orientation Construct: | Business Deans | Accounting Chairs | t-value | Significance |
| | *M* | *M* | | |
| Customer Orientation | 2.59 | 2.47 | 0.81 | ns |
| Competitor Orientation | 3.41 | 3.08 | 2.23 | <.05 |
| Interfunctional Coordination | 3.55 | 2.97 | 2.30 | <.05 |
| Overall Market Orientation | 3.20 | 2.84 | 1.83 | <.10 |

Table 8 reports the market orientation scores toward parents of students of the business school deans and the accounting department chairs. In each of the four components of market

orientation, the deans reported higher mean scores than did the accounting department chairs. Statistically significant differences were found in three of the four dimensions.

A synopsis of the eight tables shows that business managers report higher levels of market orientation toward customers than the educational leaders report toward students and parents of students. This may be an indication that higher education administrators either do not view students and parents of students as customers, or that the implementation of the marketing concept has not been embraced within business school administrations, or both. It is particularly interesting to note that the higher up the administrator is within the education hierarchy, the higher the levels of reported market orientation and customer orientation toward students and parents of students. This certainly indicates that the implementation or the perceived level of importance of the marketing concept differs across the various levels of higher education administration. For a strategy such a market orientation to be successful, theory suggests that a strategy must be implemented across all levels of the organization. This seems to be lacking in the case of business school administration.

## IMPLICATIONS

These findings demonstrate that businesses perceive a greater importance and have made greater progress in the implementation of the marketing concept vis-à-vis university schools of business as perceived by their academic vice-presidents, deans and accounting department chairs. If, as previous research has found, organizations can improve their effectiveness by increasing levels of market orientation, university schools of business would seem to have ample opportunity to improve.

As the academic vice-presidents, deans and the accounting department chairs reported lower levels of market orientation in their organization than did their business counterparts, a significant opportunity would seem to exist for schools that will put more effort into their market orientation. As students of the university may be viewed as the most visible of the numerous customer markets served, market orientation efforts focused at students would seem to have the potential for the fastest and highest payoff. Examples of such payoffs might include:

* An increase in enrollment within the business school
* An increase in the hit rate (increase in percent of applicants that actually enroll)
* An increase in the number of business/accounting majors
* An increase in the retention rate of current business/accounting students
* An increase in future giving by alumni
* An improvement in rankings by outside organizations

The enhancement of market orientation toward the parent group could also pay dividends to the university. Additional parental involvement with the university should lead to the following:

* Increased participation in the educational process with their students
* A building of goodwill that might benefit the school in future recruiting, retention, and fund raising efforts
* Increased donations by parents to the programs of the school
* Increase feedback from another customer group of the school which might improve school programs
* Enhanced parental impact on the purchase decision when a student selects a college

In view of Narver and Slater (1990) and Kohli and Jaworski (1993) findings that enhanced levels of market orientation will improve the competitive advantage of organizations, business schools appear to be organizations ripe to take advantage of the market orientation concept. Focus on creating market orientation culture should serve both schools and their various stakeholders in more effectively achieving the school mission.

Our conclusions are tempered by the finding of Noble, Sinha, & Kumar (2002) that there appears to be no single strategic orientation that leads to superior performance in every case and as previously stated, building a market orientation culture within an organization is not a quick fix but rather a continuous process.

## FUTURE RESEARCH

The research we report suggests several needs for additional research. For example, research should be undertaken to examine the impact or influence that variables such as size of a school, school affiliation (AACSB, ACBSP, or neither), admission standards, the gender of administrators, placement efforts, or recruiting efforts have on market orientation. Additionally, research on other stakeholders associated with schools of business would be useful. Such research would further our understanding of the market orientation construct and its application to higher education.

Additional research in organizational culture including that of market orientation should be conducted in other non-profit organizations. Of particular interest would be an expansion of this line of research into other areas of higher education, into governmental agencies that provide services to the public, and into the non-profit side of the healthcare industry.

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# APPENDIX

15 of 30 Survey Questions Sent to Accounting Department Chairs, Business School Deans, and Academic Vice-Presidents of AACSB Schools of Business Administration

1. Our objectives are driven by satisfaction of our students.
2. We measure satisfaction of our students systematically and frequently.
3. Those responsible for recruiting students regularly share information within our business school/institution concerning competitor's strategies.
4. Our market strategies (such as recruiting and retention) are driven by our understanding of the possibilities for creating value for our students.
5. We respond rapidly to competitive actions that threaten us.
6. We constantly monitor our level of commitment and orientation to students.
7. University administration regularly discusses competitors' strengths and strategies.
8. All levels of administration understand how the entire institution can contribute to creating value for students.
9. We give close attention to service of students after enrollment.
10. Our strategy for competitive advantage is based on our understanding of our students needs.
11. We encourage other staff and faculty outside of recruiting/administration to meet with our prospective students and their parents.
12. All of our departments are responsive to and integrated in serving students.
13. Information on recruiting successes and failures are communicated across functions in the business school/institution.
14. We share information and coordinate resource use with other units in the institution.
15. We target potential students where we have, or can develop a competitive advantage.

Each question answered on a 7 point scale: 1=Not At All, 7=to An Extreme Extent. Questions 1, 2, 4, 6, 9, and 10 relate to the Customer Orientation construct/dimension, Questions 3, 5, 7, 11, and 15 relate to the Competitor Orientation, Questions 8, 12, 13, and 14 relate to Organizational Coordination. The Overall Marketing Orientation score is computed by averaging the mean scores of the other three sets of questions.

The other 15 Survey Questions noted in the paper were as above except the word "students" was replaced by the phrase "parents of students", where appropriate.

# COMPARING BUSINESS FACULTY'S SALARIES BY RANK AND GENDER: DOES AACSB ACCREDITATION REALLY MAKE A DIFFERENCE?

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## ABSTRACT

*Data made available to the public through the Missouri Secretary of State's Office, via its website, was used to test for differences in salaries as a hygiene factor among business faculty teaching at ten Missouri State funded universities. One-Way ANOVA tests showed means differed significantly between gender and among ranks, with p <.01 in most cases. The findings revealed that collegiate schools of business accredited by the Association to Advance Collegiate Schools of Business International (AACSB) were significantly different at providing higher salaries across ranks; however, women earned 85 cents to every dollar earned by men. Despite this downside, AACSB accreditation really does make a big difference.*

## INTRODUCTION

Once collegiate business schools have achieved accreditation recognition through the Association to Advance Collegiate Schools of Business International (AACSB), there is the burden of proof for maintaining the more rigorous standards imposed on the academic program offerings. One of the hardest things for business school deans—and their department heads—to do is not dissatisfy their faculty members, a factor, arguably, that is directly related to the production of intellectual contributions of a reasonable (measureable) quantity and quality.

Frederick Herzberg was a psychologist whose writings popularized "enrichment theory." We know from Herzberg, Mausner and Snyderman (1959) and Herzberg (1964) that motivation and dissatisfaction are different factors. Herzberg (1964) included salary among the list of hygiene factors, i.e., fringe benefits, status, job security, and salary. These factors do not cause positive satisfaction, but their absence results in dissatisfaction. Herzberg used the term "hygiene" within the context of human motivation and job enrichment. He surmised, correctly, that factors at work that motivate people are different and not simply the opposite of the factors that dissatisfy people. Therefore, it is easy to construe from this theory that a faculty member can be not "dissatisfied" with salary but also not necessarily "motivated" or "satisfied" with the work he or she does in general. (1964)

This is often the case with tenured faculty members (who already have job security and status   hygiene) but whose ICs are so low that they cannot be classified as professionally qualified (PQ) or academically qualified (AQ) by even the most liberal standards. They seem perfectly satisfied doing the mundane and, with very moderate, if any annual pay increases. Thus, it is possible to hypothesize that since AACSB is imposing higher standards, one of which is a financial commitment from administration, including university presidents, that AACSB accredited business schools should be more hygienic when it comes to salary, status (rank), and security (tenure). We can surmise in most cases that annual merit pay increases, tenure appointments, and promotion through the ranks will include considerations of a faculty member's research productivity, especially at AACSB accredited business schools.

Anyone chairing a faculty development committee knows all about the proof required from faculty members on the tenure-track or those up for post-tenure review; they must submit to the committee their dossiers including peer reviewed publications, peer-reviewed proceedings, peer reviewed paper presentations, and other intellectual contributions. What business schools are doing to make continuous improvements on "closing the loop" on weaknesses in their programs—accomplishments consistent with the standards that must be documented year-to-year in annual maintenance reports—is essential to maintaining AACSB accreditation.

Faculty members' intellectual contributions are the justification for graduate programs in many cases, even at business schools whose missions are primarily teaching. Nonetheless, all-to-often schools of business have limited resources and a host of budget constraints that directly affect the salary hygiene factor that directly impact faculty members' intellectual contributions, i.e., money for conference travel, publication and pages fees reimbursed, sponsoring symposiums, and special incentives for publishing in top-tier journals.

Are these AACSB accredited business schools using salary and promotion to quash dissatisfaction among the ranks and between genders? We wanted to know that since AACSB imposes more rigorous standards on the business schools it accredits and whether these AACSB business schools also provide more stable salary, security, and status as hygiene across rank and gender.

## AACSB RELATED LITERATURE

Studies abound about the need for research and publishing in colleges of business nationwide.  This is most evident in schools which are accredited or seeking initial accreditation as well as for maintenance of their accreditation status.  AACSB states in its white paper that faculty should be "active scholars through their research and other development activities that support the maintenance of their intellectual capital in the teaching field." (2006, p.1)   The Association further reports that faculty members who are actively engaged in research are more likely to remain current in their teaching discipline and that, in turn, results in enhanced teaching effectiveness and student learning (AACSB, 2008).  This result does not resonate with most

academicians.   Although the idea that research enhances teaching is popular, there is little empirical evidence to support this claim per Gibbs (1995).   Faculty members in teaching institutions who are pressured to do research continually tend to put less emphasis on teaching. (Marsh & Hattie, 2002)  They conclude that "time on research is related to research productivity but not teaching effectiveness, whereas time on teaching is not related to teaching effectiveness but may be negatively related to research productivity." (p. 613).

While a faculty member may feel unfavorable about conducting research in general, he or she would be motivated to do so nonetheless because it is the socially desirable and normatively appropriate behavior within his or her department or college states (Stanton, Taylor, & Stanaland, 2009).  With adequate resources available, graduate assistants or time off, to assist in research activities, this may heighten perception of the required research activity.   Research institutions readily provide such resources to their faculty members, but this is rarely the case in teaching institutions.  It is generally known that the more peer-reviewed publications a faculty member has, the more he or she is rewarded in merit increases, perks, or higher salaries.

Hedrick, et.al (2010) stated that AACSB accreditation is a mark of distinction for academic programs.  They reported that the goal of accreditation is to improve the quality of business programs, yet some skeptics contend that the aim is to increase business faculty salaries, perhaps at the expense of other academic programs.  They found that faculty at accredited institutions earn more, teach less, and produce more research and that the research output is measured by refereed articles.  Supporting this aim is Levernier and Miles's (1992) finding that faculty members at AACSB-accredited institutions earn higher salaries.

The AACSB status tends to be a deciding factor in negotiating with higher administration for facilities, talent maintenance, and talent acquisition.  One might expect the "publish or perish" institutions to have the strongest subjective norms usually.  Naturally, from an institutional point of view, the research productivity of the university's faculty results in increasing status of the institution and in securing grant dollars.  (Taylor & Stanton, 2009) Perhaps is may be more prudent to examine the relationship between faculty members' attitudes toward research and its impact on teaching effectiveness.

The role of publishing in academia has been historically to provide a venue for academic discourse and the dissemination of newly created knowledge.  But due to the new paradigm in business schools that are AACSB accredited, seeking reaccreditation, as well as candidacy schools for AACSB accreditation, AACSB Standards 10 and 2, define faculty as AQ (academically qualified) and PQ (professionally qualified), academic publishing has been even more highly prioritized.  The result is to require a higher percentage of faculty members to actively engage in research and to publish their research in peer-reviewed journals.  Thus, one can assume that this shift has resulted in a need to publish purely for the sake of publishing to get the merit increases and/or higher salaries.  The findings of Taylor and Stanton's (2009) study of faculty members in AACSB accredited business schools revealed that faculty would spend less time in scholarly publication pursuits if it did not have such a strong impact on their job security

and that securing a publication is often more important than providing a contribution to the advancement of their business discipline.

Administrators also have increased publication expectations for their faculty members with a trend toward more weight on scholarly activities (Alshare, Wenger & Miller, 2007). It would appear that teaching effectiveness has taken a back seat in administrators' quest to close the loop. According to Roberts, Johnson, and Groesbeck (2006), an increased emphasis on research and publications comes at the price of placing less value on teaching. Their study found that newly hired faculty at AACSB accredited institutions value research more than established faculty members.

A substantial body of literature exists which has analyzed, debated, and theorized about the research activity, teaching success, and effectiveness. Jenkins (2004) conducted a review of the literature through 2004 and did not find persuasive evidence that research improves teaching. Bennis and O'Toole (2005) have stated that business schools are measuring themselves almost solely by the rigor of their scientific research rather than on good teaching in the classroom by the faculty member and student interaction or outcome.

Corcoran (2006) reported that under AACSB "mission driven" standards, three tiers of business programs have emerged, namely doctoral, master, and baccalaureate levels. These institutional differences are large and varied, but faculty perceptions are quite similar, regardless of program tier. He stated that the common bind of these diverse programs is measured less in terms of resources and more in terms of a shared ethic of mission-driven excellence.

One of the most visible consequences of AACSB accreditation has been an increased focus on research. AACSB, Section 3 and Section 2 states the following:

> *The school's mission statement is appropriate to higher education for management and consonant with the mission of any institution of which the school is a part. The mission includes the production of intellectual contributions that advance the knowledge and practice of business and management. (p. 21)*

Thus, Standard 2 focuses on the body of IC (intellectual contributions) that is produced by the school's faculty as a whole with the goal of faculty maintaining currency in their respective fields by developing research and theory (AACSB International, 2008, p. 47). Herein are the terms used to justify maintenance of currency—AQ (faculty with a doctoral degree) or PQ (faculty with a master's degree and professional experience). With respect to IC expectations, it clearly indicates that they should be in writing, categorized, and prioritized (i.e., ranked) although they can be in many forms of output.

In the study by Smith, Haight, and Rosenberg (2009) that sought to examine AACSB member school processes for evaluating intellectual contributions and academic and professional qualification of faculty, they found that an overwhelming majority of schools ranked peer-reviewed journal articles as the most significant form of output; they conclude that many schools

are still applying antiquated standards in their evaluation of faculty IC. IC is often translated as peer-reviewed journal articles and that using this one-size-fits-all approach often stifles creativity and deployment of faculty members in a manner that best leverages their individual talents in support of the school's mission.

One perceived consequence of AACSB accreditation is that the character of the faculty changes in at least one respect: new hires value research more. It is not clear whether or not this means they also value teaching less. Faculty hired after accreditation do not believe so, but established faculty do (Roberts, Johnson, & Groesbeck, 2004).

Terpstra and Honoree (2009) argue that an institution's formal or public statement regarding the relative emphasis given to teaching versus research may actually differ markedly from the actual relative emphasis. They purport that the actual emphasis may be better addressed by the reward structure in place. For example, an institution may formally state that good teaching is of the utmost importance, yet the organizational rewards (such as merit pay, tenure, promotion) may be based primarily on research accomplishments. Their research on the effects of different teaching, research, and service emphases on individual and organizational outcomes in higher education institutions revealed that the most common faculty emphasis was one that stressed research. Larger institutions were more likely to emphasize research (52%) than teaching (4%), whereas private institutions were more likely to emphasize teaching (21%) than research (14%). The most common emphasis for private institutions was one in which research, teaching, and service was given equal weight (30%). Public institutions were more likely to emphasize research (37%) than teaching (13%). (p. 171-172) Although AACSB faculty members publish more research than non-AACSB, are their salaries higher? Are they satisfied?

**AACSB FACULTY SALARIES, SATISFACTION**

Terpstra and Honoree (2004) concluded from their findings that faculty are most satisfied with their jobs and pay when research and teaching are given equal weight. Further, they found that institutions that primarily emphasize teaching fare poorly in terms of faculty teaching effectiveness, research performance, job and pay satisfaction, and recruitment and retention. Their findings suggest that state legislatures, higher education boards, accrediting bodies, and academic administrators may consider changes that would allow faculty to focus more exclusively on teaching and research.

Agarwal and Yochum (2000) suggested that, on average, there is a $14,000 salary premium for finance faculty in AACSB schools. Levernier, Miles, and White (1992) did an empirical assessment of AACSB's Annual Salary Surveys (AACSB 1985-1991) and found additional positive support for the accreditation premium. In addition, faculty perceive that accreditation tends to be associated with a superior level of resources that includes extensive library holdings and data-bases, lower teaching loads, colleagues actively engaged in research, and greater research funding. Faculty at AACSB accredited colleges and universities have

become accustomed to the "accreditation premium," the compensation premium for being affiliated with an AACSB accredited school of business. Likewise, administrators at such schools have also become accustomed to the "accreditation premium" as reported by White, Levernier, and Miles (2006).

With accreditation, salary gaps between existing business faculty and newly hired academicians can be very large, and this can cause problems with existing faculty and with university administrators. Not insignificantly, faculty in other disciplines outside of business, who do not like the salary gap as it is, may become even more upset when market salaries for new AACSB-appropriate faculty starts to take place.

In Heriot, Austin, and Franklin's (2009) study to identify the costs for initial AACSB accreditation, they state that the benefits include certification of standards of excellent, signaling quality to students, and higher faculty salaries (Pastore, 1989). At present, there are 560 AACSB-accredited schools worldwide; however, there are more than 2,000 schools or college of business in the United States alone, with thousands of more potential member schools worldwide (AACSB International, 2009). They report that with AACSB accreditation comes an annual increased operating cost, such as additional faculty, professional development, etc. These two areas alone result in significant costs. It also provides an external validation of quality of faculty, current business curriculum, and continuous improvement.

In today's global environment, the quality assurance that AACSB provides is likely to be more valuable than ever. Given the multitude of business schools competing with each other around the world, a well-established brand like AACSB is vital for schools to demonstrate quality and can be a source of competitive advantage. Lastly, AACSB accreditation is a framework and process that increases the likelihood of a school meeting the needs of students, faculty, employers, and other constituents. Nonetheless, AACSB accreditation is obviously not the sole contributor to a school's success. Nor does accreditation guarantee that a school will innovate all of its set goals or satisfy all of its stakeholders according to Romero (2008).

Comm and Mathaisel (2003) found that satisfied employees are important for organizational performance. They argue employee satisfaction in higher education regarding workload, salary, and benefits can be used to improve academic quality; nonetheless, they reported that among faculty at a private college, most do not believe they are fairly compensated.

Moreover, Crothers, Hughes, Schmitt, Theodore, Lipinski, Bloomquist, and Altman (2010) report a difference in the job satisfaction negotiation techniques of male and female faculty members. They report that female faculty members earn significantly less than male faculty members, even when they controlled for years of experience. Females also reported a negative attribute of failed negotiations that they associated with their gender and vice versa when negotiations were successful.

In one study, Balkin and Gomez-Meji (2002) found that when male management professors received less pay raise than they expected, they tended to "quit" their institutions more so than their female colleagues. On the other hand, Hurtado and DeAngelo (2009) using

"data from the U.S. Department of Education's 2005 Fall Staff Survey," found that teaching load was a slightly stronger predictor than salary when it comes to retention of senior women. Lee and Martin (1996) found that switching jobs can affect satisfaction, too. When faculty members switched jobs from a high-tier institution to a low-tier institution, this can be a likely source of their pay dissatisfaction.

On the other hand, when Pfeffer and Langton (1993) investigated the effect of wage dispersion on satisfaction, productivity, and working collaboratively, they found that the greater the degree of salary dispersion within a department, the lower is satisfaction and research productivity. They state that faculty members also will be less likely to focus on collaborative research. The negative effects of wage dispersion on satisfaction can be reduced by experience and scholarly productivity in more developed fields.

Li-Ping, Tang, Sutarso, and Tang (2004) asked "Does the love of money moderate and mediate the income-pay satisfaction relationship?" They answered yes! Faculty members who reported a high-love-of-money had low satisfaction when they earned less than $89,139.53 and more satisfaction when they earned more than $89,139.53. Despite the fact the literature seems to be saying that AACSB accredited business school faculty members produce more research and appear satisfied with their salaries, this still leaves room for finding answers to a few important questions.

## IMPORTANT RESEARCH QUESTIONS

Are the faculty at business schools better off with AACSB accreditation in terms of at least one of the hygiene factors—their salaries? Does the momentum of being promoted through the faculty ranks, regardless of AACSB accreditation, circumvent the need for a business schools to pursue AACSB accreditation?  Do professors rise to the rank of full professor more at AACSB accredited business schools?  Does being promoted to full professor add as much salary hygiene as AACSB accreditation?  Does AACSB accreditation disrupt or strengthen pay structure?  Or does AACSB accreditation interfere with salary dispersion?

To answer these questions directly, a comparison of officially reported budgeted salaries of business faculty teaching at AACSB accredited schools of business against those that do not was made. The AACSB publishes a host of reports on business faculty salaries.  In fact, each year there is an update on the national trends in business school faculties' salaries. This self-report data comes from international surveys administered by the AACSB that are completed by deans of member and non-member institutions. But rarely is any outside organization able to analyze this rich source of data for itself. The aforementioned literature appears to support five null hypotheses in reference to the research questions posed.

## Research Hypotheses

Comparing actual salary data of business faculty's affiliation with AACSB accredited business schools, their gender, and rank would reveal a truer picture in business schools. The research objectives were achieved by testing the following five null hypotheses:

*Hypothesis $_1$: There is no difference in the relative frequency (or percent) of Missouri collegiate school of business faculty members when their gender was compared to their ranks.*

*Hypothesis $_2$: There is no difference in the relative frequency (or percent) of Missouri business school faculty members when their rank is compared based on their teaching at an AACSB accredited business schools vis-à-vis not teaching at an AACSB business schools.*

*Hypothesis $_3$: There is no difference between the means of business schools accredited by the AACSB and those not accredited by the AACSB regarding the actual salaries business faculty members are earning at the ten Missouri collegiate schools of business sampled.*

*Hypothesis $_4$: There is no difference among the means of instructors, assistant professors, associate professors, and full professors regarding the actual salaries business faculty members are earning at the ten Missouri collegiate schools of business sampled.*

*Hypothesis $_5$: There is no difference between the means of males and females regarding the actual salaries business faculty members are earning at the ten Missouri collegiate schools of business sampled.*

## METHODOLGY

## Measurement of Variables

Although some believe that in social science research ratio level variables are "non-existent," the dependent variable in this study was faculty's salaries, which is a ratio measure, the highest level of measure. Stanley Smith Stevens in 1946 in his article titled "On the Theory of Scales of Measurement" proposed a theory that there are four scales of measure: nominal, ordinal, interval and ratio. Salary is a variable in possession of a non-arbitrary zero value: there is such a thing as a faculty having "no" salary, even among faculty members working. Some visiting professors will teach for free, just to get the experience, at some schools. Although in this study we found no faculty member who was earning a zero salary, salary in our measure could be zero and the zero value is not arbitrary.

## Sample, Data Collection, and Descriptive Statistics

The Secretary of State of Missouri provides access to all Missouri employees' salaries, free of charge, on its website. (http://www.sos.mo.gov/bluebook/2009-2010/default.asp) *The 2009-2010 Official Manual* is a comprehensive report on all the budgeted salaries for Missouri State employees, which includes faculties' salaries. Those persons who worked in a teaching or in a teaching-administrative capacity for any of the State funded Missouri universities for 2009-2010 were listed.

| Table 1: Descriptive Statistics on Institutions with Frequencies and Percents | | Faculty's Frequency | Percent | Cumulative Percent |
|---|---|---|---|---|
| **Institutions*** | Lincoln University = No | 12 | 3.9 | 3.9 |
| | Linn State Technical College = No | 5 | 1.6 | 5.5 |
| | Truman State University = Yes | 24 | 7.7 | 13.2 |
| | University of Central Missouri = Yes | 47 | 15.1 | 28.3 |
| | Northwest Missouri State University = No | 25 | 8.0 | 36.3 |
| | Southeast Missouri State University = Yes | 41 | 13.2 | 49.5 |
| | Missouri State University = Yes | 101 | 32.5 | 82.0 |
| | Harris-Stowe State University = No | 13 | 4.2 | 86.2 |
| | Missouri Southern State University = No | 24 | 7.7 | 93.9 |
| | Missouri Western State University = Yes | 19 | 6.1 | 100.0 |
| | Total | 311 | 100.0 | |
| **AACSB vs. Non-AACSB** | Non-AACSB Accredited Schools | 79 | 25.4 | 25.4 |
| | AACSB Accredited Schools | 232 | 74.6 | 100.0 |
| | Total | 311 | 100.0 | |
| **Gender** | Male | 199 | 64.0 | 64.0 |
| | Female | 112 | 36.0 | 100.0 |
| | Total | 311 | 100.0 | |
| **Faculty's Academic Rank** | Instructor | 55 | 17.7 | 17.7 |
| | Assistant Professor | 66 | 21.2 | 38.9 |
| | Associate Professor | 73 | 23.5 | 62.4 |
| | Full Professor | 117 | 37.6 | 100.0 |
| | Total | 311 | 100.0 | |
| **Administrators** | Non-Administrators | 275 | 88.4 | 88.4 |
| | Administrators | 36 | 11.6 | 100.0 |
| | Total | 311 | 100.0 | |
| *No = not AACSB accredited; and Yes = AACSB accredited. | | | | |

Once the entire list of salaries for the ten universities was printed out, the websites for each business schools was visited. Business faculty members listed on the websites had bios and in most cases photos of themselves. It was easy to code for gender based on photos and references to themselves as he or she. Although collecting and coding demographic and salary data this way took several days, it proved to be a very rich source of data. Presented in Table 1 are frequencies and percents of faculty members and administrators of the ten universities with business programs selected for this study. Sixty-four percent of the faculty members were male.

Nearly 38 percent of the faculty members were Full Professors, and 74.6 percent taught at an AACSB accredited business school or college of business. Five collegiate schools of business selected for this study were AACSB accredited and five were not AACSB accredited. Among the ten schools of business sampled in this study, there were 311 total business faculty—232 from AACSB accredited schools and 79 from non-AACSB accredited schools of business. Additional demographic variables are presented in Table 1.

## RESULTS AND FINDINGS OF THIS STUDY

Faculty members' demographic information was tallied by the respective university in which they worked. Data were analyzed using SPSS 15.0. The sample was deemed normally distributed because the sample exceeded 100 observations (Henry, 1990). Of the observed variables, 311 were counted: 275 teaching faculty non-administrative and 36 had administrative duties (directors, department heads or department chairs, or deans) across all ranks and disciplines. After assessing the descriptive data, the five null hypotheses were tested.

**Hypotheses Testing**

**Hypothesis 1**

There is a difference in the relative frequency (or percent) of Missouri collegiate school of business faculty members when their gender was compared to their ranks. A Chi-Square (p = .014) test shows the observed frequency is not the same when gender was compared to rank, with a critical value of 10.587 exceeding the 7.815 critical value found in the Chi-Square Table, with df = 3 and p= .05. Goodman and Kruskal tau =.034 when gender represented the dependent variable, assuming a null hypothesis. See Chi-Square findings in Table 2.

| Table 2:  Chi-Square Analysis of Gender * Rank Crosstabulation with Directional Measures | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Rank | | | | Total | |
| | | | *Instructor* | *Asst. Prof.* | *Assoc. Prof.* | *Full Prof.* | *All* | |
| Gender | Male | Count | 27 | 39 | 47 | **86\*\*** | 199 | |
| | | Expected Count | 35.2 | 42.2 | 46.7 | 74.9 | 199.0 | |
| | | % of Total | 8.7% | 12.5% | 15.1% | 27.7% | 64.0% | |
| | Female | Count | **28\*\*** | 27 | 26 | 31 | 112 | |
| | | Expected Count | 19.8 | 23.8 | 26.3 | 42.1 | 112.0 | |
| | | % of Total | 9.0% | 8.7% | 8.4% | 10.0% | 36.0% | |
| Total | | Count | 55 | 66 | 73 | 117 | 311 | |
| | | Expected Count | 55.0 | 66.0 | 73.0 | 117.0 | 311.0 | |
| | | % of Total | 17.7% | 21.2% | 23.5% | 37.6% | 100.0% | |
| Chi-Square Tests | | | | | | | | |
| | | Value | | df | | Asymp. Sig. (2-sided) | | |
| Pearson Chi-Square | | 10.587(a) | | 3 | | .014 | | |
| Likelihood Ratio | | 10.577 | | 3 | | .014 | | |
| Linear-by-Linear Association | | 10.441 | | 1 | | .001 | | |
| N of Valid Cases | | 311 | | | | | | |
| a) 0 cells (.0%) have expected count less than 5. The minimum expected count is 19.81. | | | | | | | | |
| Directional Measures | | | | | | | | |
| | | | | Value | Asymp. Std. Error(a) | Approx. T(b) | Approx. Sig. | |
| Nominal by Nominal | Lambda | Symmetric | | .003 | .024 | .135 | .893 | |
| | | Gender Dependent | | .009 | .066 | .135 | .893 | |
| | | Rank Dependent | | .000 | .000 | .(c) | .(c) | |
| | Goodman and Kruskal tau | Gender Dependent | | .034 | .021 | | .014(d) | |
| | | Rank Dependent | | .012 | .008 | | .009(d) | |
| | Uncertainty Coefficient | Symmetric | | .017 | .010 | 1.638 | .014(e) | |
| | | Gender Dependent | | .026 | .016 | 1.638 | .014(e) | |
| | | Rank Dependent | | .013 | .008 | 1.638 | .014(e) | |
| a) Not assuming the null hypothesis. b) Using the asymptotic standard error assuming the null hypothesis. c) Cannot be computed because the asymptotic standard error equals zero. d) Based on chi-square approximation. e) Likelihood ratio chi-square probability. | | | | | | | | |

As can be seen in Tables 2, rank is better at predicting gender frequency than gender is at predicting rank. In fact, rank explains nearly 3.4 percent of the error in the gender variable. Therefore, rank reduced the prediction error by 3.4 percent when gender is the dependent variable. Double asterisks indicate cell counts with five or more above the expected count. This evidence appears to confirm what is already suspected to be true, that is, male and female business faculty members are treated significantly different in the hierarchical structure of salary in Missouri State funded institutions within the business schools. Notice that male faculty members are significantly more frequent as full professors and females are significantly more frequent as instructors.

### Hypothesis 2

There is a difference in the relative frequency (or percent) of Missouri business school faculty members when their rank is compared based on their teaching at an AACSB accredited business schools vis-à-vis not teaching at an AACSB business schools. A Chi-Square (p = .016) test shows the observed frequency is not the same when faculty ranks were compared to AACSB accreditation vis-à-vis non-AACSB schools, with a critical value of 10.323 exceeding the 7.815 critical value found in the Chi-Square Table, with df = 3 and p= .05. Goodman and Kruskal tau =.033 when AACSB/non-AACSB represented the dependent variable, assuming a null hypothesis. Chi-Square findings are in Table 3.

As can be seen in Table 3, rank is better at predicting AACSB frequency than AACSB is at predicting rank. In fact, rank explains nearly 3.3 percent of the error in the AACBS variable. Therefore, rank reduced the prediction error by 3.3 percent when AACSB is the dependent variable. Double asterisks indicate cell counts with five or more above the expected count. This evidence appears to demonstrate business faculty members are more frequently promoted up the levels in the academic hierarchy when the school of business is AACSB accredited.

Notice that full professors at AACSB accredited schools are significantly more frequent than their counter parts at non-AACSB schools. In fact, the non-AACSB full professor observed cell count of 18 is much below its expected cell count of 29.7. Faculty members at non-AACSB schools appear to be stymied at the associate professor level in the hierarchy as they are far less frequent in the full professor expected count.

| Table 3: Chi-Square Analysis of AACSB * Rank Crosstabulation with Directional Measures | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Faculty's Academic Rank** | | | | | **Total** |
| | | | *Instructor* | *Asst. Prof.* | *Assoc. Prof.* | *Full Prof.* | *All* |
| **AACSB** | *No* | Count | **19\*\*** | 20 | 22 | 18 | 79 |
| | | Expected Count | 14.0 | 16.8 | 18.5 | 29.7 | 79.0 |
| | | % of Total | 6.1% | 6.4% | 7.1% | 5.8% | 25.4% |
| | *Yes* | Count | 36 | 46 | 51 | **99\*\*** | 232 |
| | | Expected Count | 41.0 | 49.2 | 54.5 | 87.3 | 232.0 |
| | | % of Total | 11.6% | 14.8% | 16.4% | 31.8% | 74.6% |
| Total | | Count | 55 | 66 | 73 | 117 | 311 |
| | | Expected Count | 55.0 | 66.0 | 73.0 | 117.0 | 311.0 |
| | | % of Total | 17.7% | 21.2% | 23.5% | 37.6% | 100.0% |

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 10.323(a) | 3 | .016 |
| Likelihood Ratio | 10.801 | 3 | .013 |
| Linear-by-Linear Association | 8.400 | 1 | .004 |
| N of Valid Cases | 311 | | |

a) 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.97

| Directional Measures | | | | | | |
|---|---|---|---|---|---|---|
| | | | Value | Asymp. Std. Error(a) | Approx. T(b) | Approx. Sig. |
| Nominal by Nominal | Lambda | Symmetric | .015 | .023 | .633 | .527 |
| | | AACSB Dependent | .000 | .000 | .(c) | .(c) |
| | | Rank Dependent | .021 | .032 | .633 | .527 |
| | Goodman and Kruskal tau | AACSB Dependent | .033 | .019 | | .016(d) |
| | | Rank Dependent | .014 | .008 | | .005(d) |
| | Uncertainty Coefficient | Symmetric | .018 | .011 | 1.698 | .013(e) |
| | | AACSB Dependent | .031 | .018 | 1.698 | .013(e) |
| | | Rank Dependent | .013 | .008 | 1.698 | .013(e) |

a) Not assuming the null hypothesis.
b) Using the asymptotic standard error assuming the null hypothesis.
c) Cannot be computed because the asymptotic standard error equals zero.
d) Based on chi-square approximation.
e) Likelihood ratio chi-square probability.

## Hypothesis 3

There is a significant difference between the means of business schools accredited by the AACSB and those not accredited by the AACSB regarding the actual salaries business faculty members are earning at the ten Missouri collegiate schools of business sampled. One-Way ANOVA results are shown in Table 4. The Eta Squared of .092 shows a moderate effect.

| Table 4: One-Way ANOVA Test on AACSB Vis-à-Vis Non AACSB * Salary# | | | | | | |
|---|---|---|---|---|---|---|
| AACSB Vis-à-Vis Non AACSB | | Sum of Squares | df | Mean Square | F | Sig. |
| Salary * All BUSINESS SCHOOLs | Between Groups | 12,632,823,576.690 | 1 | 12,632,823,576.690 | 27.654 | .000 |
| | Within Groups | 124,711,839,733.907 | 273 | 456,819,925.765 | | |
| | Total | 137,344,663,310.597 | 274 | | | |
| Analysis excluded all 36 faculty members with administrative duties: deans, department heads, directors, etc. | | | | | | |
| | | | | Eta | Eta Squared | |
| Salary * All BUSINESS SCHOOLs | | | | .303 | .092 | |
| AACSB | | Mean | | N | Std. Deviation | |
| No | | $64,751 | | **69** | $18,562 | |
| Yes* | | $80,384 | | 206 | $22,227 | |
| Total | | $76,462 | | 275 | $22,388 | |
| *AACSB accredited BUSINESS SCHOOLs faculty's salary mean is 19.45% above non-AACSB business schools salary mean | | | | | | |

## Hypothesis 4

There is a significant difference among the means of instructors, assistant professors, associate professors, and full professors regarding the actual salaries business faculty members are earning at the ten Missouri collegiate schools of business sampled. One-Way ANOVA results are shown in Tables 5a, 5b, and 5c. The three Tukey's HSD post-hoc comparisons showed all pair-wise comparison to be significantly different at p. <.001. This makes sense because salary increases with rank in all cases in a stair-step hierarchy. The Eta Squared for each of the three ANOVA tests was .611., .635, and .633; each shows a very strong effect.

| Table 5a: One-Way ANOVA Test on All Business Schools on Rank * Salary | | | | | | |
|---|---|---|---|---|---|---|
| All Business Schools | | Sum of Squares | df | Mean Square | F | Sig. |
| Salary * Rank | Between Groups | 83,951,078,559.460 | 3 | 27,983,692,853.153 | 142.032 | .000 |
| | Within Groups | 53,393,584,751.136 | 271 | 197,024,297.975 | | |
| | Total | 137,344,663,310.596 | 274 | | | |
| | | | | Eta | Eta Squared | |
| Salary * Rank | | | | .782 | .611 | |
| Rank | | Mean | | N | Std. Deviation | |
| Instructor | | $44,042 | | 52 | $9,574 | |
| Assistant Professor* | | $72,999 | | 64 | $18,624 | |
| Associate Professor** | | $81,198 | | 64 | $15,182 | |
| Full Professor | | $93,349 | | 95 | $11,458 | |
| Total | | $76,462 | | 275 | $22,388 | |
| *Assistant professors earn 89.90% of the salaries of associate professors at all business schools combined. **Associate professors earn 86.98% of the salaries of full professors at all business schools combined. | | | | | | |

| Table 5b: One-Way ANOVA Test on AACSB Accredited Business Schools Only on Rank * Salary | | | | | | |
|---|---|---|---|---|---|---|
| AACSB Accredited Business Schools | | Sum of Squares | df | Mean Square | F | Sig. |
| Salary * Rank | Between Groups | 64,279,880,905.962 | 3 | 21,426,626,968.654 | 116.976 | .000 |
| | Within Groups | 37,000,520,689.654 | 202 | 183,170,894.503 | | |
| | Total | 101,280,401,595.616 | 205 | | | |
| | | | Eta | | Eta Squared | |
| Salary * Rank | | | .782 | | .611 | |
| Rank | | Mean | N | | Std. Deviation | |
| Instructor | | $43,051 | 34 | | $11,257 | |
| Assistant Professor* | | $78,198 | 45 | | $17,964 | |
| Associate Professor** | | $85,866 | 45 | | $14,098 | |
| Full Professor | | $94,055 | 82 | | $11,040 | |
| Total | | $80,384 | 206 | | $22,227 | |
| *Assistant professors earn 90.06% of the salaries of associate professors at AACSB accredited business schools. **Associate professors earn 91.29% of the salaries of full professors at AACSB accredited business schools. | | | | | | |

| Table 5c: One-Way ANOVA on AACSB non-Accredited Business Schools Only on Rank * Salary | | | | | | |
|---|---|---|---|---|---|---|
| AACSB Accredited Business Schools | | Sum of Squares | df | Mean Square | F | Sig. |
| Salary * Rank | Between Groups | 14,833,926,823.638 | 3 | 4944642274.546 | 37.383 | .000 |
| | Within Groups | 8,597,511,314.652 | 65 | 132269404.841 | | |
| | Total | 23,431,438,138.290 | 68 | | | |
| | | | Eta | | Eta Squared | |
| Salary * Rank | | | .782 | | .611 | |
| Rank | | Mean | N | | Std. Deviation | |
| Instructor | | $45,912 | 18 | | $4,830 | |
| Assistant Professor* | | $60,686 | *19* | | $14,056 | |
| Associate Professor** | | $70,141 | 19 | | $11,721 | |
| Full Professor | | $88,898 | 13 | | $13,450 | |
| Total | | $64,751 | 69 | | $18,562 | |
| *Assistant professors earn 86.52% of the salaries of associate professors at non-AACSB accredited business schools. **Associate professors earn 78.90% of the salaries of full professors at non-AACSB accredited business schools. | | | | | | |

### Hypothesis 5:

There is a significant difference between the means of males and females regarding the actual salaries business faculty members are earning at the ten Missouri collegiate schools of business sampled. One-Way ANOVA results are shown in Tables 6a, 6b, and 6c.

| Table 6a:  One-Way ANOVA Test on All Business Schools on Gender * Salary | | | | | | |
|---|---|---|---|---|---|---|
| All Business Schools on Gender | | Sum of Squares | df | Mean Square | F | Sig. |
| Salary * Gender | Between Groups | 8,499,217,424.029 | 1 | 8,499,217,424.029 | 18.008 | .000 |
| | Within Groups | 128,845,445,886.567 | 273 | 471,961,340.244 | | |
| | Total | 137,344,663,310.596 | 274 | | | |
| | | | | Eta | Eta Squared | |
| Salary * Gender | | | | .249 | .062 | |
| Gender | | Mean | | N | Std. Deviation | |
| Male | | *$80,664* | | 175 | 20744.28887 | |
| Female* | | $69,107 | | 100 | 23348.22149 | |
| Total | | $76,462 | | 275 | 22388.78950 | |
| *Females earn 85.67% of the salaries of males at all the business schools combined. | | | | | | |

| Table 6b:  One-Way ANOVA Test on AACSB Accredited Business Schools on Gender * Salary | | | | | | |
|---|---|---|---|---|---|---|
| All Business Schools on Gender | | Sum of Squares | df | Mean Square | F | Sig. |
| Salary * Gender | Between Groups | 6892006427.928 | 1 | 6892006427.928 | 14.896 | .000 |
| | Within Groups | 94388395167.689 | 204 | 462688211.606 | | |
| | Total | 101280401595.616 | 205 | | | |
| | | | | Eta | Eta Squared | |
| Salary * Gender | | | | .261 | .068 | |
| Gender | | Mean | | N | Std. Deviation | |
| Male | | $84,807 | | 130 | 19593.17331 | |
| Female* | | $72,819 | | 76 | 24458.47375 | |
| Total | | $80,384 | | 206 | 22227.25218 | |
| *Females earn 85.86% of the salaries of males at the AACSB accredited business schools | | | | | | |

| Table 6c:  One-Way ANOVA Test on Non-Accredited AACSB Business Schools Only on Gender * Salary | | | | | | |
|---|---|---|---|---|---|---|
| Non-AACSB Business Schools on Gender | | Sum of Squares | df | Mean Square | F | Sig. |
| Salary * Gender | Between Groups | 2,014,091,690.420 | 1 | 2014091690.420 | 6.301 | .014 |
| | Within Groups | 21,417,346,447.869 | 67 | 319661887.282 | | |
| | Total | 23,431,438,138.290 | 68 | | | |
| | | | | Eta | Eta Squared | |
| Salary * Gender | | | | .293 | .086 | |
| Gender | | Mean | | N | Std. Deviation | |
| Male | | $68,696 | | 45 | 19469.18018 | |
| Female* | | $57,353 | | 24 | 14354.50462 | |
| Total | | $64,751 | | 69 | 18562.86542 | |
| *Females earn 83.48% of the salaries of men at the non-AACSB accredited business schools. | | | | | | |

## DISCUSSION

Among administrators, the highest paid person was a dean earning $191,872. The lowest paid administrator was an instructor serving as a chair earning $45,658. Excluding the 36 administrators, the lowest salary was an instructor earning $31,887; the highest salary was a full professor earning $134,896. The highest modal earning was for four full professors earning $110,000 each—all at AACSB accredited business schools. Among the 206 faculty members teaching at an AACSB accredited business schools, 76 were female with a mean salary of $72,820 and 130 were male with a mean salary of $84,807, a difference of $11,987. Among the 69 faculty members teaching at non-AACSB accredited business schools, 24 were female with a mean salary of $57,353 and 45 were male with a mean salary of $68,696, a difference of $11,343. Male faculty members at AACSB accredited business schools made an average earning of $16,111 more than male faculty members at non-AACSB accredited business schools; female faculty members at AACSB accredited business schools earned $15,467 more than female faculty members at non-AACSB accredited business schools. Male faculty members at AACSB accredited business schools earned an average of $27,454 more than female faculty members at non-AACSB accredited business schools; female faculty members at AACSB accredited business schools earned an average of $4,124 more than male faculty members at non-AACSB accredited business schools.

Female faculty members are earning significantly less than male faculty members in general; however, female faculty members at AACSB accredited business schools earn $4,124 more than male faculty members at non-AACSB accredited business schools and $15,467 more than female faculty members at non-AACSB accredited business schools. Male faculty members are promoted to full professor significantly more frequently than female faculty members; however, faculty members are more frequently represented at the higher ranks at the AACSB accredited business schools. At non-AACSB accredited business schools, faculty members are significantly concentrated at the instructor's level.

Salary among the faculty ranks at AACSB accredited business schools is significantly higher. Salary at AACSB accredited business schools is much higher between the genders and among ranks. It appears AACSB accredited business schools are more hygienic than non-AACSB accredited business schools when it comes to the salary, status, and security hygiene factors. Therefore, the lack of full professors at the non-AACSB accredited schools of business seems consistent with a weak or faulty evaluation process directly affecting pay structure among the ranks at these schools. It is difficult to determine just why non-AACSB business schools seem to stifle the promotion to full professor. We can surmise that since non-AACSB accredited business schools offer less of the salary hygiene, job security hygiene, and status hygiene among the ranks and between genders, they are more likely to have faculty who are dissatisfied than faculty working for AACSB accredited business schools.

## CONCLUSIONS

We can now provide answers to the aforementioned research questions:

1.  Are the faculty at a business schools better off with AACSB accreditation in terms of at least one of the hygiene factors—their salaries?

    Yes! Faculty members working for business schools accredited by the AACSB are better off than faculty members working for business schools not accredited by the AACSB in terms of their salaries. Moreover, the 69 faculty members at non-AACSB accredited business schools (both male and female) earned an average of $64,751; the 206 faculty members at AACSB accredited business schools (both male and female) earned an average of $80,394 or $15,593 more than faculty members at non-AACSB accredited business schools which suggests an "accreditation premium." These thousand dollar differences can translate into more than a million dollars over an academic career. Furthermore, job status (rank) and job security (tenure) hygiene were more prevalent at the AACSB accredited schools; rarely is a faculty member promoted to full professors and he or she does not have tenure.

2.  Does the momentum of being promoted through the faculty ranks, regardless of AACSB accreditation, circumvent the need for a business schools to pursue AACSB accreditation? Do professors rise to the rank of full professor more at AACSB accredited business schools?

    No! And, yes! Women are not being promoted as fast in the business schools. Female faculty members were clustered in the instructor rank, with a significant Chi-Square of $p = .014$. The expected count of 19.8 was exceeded by the observed count of 28 for instructors; however, the expected count for male faculty members at the full professor level was 74.9 and the observed count was 86. For female faculty members, the expected count for full professor was 42.1 and the observed count was 31. On the other hand, when a Chi-Square was run on AACSB accredited business schools versus non-AACSB accredited business schools on rank, the AACSB accredited business schools had a very high significant frequency of full professors. In fact, the expected count was 87.3 and the observed count was 99, with a $p = .016$. At the non-AACSB accredited business schools, the expected count for full professors was 29.7, but the observed count was only 18. This is pretty strong evidence that AACSB accreditation is having a very strong influence on the organization structure of the business schools, which includes documentation of

intellectual contributions of its faculty members, a critical component of any tenure appointment and promotion in rank.

3.  Does being promoted to full professor add as much salary hygiene as AACSB accreditation?

    Yes! The full professor average salary was $94,055 at AACSB accredited business schools. At non-AACSB accredited business schools, the full professor average salary was $88,898, which is more than the AACSB accredited business schools' overall salary average of $80,394. It seems that if a faculty member can rise through the ranks to full professor status; this promotion trumps AACSB accreditation status. The problem is that it is much more difficult to become a full professor at the non-AACSB accredited business schools. This is possibly due to the fact that non-AACSB accredited business schools lack the imposition of the AACSB standards that force these types of standardized evaluation mechanisms into place.

4.  Finally, does AACSB accreditation disrupt or strengthen pay structure or does it interfere with salary dispersion?

    AACSB accreditation strengthens pay structure and improves salary dispersion among the ranks! This accreditation apparently contributes to a more stable pay structure and improves the salary hygiene across the ranks. For all rank comparisons, the pay structure was obviously stair-step (large salary increases as a faculty member moves up in rank). This is why the Tukey's post-hoc comparisons were $p < .001$ on all paired comparisons. Associate professors at the AACSB accredited business schools earn 91 cents to every dollar full professors earn; however, at the non-AACSB accredited business schools, associate professors earn only 79 cents to every dollar full professors earn.

    Although female faculty at the AACSB accredited business schools earn 85 cents to every dollar of what their male counterparts earn, they still out earn on average what both male faculty and female faculty earn at the non-AACSB accredited business schools. At the non-AACSB accredited business schools, female faculty earn 83% of what their male counterparts earn. Female faculty at AACSB accredited business schools earn $15,467 more than female faculty at non-AACSB accredited business schools. Female faculty at AACSB accredited business schools earned an average of $4,124 more than male faculty at non-AACSB accredited business schools.

    Although the interpretations of the findings in this study are limited to the ten publicly funded Missouri institutions sampled, the findings confirm much of the puffery surrounding seeking and receiving AACSB accreditation. Spending the resources to

apply for and eventually receive AACSB accreditation is apparently good for faculty across ranks and gender. Even though female faculty earn 15% less than their male counterparts at the AACSB accredited business schools, on average they fare better than both male and female faculty at the non-AACSB accredited business schools regarding the salary hygiene.

AACSB accreditation means that faculty will earn more money on average, experience less dispersion in salary among the ranks, have a much greater opportunity to be promoted to full professor, and the business schools will be more hygienic when it comes to salary, status, and job security. Over a career, especially for new faculty members just beginning their careers, these annual salary differences can translate into a million or more dollars in accumulated wealth, including contributions to savings and retirement savings. Therefore, AACSB accreditation really does make a big difference.

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# USING STUDENT COURSE EVALUATIONS TO DESIGN FACULTY DEVELOPMENT WORKSHOPS

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### ABSTRACT

*Current practice is to administer end-of-course student evaluations and to use the results as part of a faculty member's annual teaching performance evaluation. Since the administration collects the data it ought to use it to help faculty improve their course evaluation scores. This may seem self-defeating but satisfied students not only rate the professor higher but likely rate the program and the university higher. In this era of external and public rankings of programs, this is important. Factor analysis can help administrators analyze student course evaluations and identify problem areas that can then be the targeted for faculty development programs and workshops.*

### INTRODUCTION

Teaching consumes fifty percent or more of a professors time (Bowen and Schuster, 1986), yet professors are tenured, promoted and evaluated more on the basis of their research and scholarly activities than on their teaching. It may be too much to say that institutions of higher learning "have paid lip service" to the importance of teaching, or that "Policies, procedures and criteria for the evaluation and promoting of faculty in higher education contribute to the marginalization of teaching" (Davidovitch and Soen, 2006, p. 351). It is curious, however, why the activity that consumes so much time, and is seen by many outside the academy as the overarching objective of a college or university (namely, to educate students), is often of lesser importance when evaluating faculty performance.

It may be, at least in part, due to the reward structure outside of colleges and universities. As Kai Peters (2005, p. 150) wrote in a letter to the editor of the *Harvard Business Review*,

> business schools, through their accreditation systems, are driven to adhere to a common academic model that heavily emphasizes the number of articles their faculty members publish in first tier journals rather than the impact the research might have on practitioners. Opting out of this system carries high penalties for those institutions—possible loss of credentials, of degree awarding powers, of access to government funding.

It may also be because research and scholarly activity is easier to evaluate than is teaching. Most institutions count journal articles, consider the quality of the journals (often

using published rankings), how often articles are cited, how many conference presentations are made, how many funding grants have been applied for and received, and so on. This is not all that difficult, either conceptually or in practice.

Assessment of a professor's teaching effectiveness requires, as Graeme Decarie (2005) stated, "some standard measure of what students know before the course and what they know after." It may be too much to say, as Decarie then opined, "No one has the faintest idea how to do that." We do know how to do it: have some idea what is to be accomplished in the class before hand, administer a pre-test, administer a post-test, and compare the results. There may be professors, schools, colleges or universities that do something like this, but certainly outcomes based measures are not the standard procedure for evaluating a professor's teaching effectiveness. And even at just this, it certainly would be more involved than the current standard procedure for evaluating scholarly activities.

Instead, the current standard procedure at most institutions is to rely on one form or another of end-of-course student evaluation as an indicator of faculty teaching performance. As Seldin (1993) opined, "student ratings have become the most widely used – and, in many cases, the only – source of information on teaching effectiveness" (see, also, Wilson 1998 for a similar observation). And student evaluations are not outcomes based measures; they are largely satisfaction surveys.[1]

Using student course evaluations as input into personnel decisions about who to hire, hire back, tenure, and promote is controversial.[2] The purpose of the present paper is not to further contribute to the large literature regarding the validity and reliability (or lack thereof) of student evaluations, but to suggest that since we do administer them, and since there is zero likelihood that we will stop administering them, department chairs, program directors, deans and those responsible for faculty development programs should use the information collected for formative purposed. The student voice, while impacted by any number of variables, does say something regarding the instruction they have received and it ought not be ignored. While we should not mistake student course evaluations as an assessment of teaching effectiveness, we should fully appreciate that satisfied students may learn more but they certainly evaluate professors higher and, likely, have a higher opinion of the program, the school, the college or the university. In this age of external and public ranking of institutions, this should matters a great deal, and not only to faculty but to department chairs, program directors, deans, university provosts and presidents.

## FORMATIVE USE OF STUDENT EVALUATIONS

While most of the literature on student course evaluations focuses on their summative use, Centra (1993, Ch 4) does discuss their formative use. His focus is on how individual faculty members, striving to improve their own classroom instruction, can use the information provided by student evaluations. Centra emphasizes, however, that a professor may glean something from

course evaluations, believe the information credible, and be motivated to use the information, yet not know how to make changes called for by students.

There is evidence that those faculty that receive help make more progress than those that go it alone (Cohen 1980; Cohen and McKeachie 1980; Williams and Cici 1997). But even here the evidence is ambiguous. For example, Davidovitch and Soen (2006) evaluated their institution's attempt to promote quality instruction, as measured by student evaluations, by investigating a range of variables for their impact on student evaluation scores. One relationship they were interested in was the relationship between faculty participation in teaching workshops and the end-of-course student evaluation scores, something that had only recently been introduced at their institution.

They found, over a five-semester period, that there was significant improvement in student evaluation scores. They also found no correlation between participation in teaching workshops and scores on the student evaluations of teaching. In short, improvements in teaching "were not related to instructors' participation in teaching workshops" (p. 373).

Davidovitch and Soen discussed several possible reasons for these surprising and certainly disappointing findings. One possible reason not discussed was that the topics for the teaching workshops were unrelated to what students were being asked to evaluate on their teacher and course evaluations.

## HOW WORKSHOP TOPICS ARE SELECTED

Like many colleges and universities, my institution conducts faculty teaching workshops. I asked one of the organizers in charge of a recent round of workshops how the themes or topics for workshops are chosen. I was told they "ask faculty what they want," that they "monitor IT help desk calls to identify problem areas," and that they "pay attention to 'hot topics' (for example, a current hot topic is digital copyright)." They also "sometimes have focus groups" with students.

Each of these approaches will probably provide a workshop that will be interesting and informative. But will they improve student opinion of, and satisfaction with, their classes? Not necessarily and only accidentally if the workshops are unrelated to what students are being asked to evaluate? Conducting focus groups with students is an appropriate strategy, but why collect new and original data from students when virtually every institution already and regularly surveys students about how professors perform and how well and what they like and dislike about their classes? The data are already collected; department chairs, deans, and those charged with faculty development activities should use it. Unfortunately, current practice at far too many institutions is to collect the data, calculate summary statistics, and provide these summary statistics and sometimes the raw data and the written comments to the faculty member, who is then left to do with them as he or she sees fit.

## STUDENT EVALUATION FORMS

Most student evaluation forms ask students to numerically rate a list of 15, 20, sometimes 30 classroom teaching performance traits. Some items are fairly specific (Instructor puts outline of lecture on board); others are more general (Class sessions are well planned). Student evaluation forms almost always include a general or overall evaluation of the instructor and/or of the course, and they almost always provide space for the student to write comments about the course and the way it was taught.

If instructors look at their course evaluations at all, they often turn to the overall evaluation items first and then to the written comments. Faculty look at the written comments for anecdotal insights and, as often as not, for confirmation of their own great performance. What they less carefully consider are the multiple individual items rated by students. Looking at 15, 20 or 30 items, rated by 20, 60 or more students, to ascertain how students rated various aspects of a professor and his or her course is much more difficult and time consuming than scanning the written responses for a quick sense impression.

The obverse is true when a department, school, college or division within a university is looking at several thousand evaluations for several hundred courses. Reading, coding, and making sense of the written comments would be a daunting task; statistically analyzing a series of rating scales is much easier.

## STATISTICALLY ANALYZING COURSE EVALUATIONS

The statistical analysis of student course evaluations that I have seen are limited to the calculation of the number and proportion of responses in each response category for each item on the form and the calculation of the average response for each item. These are presented to the instructor, sometimes accompanied by the same calculations for the department or for the school. Occasionally they are even accompanied by results from peer schools if the evaluation forms are administered and analyzed by an outside vendor.

A recent analysis I received for a course I taught at another university during summer 2008 will serve as an illustration (see Table 1, below).

| Table 1: Instructor Score Analysis | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Number of Responses | Average Response |
| 1. Instructional methods enhanced my analytical problem solving skills | 0 | 1 (5.88%) | 5 (29.41%) | 9 52.94%) | 2 (11.76%) | 17 | 3.71 |
| 2. The instructional methods enhanced my critical thinking skills | 0 | 0 | 2 (11.76%) | 10 (58.82%) | 5 (29.41%) | 17 | 4.18 |
| | Very Poor | Poor | Neutral | Very Good | Excellent | Number of Responses | Average Response |
| 7. Instructor's effectiveness in conducting the class | 0 | 0 | 4 (23.53%) | 9 (52.94%) | 4 (23.53%) | 17 | 4.00 |
| 10. Instructor's knowledge of material and subject | 0 | 0 | 1 (5.88%) | 9 (52.94%) | 7 (41.18%) | 17 | 4.35 |
| | 1 | 2 | 3 | 4 | 5 | Number of Responses | Average Response |
| 11. Rate the degree to which the course met your expectations | 1 (5.88%) | 1 (5.88%) | 2 (11.76%) | 7 (41.18%) | 6 (35.29%) | 17 | 3.94 |

Had I been a regular member of the faculty, I would have also received a summary average representing my own history of ratings for each of the thirteen items on their form, a similar average for the school in which the course was taught, and a similar average for the division of the university within which the school was housed.

What is an instructor to do with this data? Presumably one can look at one's performance on any one item and compare it with the performance of others or even with one's own historical performance. Do you do better than others? Do you do worse? Are you getting better? Are you getting worse? How this information can be used for self-improvement is not obviously clear. As Centra pointed out, faculty members often do not know how to make the changes called for by the students?

Presently far too many institutions use such simple data analysis of student course evaluations, and often considering only the overall evaluation score(s), as an indication of teaching performance and as input into personnel decisions. This paper suggests that administrations – department chairs, program administrators, deans – can use the information already collected, by way of student course evaluations, to help plan and design faculty development activities and workshops that will actually help improve scores on student course evaluations. A more sophisticated analysis of the data is necessary, however.

## USING FACTOR ANALYSIS

Factor analysis is well suited for exploring the interrelatedness between multiple questions asked on a typical course evaluation instrument. By applying an advanced form of correlation analysis to the responses received, a list of 15, 20 or 30 items can be reduced to just a few characteristics that students might, themselves, have difficulty identifying.

The adage in correlation analysis is that correlation does not imply causation. This helps to conceptualize what is at work in factor analysis. Correlation does not imply causation because a third variable may be the unmeasured (or latent) cause of the observed fluctuation and variation in the two measured variables. Factor analysis is a way to identify that third, unmeasured variable (or factor).

As an analytical technique, factor analysis relies on overlapping correlations, searching for patterns of co-variation among the variables. If an instrument has eleven questions, and the responses to five of them co-vary together, the idea is that they each measure the same underlying construct, or "factor." If the other six co-vary together, they are measuring another underlying construct. Thus, eleven "variables" are reduced to two "factors." Examining the items that co-vary together, that "load" on a "factor," for what they have in common provides an understanding of the underlying construct. When applied to 15, 20 or 30 variables, the process "reduces" the many to a few. The end result is easier interpretation and action.

It must always to be remembered that factor analysis is an exploratory tool. Further, it works only on the questions that have actually been asked. If critical questions are not on the course evaluation form, or if the wrong questions have been asked, factor analysis cannot identify characteristics that would have been identified if a different set of questions had been asked. Based on the actual questions asked of students, it identifies what sub-groups of questions are tied together, and, in the minds of the students, what ties them together.

The problem at hand is to analyze student course evaluations such that the student voice is heard and faculty development workshops can be planned that actually address student issues and, thereby, help faculty improve their student evaluation scores. If students are metaphorically screaming answers to 15, 20 or 30 different questions, it will be hard for a faculty development office to hear what they are saying. If students will slow down and consolidate their thoughts into fewer "factors," it will be easier for a faculty development office to understand. That, in essence, is what applying factor analysis to student course evaluations attempts to do, after the fact.

## THE ANALYSIS

For the present analysis and illustration, course evaluation data from my School of Business Administration was used. At the time of this study our course evaluation instrument was administered as a pencil-and-paper questionnaire using a Scantron form for their reply. It consisted of eighteen ungrouped statements (see Table 2, below). Although the instrument is now administered online, it consists of the same eighteen ungrouped statements. Using a 5-point scale, anchored with Strongly Disagree (1) and Strongly Agree (5), students indicate the extent to which they agree or disagree with each statement. These eighteen items are followed by two general overall evaluation questions. The first is an overall evaluation of the instructor; the second an overall evaluation of the course. The overall ratings use a 5-point ordinal scale

(Excellent, Good, Satisfactory, Poor, and Very Poor) to record the student response. Because each of these five response categories is presented in association with a number (Excellent = 5, etc.), they are treated by my institution as interval measures.

| Table 2* |
|---|
| Items 1-18 are rated on a five-point scale with 1=Strongly Disagree and 5=Strongly Agree. |
|   1.  The goals of the course were clearly expressed at the beginning of the term. |
|   2.  What was actually taught was consistent with the goals of the course. |
|   3.  The course syllabus clearly explained the basis for determining grades. |
|   4.  The instructor followed the stated basis for determining grades. |
|   5.  The instructor communicated in a clear, effective way. |
|   6.  The instructor was organized and prepared for class. |
|   7.  The instructor presented the material in an interesting, thought-provoking way. |
|   8.  The text and/or assigned readings contributed to my understanding of the subject. |
|   9.  Other assignments (papers, projects, homework, etc.) contributed to my understanding of the subject. |
| 10.  I received useful and timely feedback on my performance. |
| 11.  The amount of work demanded for this course was appropriate and reasonable. |
| 12.  The instructor used appropriate methods to evaluate my performance. |
| 13.  The instructor was fair in grading my performance. |
| 14.  The instructor was sensitive to students' varying backgrounds and academic preparations. |
| 15.  The instructor was caring and respectful of students. |
| 16.  The course stimulated my interest in the subject area. |
| 17.  The course helped me to develop intellectual skills, such as critical thinking or problem solving. |
| 18.  I have achieved my education goals for this course. |
| Items 19-20 are rated on the following scale:  5=Excellent  4=Good  3=Satisfactory  2=Poor  1=Very Poor. |
| 19.  Overall rating of instructor. |
| 20.  Overall rating of course. |
|  * The first 20 items are followed by two additional overall ratings, one for library resources and one for computer resources.  These are then followed by standard census items.  There are an additional four questions pertinent only to laboratory and clinical courses.  Questions 21-31 are not relevant to this analysis so their exact wording and response structure is omitted. |

The initial data set consisted of two years of course evaluations. There were 701 classes and 20,877 evaluation forms, both from undergraduate and graduate programs and from all departments. Although many faculty teach in both programs, only undergraduate evaluations were included in the analysis because the overall evaluation scores differ markedly between undergraduate and graduate classes. In addition, removed from the data set were all independent study classes, all classes with less than 10 students, and all classes in which fewer than half of the enrolled students completed a course evaluation form.

Since the problem at hand is one of using student course evaluations to aid in designing faculty development workshops, it was further decided to focus on those sections which students indicated were most in need of help. Quartile scores for each of the two overall ratings were calculated and only those courses that were in the fourth quartile on both the overall evaluation of the instructor and the overall evaluation of the course were selected for analysis. These are the instructors and courses that students evaluated lowest and, presumably, are the instructors and courses most in need of help (from the students' point of view). The final data set includes 3,146 evaluations, representing 103 sections. Because listwise deletion of variables was employed in the analysis, the final sample size was 3,017 student evaluations. The mean response to each of the eighteen variables in presented in Table 3, below.

| Table 3: Descriptive Statistics | | | |
|---|---|---|---|
| | Mean | Std. Dev | Analysis N |
| ITEM 1 Goals of course were clearly expressed | 4.03 | 1.018 | 3017 |
| ITEM 2 Material taught was consistent w/goals | 3.91 | 1.067 | 3017 |
| ITEM 3 Syllabus clearly explained basis for determining grades | 4.05 | 1.084 | 3017 |
| ITEM 4 Followed stated basis for determining grades | 4.09 | 1.036 | 3017 |
| ITEM 5 Instructor communicated in a clear, effective way | 3.36 | 1.291 | 3017 |
| ITEM 6 Instructor was organized and prepared for class | 3.97 | 1.112 | 3017 |
| ITEM 7 Material presented interestingly and thought-provokingly | 3.13 | 1.332 | 3017 |
| ITEM 8 Text or readings contributed to my understanding | 3.63 | 1.245 | 3017 |
| ITEM 9 Other assignments (papers, projects, homework) contributed | 3.63 | 1.210 | 3017 |
| ITEM 10 Student received useful and timely feedback | 3.78 | 1.171 | 3017 |
| ITEM 11 Amount of work was appropriate and reasonable | 4.01 | 1.039 | 3017 |
| ITEM 12 Instructor used appropriate methods for evaluation | 3.85 | 1.142 | 3017 |
| ITEM 13 Instructor was fair in grading performance | 3.94 | 1.114 | 3017 |
| ITEM 14 Instructor was sensitive to students' varying backgrounds | 3.92 | 1.169 | 3017 |
| ITEM 15 Instructor was caring and respectful of students | 4.11 | 1.114 | 3017 |
| ITEM 16 Course stimulated interest in the subject matter | 3.22 | 1.359 | 3017 |
| ITEM 17 Helped develop intellectual skills | 3.46 | 1.252 | 3017 |
| ITEM 18 Student achieved educational goals | 3.47 | 1.258 | 3017 |

Because the intent of the analysis is to reduce the set of measured variables (the 18 items on the course evaluation form) to a smaller set of underlying dimensions for the sake of parsimony and conceptual simplicity, Principal Components Analysis (PCA) was used to extract the factors. Because it is believed the resulting factors will be independent and because the desire is to produce a solution in which measured variables substantially load on only one factor rather than on several factors, verimax rotation was employed.

In the final solution, discussed below, five factors were kept. This number was arrived at through an iterative process. The initial analysis applied Kaiser's criterion that only factors with an eigenvalue of 1.0 or more be retained. This initial solution retained two factors, one of which can only be described as a global factor. Eleven of the eighteen items substantially load on it (.500 or greater). This factor was very difficult to interpret and did not provide much guidance for the practical problem at hand: developing faculty development workshops that address the issues in the minds of the students.

Subsequent iterations increased the number of factors to be extracted and rotated. In this iterative process an eye was kept on the stability of the factors with each iteration. The 3-factor solution split the largest factor of the 2-factor solution into two separate factors; the smaller of the two original factors remained stable. The 4-factor iteration removed two variables from the untouched smaller factor of the original 2-factor solution, producing a fourth factor. In all subsequent iterations this two-variable factor remained stable. The 5-factor iteration segregated two variables from one of the two factors generated in the 3-factor solution, creating a second two-variable factor; in all subsequent iterations this two-variable factor also remained stable. The 6-factor and the 7-factor solution each extracted one additional variable from the previous 4-factor solution, creating two additional one-variable factors.

The 5-factor solution was settled on for the present purposes. The "themes" or "factors" in the minds of the students that emerged follow:

* Whether or not the professor is stimulating, interesting, and thought provoking. (Communication Skills)

* Whether or not the course goals and the basis for determining grades are clear and followed. (Course Organization)

* Whether or not the actual workload and grading was fair and appropriate. (Evaluation)

* Whether or not the instructor was caring and respectful. (Personality)

   * Whether or not the texts, readings and assignments contributed to student
   understanding. (Assignments)
The final rotated solution is presented in Table 4, below.

| Table 4: Rotated Component Matrix | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| ITEM_16 Course stimulated interest in the subject matter | .836 | .171 | .229 | .162 | .201 |
| ITEM_7 Material presented interestingly and thought-provokingly | .775 | .284 | .093 | .251 | .217 |
| ITEM_17 Helped develop intellectual skills | .772 | .210 | .316 | .114 | .265 |
| ITEM_18 Student achieved educational goals | .719 | .250 | .388 | .184 | .198 |
| ITEM_5 Instructor communicated in a clear, effective way | .624 | .503 | .131 | .333 | .172 |
| ITEM_1 Goals of course were clearly expressed | .302 | .740 | .246 | .189 | .161 |
| ITEM_3 Syllabus clearly explained basis for determining grades | .112 | .732 | .455 | .076 | .127 |
| ITEM_2 Material taught was consistent w/goals | .399 | .712 | .243 | .186 | .196 |
| ITEM_6 Instructor was organized and prepared for class | .315 | .691 | .087 | .299 | .243 |
| ITEM_4 Followed stated basis for determining grades | .130 | .680 | .512 | .193 | .124 |
| ITEM_13 Instructor was fair in grading performance | .260 | .334 | .711 | .325 | .152 |
| ITEM_12 Instructor used appropriate methods for evaluation | .325 | .331 | .705 | .279 | .192 |
| ITEM_11 Amount of work was appropriate and reasonable | .283 | .251 | .601 | .275 | .261 |
| ITEM_10 Student received useful and timely feedback | .302 | .355 | .507 | .269 | .240 |
| ITEM_15 Instructor was caring and respectful of students | .239 | .257 | .312 | .798 | .108 |
| ITEM_14 Instructor was sensitive to students' varying backgrounds | .278 | .237 | .346 | .753 | .143 |
| ITEM_8 Text or readings contributed to my understanding | .289 | .183 | .173 | .096 | .838 |
| ITEM_9 Other assignments (papers, projects, homework) also contributed | .344 | .278 | .284 | .165 | .680 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. *a*. Rotation converged in 8 iterations. | | | | | |

   At this point, the issue facing those responsible for developing faculty development workshops for which of these five factors do they develop a faculty workshop? The answer lies in the evaluation scores given by students to each of the five factors. A simple averaging of the evaluation scores in Table 3 for each item in each factor is presented in Table 5, below. Students are clear. Faculty most need to make their courses stimulating, interesting and thought provoking. Following that are issues involving the selection and use of texts, readings and other assignments.

| Table 5: Averaged Scores for Items in Each Factor | | |
|---|---|---|
| Factor 1 | Communication Skills | 3.33 |
| Factor 5 | Selection of Texts and Assignments | 3.63 |
| Factor 3 | Evaluation of Students | 3.90 |
| Factor 2 | Course Organization | 4.01 |
| Factor 4 | Instructor Personality | 4.02 |

Of course, the preceding is based on the actual items contained on an actual course evaluation form. Ask different questions and a different analysis will result.

## CONCLUSION

Information obtained from course evaluations is almost universally used for personnel decisions: who to hire, promote, tenure and reward with a pay raise. The information ought to be used, as well or instead, to help faculty improve their course evaluation scores. If the objective is to improve student satisfaction as measured by course evaluation instruments, then department chairs, program directors, deans, and those responsible for faculty development would be wise to skip "hot button issues" like digital copyright, as important as they may be, and focus, instead, on what students are telling them in their end-of-term courses evaluations. Since the data are collected, they ought to be used for formative purposes as well as for summative purposes. They should be used, that is, to improve student satisfaction. The faculty member benefits, the program benefits, and the college or university benefits.

In the present example, students are saying that faculty should focus on fundamentals, with communication skills on top. It might be desirable, before proceeding, to further investigate, by way of focus groups with students, what it is about classroom communication skills that is lacking and what it is about the texts, the readings, and the assignments they find disagreeable. But at least then the focus group with students will be targeted and not simply a fishing exhibition.

This much having been accomplished, the next step is clearly to provide faculty with the opportunity to attend a targeted faculty development workshop or series of workshops and then monitor future student course evaluations to determine if the workshops have the desired impact and outcome. What little there is in the literature suggests, as indicated above, that those faculty that receive help make more progress than those that go it alone. A particularly interesting case is that reported by Williams and Cici (1997).

Ceci, a seasoned and respected psychologist, was invited by his university's faculty development program to participate in a teaching effectiveness workshop. He used this opportunity to conduct a naturalistic experiment to "test" whether or not oral presentation skills, alone, can make a difference. He taught a class in the fall, participated in the workshop conducted by a media consultant over the winter break, and then taught the same class the following spring. He used the same syllabus, presented the same lectures (he had independent observers watch video taped sessions from the two semesters and confirmed they presented the same content), had the same schedule, at the same time, used the same book, and gave the same assignments and the same exams. All that changed from the fall semester to the spring semester was the manner in which he presented the material in class: greater pitch variability in his voice, more hand gestures, etc. His course evaluation scores improved on every aspect of the student

evaluation form, including items such as instructor's knowledge, organization, accessibility, the quality of the textbook, and fairness in grading.

## ENDNOTES

[1]    Instructional effectiveness is about more then just measuring student satisfaction.  As Merritt states, "At a very minimum thoughtful evaluation of teaching requires time and attention" and "takes more time than traditional student evaluations" (2007, p. 281, 283).   McLaughlin and Bates (2004) discuss an approach for obtaining reflective and deliberative input from students via the Delphi method and Merritt (2007, pp. 281-286) describes a Small-Group Instructional Diagnosis scheme.

[2]    Research into and debate about the validity, reliability, and utility of student course evaluations blossomed soon after the practice of using them for administrative decisions began.  The literature on the adequacies and inadequacies of student course evaluations is now voluminous.  Extensive reviews can be found in each of the following:  Deborah J. Merritt (2007), "Bias, the Brain, and Student Evaluations of Teaching," *St. John's Law Review* 82: 235-287, provides an informative discussion of much of it, as well as extensive references.  Dennis E. Clayson and Mary Jane Sheffet (2006), "Personality and the Student Evaluation of Teaching," *Journal of Marketing Education* 28 (2): 149-160 covers much of the same territory and also offers extensive references.  Additional discussion and references can be found in Philip C. Abrami, Les Leventhal and Raymond P. Perry (1982), "Educational Seduction," *Review of Educational Research* 52 (3): 446-464; Peter Seldin (1993), "The Use and Abuse of Student Ratings of Professors," *The Chronicle of Higher Education* Vol 39, Issue 46, 21 July, p. A-40; Mary Gray and Barbara R. Bergmann (2003), "Student Teaching Evaluations: Inaccurate, Demeaning, Misused," Academe Online September October, http://www.aaup.org/AAUP/pubsres/academe/2003/SO/Feat/gray.htm; Charles R. Emery, Tracy R. Kramer and Robert G. Tian (2003), "Return to Academic Standards: A Critique of Student Evaluations of Teaching Effectiveness," *Quality Assurance in Education* 11 (1): 37-46; Nitza Davidovitch and Dan Soen (2006), "Using Students' Assessments to Improve Instructors' Quality of Teaching," *Journal of Further and Higher Education* 30 (4): 351-376; and Robin Wilson (1998), "New Research Casts Doubt on Value of Student Evaluations of Professors," *The Chronicle of Higher Education* 44 (19): A12-A14.

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# IMPACT OF BEHAVIORAL FACTORS ON GPA FOR GIFTED AND TALENTED STUDENTS

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## ABSTRACT

*This research explores various behavioral factors and their relationship to success for academically talented students at an upper-level residential school located in the south-central US. Students in their junior and senior years were given the DISC (Dominance, Influence, Steadiness, Conscientiousness) behavioral instrument and tracked over a two year period to identify behavioral factors leading to higher grade point averages. Data were collected from 211 students, including academic and personal demographic information along with DISC scores.*

*Success in this study was measured as the outgoing grade point average (GPA) of the student. Students were partitioned into three groups according to their GPA ranking (independent variable). Eight areas of behavior (dependent variables) were compared across the three GPA groupings. ANOVA was used to assess for differences in the mean values of the dependent variables. Results indicate that three behavioral factors - Analysis of Data, Organized Workplace and Frequent Change – had significantly different mean scores between the three GPA groupings. The other five behavioral factors did not have significantly different mean scores. The findings can also be used to help improve retention at the institution and better predict those who may be at most risk of attrition.*

## INTRODUCTION

An upper-level residential school for accelerated learners faces many of the same concerns as employers. The school administration wants to attract and retain students who have both the behavioral, social and academic skills needed to be successful in the residential school environment (Brody & Benbow, 1986; Caplan, Henderson, Henderson & Fleming, 2002; Lupkowski, Whitmore & Ramsey, 1992; Muratori, Colangelo & Assouline, 2003; and Noble & Drummond, 1992). As in industry, when the fit between student behavioral, social and academic skills is strong, the students potentially have a greater likelihood of persisting and being more

successful while the cost to the school in lost funding opportunities for other potentially successful students decreases.

The purpose of this study is to identify and prioritize behavioral factors that would contribute to student success. Success in this study was measured as the outgoing grade point average (endGPA) of the student.

Identification of the behavioral factors leading to success could assist the school administration in screening students for admission and providing an early warning of students most likely to be at-risk for dropping out. Retention is a significant component of state funding. Furthermore, it would reduce the emotional stress of both students and parents created by the student's dropping out of school before graduating. As reflected in the following section, the identification, selection and effective placement of gifted and talented students has been a topic of research interest for a number of years.

## THEORETICAL BACKGROUND

Identifying and selecting gifted and talented students has been researched for over 40 years (Johns Hopkins University, 1999). Joseph S. Renzulli, Director, The National Research Center on the Gifted and Talented, University of Connecticut, has indicated that highly productive people have three interlocking clusters of ability that can be applied to gifted and talented students: above average ability, task commitment, and creativity (Renzulli, 1986). Sternberg and Wagner (1982) have described giftedness as a kind of mental self management with three characteristics: adapting to environments, selecting new environments, and shaping environments. They also describe three skills typically used: separating relevant from irrelevant information, combining isolated pieces of information into a unified whole, and relating newly acquired information to information acquired in the past. Each of these studies found that gifted and talented students tended to be different in predictable ways.

When gifted and talented students were compared with students of the same age group, personality and behavioral differences were found (Mills, 1993). In this case the Myers-Briggs Type Indicator dimensions were used as a basis for comparison. The gifted and talented students showed greater preferences for introversion, intuition, and thinking. They were also likely to value objectivity and to be impersonal in drawing conclusions. They were more likely to want solutions to make sense in terms of the facts, models, and/or principles under consideration.

The Myers and Briggs Foundation, from the perspective of the student or employee completing the Type Indicator, partially defines introversion as:

> *I like getting my energy from dealing with the ideas, pictures, memories, and reactions that are inside my head, in my inner world. I often prefer doing things alone or with one or two people I feel comfortable with. I take time to reflect so that I have a clear idea of what I'll be doing when I decide to act. Ideas are almost solid things for me. Sometimes I like the idea of something better than the real thing.* (The Myers & Briggs Foundation, 1997d).

Students who score higher on introversion as defined by the Myers-Briggs Type Indicator are likely to use self descriptors such as the following (The Myers & Briggs Foundation, 1997d):

*\* I am seen as "reflective" or "reserved."*
*\* I feel comfortable being alone and like things I can do on my own.*
*\* I prefer to know just a few people well.*
*\* I sometimes spend too much time reflecting and don't move into action quickly enough.*
*\* I sometimes forget to check with the outside world to see if my ideas really fit the experience.*

In solving problems, introverted individuals tend to take time to think and clarify ideas before voicing an answer (Huitt, 1992). They may have fewer friends but those friendships are likely to be close and strong.

Gifted and talented students are also likely to play with ideas and be more intuitive (John Hopkins University, 1998). The Myers and Briggs Foundation partially defines intuition as:

*Paying the most attention to impressions or the meaning and patterns of the information I get. I would rather learn by thinking a problem through than by hands-on experience.* (The Myers & Briggs Foundation, 1997a).

Students who score highly on the Myers-Briggs Type Indicator scale for Intuition typically see statements such as the following generally applying to themselves.

*\* I remember events as snapshots of what actually happened.*
*\* I solve problems by working through facts until I understand the problem.*
*\* I am pragmatic and look to the "bottom line."*
*\* I start with facts and then form a big picture.*
*\* I trust experience first and trust words and symbols less.*
*\* Sometimes I pay so much attention to facts, either present or past, that I miss new possibilities.*
(The Myers & Briggs Foundation, 1997a).

Intuition-oriented people outnumber sensing-oriented (i.e., focusing on information that comes through your five senses) people in academic institutions. This is especially true for post-graduate education (Geyer, 2009).

Gifted and talented students are also likely to score highly on the thinking scale of the Myers-Briggs Type Indicator. The Myers and Briggs Foundation partially defines thinking as:

*When I make a decision, I like to find the basic truth or principle to be applied, regardless of the specific situation involved. I like to analyze pros and cons, and then be consistent and logical in deciding. I try to be impersonal, so I won't let my personal wishes--or other people's wishes--influence me.* (The Myers & Briggs Foundation, 1997b)

Students who score highly on the Myers-Briggs scale for thinking typically see statements such as the following generally applying to themselves:

*\* I enjoy technical and scientific fields where logic is important.*
*\* I notice inconsistencies.*
*\* I look for logical explanations or solutions to most everything.*
*\* I make decisions with my head and want to be fair.*
*\* I believe telling the truth is more important than being tactful.*
*\* Sometimes I miss or don't value the "people" part of a situation.*
*\* I can be seen as too task-oriented, uncaring, or indifferent.*(The Myers & Briggs Foundation, 1997b)

Huitt argues that individuals with a thinking preference will use logic and analysis more than values and feelings during problem solving. (Huitt, 1992). These students gave emphasis to thinking over feeling. They tended to score higher on achievement drive and lower on interpersonal and social concerns.

Additionally, the academically talented students expressed a preference for a perceptive style. The Myers & Briggs Foundations defines perceiving as:

*To others, I seem to prefer a flexible and spontaneous way of life, and I like to understand and adapt to the world rather than organize it. Others see me staying open to new experiences and information.* (The Myers & Briggs Foundation, 1997c)

Students who score highly on the Myers-Briggs Type Indicator scale for perceiving typically see statements such as the following generally applying to themselves:

*\* I like to stay open to respond to whatever happens.*
*\* I appear to be loose and casual. I like to keep plans to a minimum.*
*\* I like to approach work as play or mix work and play.*
*\* I work in bursts of energy.*
*\* I am stimulated by an approaching deadline.*
*\* Sometimes I stay open to new information so long I miss making decisions when they are needed.* (The Myers & Briggs Foundation, 1997c)

In type language perceiving is reflecting a preference for a way to take in information. The gifted and talented students gave emphasis to perceiving over judgment (i.e., a stronger preference for a less structured and more flexible lifestyle and less preference for a more structured and decided lifestyle).

Other researchers have also identified characteristics typical among gifted and talented students. One such researcher is Susan Johnsen (2003) who completed a comprehensive review of research related to describing characteristics of gifted students. A number of the

characteristics identified in Johnsen's work show similarities to constructs described by The Myers and Briggs Foundation, including the following:

* *Attracted toward cognitive complexity, enjoys solving complex problems*
* *Analyzes problems and considers alternatives*
* *Understands abstract ideas and concepts*
* *Solves problems intuitively using insight*
* *Organizes data and experiments to discover patterns or relationships*
* *Likes independent study and research in areas of interest*
* *Is observant and pays attention to detail*
* *Is persistent and task committed in area of interest*
* *Is well-organized*
* *Maintains on-task focus*
* *Has a cooperative attitude; works well in groups*
* *Participates in most social activities, enjoys being around other people*
* *Influences the behavior of others; recognized as a leader by peers*
* *Problem-centeredness or persistence in problem solving*
* *A large storehouse of information*
* *Logical approaches to solutions*

Renzulli & Park (2007) have suggested that schools must identify and pay attention to signs of frustration and discontent in gifted students. They also suggested that schools should change school culture to provide challenging curriculums to accommodate the student's learning needs and interests. Earlier Silverman (2004) recommended that schools should provide learning communities by factoring into the classroom various kinds of students. Renzulli and Park (2007) cautioned schools to "find ways to affirm students who don't fit the 'good student' mold." (p. 40).

The literature related to student effectiveness shows both similarities and differences. Four behavior style-based factors frequently identified as being closely related to effective work skills are D or Dominance, I or Influencing, S or Steadiness or Supportiveness, and C or Compliance or Conscientiousness (Bonnstetter & Suiter, 2007; Straw, 2002; Wittmann, 2008; Zigarmi, Blanchard, O'Conner & Edeburn, 2004). Four other somewhat similar style-based factors related to effective communication and relationships use terminology such as Driver or Director, Expressive or Socializer, Amiable or Relater and Analytical or Cautious (Alessandra, O'Connor & Alessandra, 1990; Bolton & Bolton, 1996; Merrill & Reid, 1981).

Style Insights – DISC is produced by Target Training International (TTI) – Performance Systems, Ltd. TTI uses the term 'style' as originally suggested by Fritz Perls to relate more to the specifics of how someone does something (Watson & Klassen, 2004, p. 4). The Style Insights - DISC (Dominance, Influencing, Steadiness, Compliance) behavioral instrument produced by TTI has made changes to newer versions of their instrument as a means of keeping pace with current terms and descriptors being used (Watson & Klassen, 2004). The DISC theory was originally developed by Marston (1928) and published in The Emotions of Normal People. Using DISC

terminology Marston described people as behaving along two axes, passive or active, depending on the individual's perception of the environment as either antagonistic or favorable (Bonnstetter & Suiter, 2007). These can be grouped into four quadrants as follows:

*\* Dominance (D) generates activity in an antagonistic environment;*
*\* Inducement (I), later changed to Influencing, generates activity in a favorable environment;*
*\* Steadiness (S) generates passivity in a favorable environment; or*
*\* Compliance (C) generates passivity in an antagonistic environment (Bonnstetter & Suiter, 2007).*

Vrba (2008) defines each of the DISC factors as follows:

*\*Dominance. Dominance style of behavior is direct and decisive. This individual feels that it is important to achieve goals, they do not need to be told what to do, and they set high standards. When projects take too long they grow impatient: they enjoy competition and want to win. They are sometimes blunt and come to the point directly. "D" individuals tend to be direct, controlling, risk-taking, pessimistic, judging, extroverted, change-oriented, and fight-oriented.*
*\*Influencing. The Influencing behavior style reflects outgoing, optimistic individuals who love to communicate, and are people persons. These individuals tend to participate in team and group activities; they like the limelight though may not want to lead. "I" individuals prefer to be direct, accepting, risk-taking, optimistic, perceiving, extroverted, change-oriented and flight-oriented.*
*\*Steadiness. The Steadiness behavior style shows sympathetic, cooperative behavior. Helping others and fitting in are important to these individuals though they are hesitant to implement change and do not like to be in the limelight. "S" individuals tend to be indirect, accepting, risk-assessing, optimistic, perceiving, introverted, continuity-oriented, and flight-oriented.*
*\*Compliance. Compliance behavior style tends to be reliable and trustworthy. These individuals will plan out a strategy considering all the facts and possible malfunctions, and they prefer to work alone. "C" individuals prefer to be indirect, controlling, risk-assessing, pessimistic, judging, introverted, continuity-oriented, and fight-oriented.*

Marston did not develop the DISC instrument, but his work did lay the foundation for the current DISC behavioral instrument (Bonnstetter & Suiter, 2007). Walter Clarke developed the first DISC related instrument entitled Activity Vector Analysis (Personality Insights, 1940). The Style Insights – DISC instrument used in this study was developed and validated by Bonnstetter (2006) and Target Training International, Ltd. Over 20 years of research and validation studies have been completed. The most recent validation study was conducted by Klassen (2006).

Use of the DISC model provides a behavioral framework to help people understand their behavior preferences, learn to identify behavior preferences of others, and learn to identify specific behaviors best suited for various organizational environments (Warburton, 1983). This behavioral instrument also measures behavior preferences for natural (i.e., least like me) and adaptive (i.e., most like me) (Watson & Klassen, 2004).

According to Warburton (1983, p. 2), "this is the information which they require for maximum productivity and to build multiform, harmonious relations with others." Working with a model such as that provided by the DISC approach helps overcome the belief that only people

who are like me are the best choice for work positions or team members for a school project (Hymowitz, 2004; May & Gueldenzoph, 2003). Of particular interest for this study is the measure of behavioral hierarchy factors. These factors have been shown to relate to the ability to call upon many or fewer behavioral skills (Bonnstetter, 2006).

## BEHAVIORAL FACTORS

The Style Insights – DISC identifies behavioral factors in which a person will naturally be most effective. Additionally, the Style Insights – DISC classifies the relative strength of the eight behavioral factors. These factors are each scored on a 0-10 scale.

| Table 1: Behavioral Factors and Definitions | | |
|---|---|---|
| Item Number | *Behavioral Factor* | *Definition* |
| Item 1 | **Analysis of Data** | Analyzing and challenging details, data and facts prior to decision making and is viewed as an important part of decision making. Information is maintained accurately for repeated examination as required. |
| Item 2 | **Competitiveness** | Tenacity, boldness, assertiveness and a "will to win" in all situations. |
| Item 3 | **Customer-Oriented** | Maintaining a positive and constructive view of working with others. Spending a high percentage of time listening to, understanding and successfully working with a wide range of people from diverse backgrounds to achieve "win-win" outcomes. |
| Item 4 | **Frequent Change** | "Juggling many balls in the air at the same time." Moving easily from task to task or being asked to leave several tasks unfinished and easily move on to the new task with little or no notice. |
| Item 5 | **Frequent Interaction with Others** | A strong people orientation, versus a task orientation. Dealing with multiple interruptions on a continual basis, always maintaining a friendly interface with others. |
| Item 6 | **Organized Work Place** | Systems and procedures followed for success. Careful organization of activities, tasks and projects that require accuracy. Record keeping and planning for success. |
| Item 7 | **Urgency** | Decisiveness, quick responses and fast action. Critical situations demanding on-the-spot decisions made in good judgment. Important deadlines met. |
| Item 8 | **Versatility** | Carrying a high level of optimism and a "can do" orientation. Bringing together a multitude of talents and a willingness to adapt the talents to changing assignments as required. |
| Source: Target Training International, Anne Klink (personal communication, November 24, 2009) | | |

## METHODOLOGY& HYPOTHESES

A two-year, accelerated public residential state high school for students in their junior and senior years was utilized in this study. The school is located in the south-central US; studies at the institution focus primarily on mathematics, science, computer science and humanities. It is part of that state's flagship university system. Admission to the school is competitive and

selective; previous GPA at the student's home high school is used as a criterion, along with ACT or SAT scores.

Despite the best efforts of the institution, students in the program sometimes drop out. Other than academic criteria, there are no additional predictors of success. There is significant investment of time and money in selecting high school juniors and seniors to attend an accelerated residency school for gifted and talented students. Furthermore, students who drop out cannot be replaced, which can impact school funding.

This research explores various predictors of success at an accelerated residential gifted and talented upper-level high school for math and science. Students in their junior and senior years were given the DISC (Dominance, Influence, Steadiness, Conscientiousness) behavioral instrument and tracked over a two year period to identify predictor attributes of success. Data were collected from 211 students, including academic and personal demographic information along with DISC scores. All data collection was completed in a computer lab with online testing; results were provided to the students approximately two months following their participation.

Student cumulative GPAs were rank-ordered from highest to lowest. The sample was then split into three groups of equal size: High GPA, Medium GPA and Low GPA. A categorical value of 1 (High), 2 (Medium) and 3 (Low) was assigned to each student depending on their GPA level. This categorical value was used to compare mean scores for the eight behavioral traits by means of ANOVA.

Based on the literature reviewed above, the following hypothesized significant differences (or lack thereof) and directionality were tested:

| Table 2: Hypotheses Matrix of Mean Score Differences | | |
|---|---|---|
| Behavioral Trait | Hypothesized Difference | Directionality(*) |
| H1. Analysis of Data | Yes | + |
| H2. Competitiveness | Yes | + |
| H3. Customer-Oriented | No | n/a |
| H4. Frequent Change | Yes | - |
| H5. Frequent Interaction with Others | Yes | - |
| H6: Organized Work Place | Yes | + |
| H7. Urgency | Yes | + |
| H8. Versatility | No | n/a |
| (*) + indicates higher value for high GPA group; - indicates lower value for high GPA group; n/a indicates directionality not considered for no-difference hypotheses. | | |

We thus hypothesized that the highest GPA students would be superior in analytical skills, competitiveness, desire for an organized workplace, and sense of urgency; conversely, we hypothesized the highest GPA earners would desire less frequent change and less interaction

with others. Finally, we hypothesized no significant differences between the groups on customer orientation and versatility.

## RESULTS AND DISCUSSION

Mean scores for each of the eight behavioral dimensions were calculated for the three GPA groups, and appear in Table 3 below. The individual scores for these eight dimensions were then entered into an ANOVA to test for significant differences in the means among the three GPA groups. These results appear in table 4 below.

| Table 3: Mean Scores of 8 Behavior Traits by GPA Group | | | |
|---|---|---|---|
| | High GPA Mean | Medium GPA Mean | Low GPA Mean |
| ITEM1 | 6.147 | 5.878 | 5.684 |
| ITEM2 | 5.787 | 5.959 | 6.132 |
| ITEM3 | 6.408 | 6.574 | 6.529 |
| ITEM4 | 5.201 | 5.362 | 5.582 |
| ITEM5 | 5.445 | 5.649 | 5.824 |
| ITEM6 | 5.789 | 5.432 | 5.338 |
| ITEM7 | 5.024 | 4.993 | 5.338 |
| ITEM8 | 5.026 | 5.041 | 5.390 |

Of the eight items, there were significant differences reported (at $p <= 0.05$) on Items 1 (Analysis of Data), 4 (Frequent Change) and 6 (Organized Work Place), and in the direction hypothesized. Traits #3 and #8 were hypothesized to have no significant difference between the means of the three groups, and the findings supported these hypotheses. We thus retain H1, H3, H4, H6 and H8, while rejecting the remainder.

Given the nature of the program at this particular institution, the results are not surprising. The heavy curricular emphasis on math and science is one that demands the ability to work with and understand data analysis and abstract concepts. Furthermore, a stable (seldom changing) and organized work environment is conducive to this type of scholarly pursuit and will likely reinforce the student's tendencies toward being a data analyst.

That Competitiveness did not produce a significant difference between the three GPA groups is perplexing in that the academic environment in which these students live and function is quite competitive. We would have thus expected these students to be more competitive at higher GPA levels. Ironically, the highest GPA group demonstrated the lowest level of Competitiveness (contrary to the hypothesized direction).

| Table 4: ANOVA (Mean Scores of 8 Behavior Traits by GPA Group) | | | | | | |
|---|---|---|---|---|---|---|
| | | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
| ITEM1 | Between Groups | 58.153 | 2 | 29.077 | 3.665 | .027 |
| | Within Groups | 1650.292 | 208 | 7.934 | | |
| | Total | 1708.445 | 210 | | | |
| ITEM2 | Between Groups | 29.411 | 2 | 14.706 | 2.007 | .137 |
| | Within Groups | 1523.992 | 208 | 7.327 | | |
| | Total | 1553.403 | 210 | | | |
| ITEM3 | Between Groups | 9.231 | 2 | 4.615 | 1.461 | .234 |
| | Within Groups | 657.217 | 208 | 3.160 | | |
| | Total | 666.448 | 210 | | | |
| ITEM4 | Between Groups | 32.595 | 2 | 16.297 | 3.203 | .043 |
| | Within Groups | 1058.465 | 208 | 5.089 | | |
| | Total | 1091.060 | 210 | | | |
| ITEM5 | Between Groups | 36.825 | 2 | 18.413 | 2.117 | .123 |
| | Within Groups | 1809.298 | 208 | 8.699 | | |
| | Total | 1846.123 | 210 | | | |
| ITEM6 | Between Groups | 70.410 | 2 | 35.205 | 3.525 | .031 |
| | Within Groups | 2077.455 | 208 | 9.988 | | |
| | Total | 2147.865 | 210 | | | |
| ITEM7 | Between Groups | 12.103 | 2 | 6.051 | .903 | .407 |
| | Within Groups | 1394.279 | 208 | 6.703 | | |
| | Total | 1406.382 | 210 | | | |
| ITEM8 | Between Groups | 18.653 | 2 | 9.327 | 1.627 | .199 |
| | Within Groups | 1192.453 | 208 | 5.733 | | |
| | Total | 1211.107 | 210 | | | |

The Customer-Oriented behavior was also not significantly different between the group means, as hypothesized. Mean scores across all three groups for this variable were the highest of the eight, indicating a strong effort exists among the students in general to find win-win outcomes.

Frequent Interaction With Others was a more recognized trait as GPA level dropped, but there was no significant difference in the mean scores between the groups. The directionality, though, was the same as hypothesized, suggesting that those with the highest GPAs are more likely to want to spend more time alone, presumably studying.

Urgency was hypothesized to be significantly greater for the higher GPA students, but the results did not show this to exist. This outcome is possibly explained in that the sample is already

an academically elite group, and may all thus demonstrate what could be considered at least moderate levels of urgency.

Versatility was hypothesized to not be significantly different across the groups, and the results showed this to be true for this sample. The student body of this institution may very well be characterized as being high achievers, which the "can do" orientation of this variable captures.

This study is limited in that it was conducted at only one institution at one point in time, and thus should be replicated across time and across institutions. Furthermore, it was conducted only with individuals who are already in a very elite group of academically advanced teenagers. Thus, the ability to predict outcomes across ages and academic levels of success may be limited.

Still, the identification of these three traits is helpful in understanding the drivers of success (as measured by GPA) in this type of environment. Furthermore, this information can be very helpful for institutions of this sort in maintaining high retention rates as well as identifying those students who might be at elevated risk of not being successful (or withdrawing).

Finally, the application of the DISC in an academic setting such as this is novel in that it has heretofore been used primarily in the workplace. Being able to identify traits related to success can thus be useful in a wide variety of ages, and may help identify students most likely to not only succeed in academics, but also in the workplace.

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# PREDICTING AND MONITORING STUDENT PERFORMANCE IN THE INTRODUCTORY MANAGEMENT SCIENCE COURSE

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## ABSTRACT

*This study examines the factors that influences students' grade and could predict their performance in the Introductory Management Science course. Previous research works have identified factors that influence performance of undergraduate students in the Introductory Management Science - a core course requirement for many business degree programs. This paper follows up the authors' previous work on a multivariate model that related performance to a diverse range of factors (D'Souza & Maheshwari, 2009). A multiple linear regression model was developed and tested at appropriate level of significance. This research extends application of the regression model to predict performance of incoming students and to monitor their performance during the course of the semester. The independent variables included in the model were: current grade point average, average homework score, course utilization ratio, and completion of pre-calculus prerequisite. The regression model is used to create a Grade Prediction Table. A unique feature is use of the Grade Prediction Table to determine conditional probabilities of a student earning a final letter grade at the end of the semester after knowing her/his predicted letter grade at the beginning of the semester. The incoming students at a predicted risk of failure can be identified and appropriate guidelines are suggested to improve their performance. By taking early action, it is estimated that the number of failing students (27%) could be reduced by around 20%, while 22% of non-failing students could improve their predicted grades.*

## INTRODUCTION

There is a growing concern about poor performance of undergraduate students in the introductory management science course, which is a core requirement in many business degree programs and a prerequisite for advanced courses. Various studies have been conducted to determine the factors influencing the performance. These studies have identified the possible causes of poor academic performance in introductory courses across several disciplines but do not necessarily agree on the reasons for poor performance. It appears that each institute needs its

own model to reflect their course design and teaching methodology. Statistical techniques have produced models for evaluating the performance of students but have fallen short in predicting and monitoring the performance. An extended study is necessary to understand the predictability characteristic of these models for monitoring performance during the semester.

This is a continuation of a two-part study conducted on the Quantitative Methods course over a three-year period covering sections taught during the fall 2005 to fall 2007 semesters. In order to protect the confidentiality of student, personal identities were not disclosed and the study was approved by the University's Institutional Review Board (IRB).

The first part of the study conducted during fall 2005 to spring 2007 semesters by D'Souza and Maheshwari (2009) developed a multiple regression model that included four independent variables as a predictor of student performance. The independent variables included in the model were: current grade point average, average homework score, course utilization ratio, and completion of pre-calculus prerequisite. The model explained 51% of the variations in performance. In this follow up study, the previously developed multiple regression model is utilized to develop an approach to predict performance of students enrolling in this course. A comparison of the predicted performance with the actual performance shows that the model provides a good fit with an average error (residual) of +0.51. The predicted performance was further validated on a new batch of students during the following fall 2007 semester resulting in an average error (residual) of +1.64, suggesting that the model could predict performance fairly accurately.

The letter grades corresponding to the predicted performance and actual performance were classified into four groups and analyzed using a cross-classification table (contingency table). A Grade Prediction Table is presented that could be used to monitor the performance of incoming students at the start of classes. The Table provides conditional probabilities of a student earning a final grade at the end of the semester after knowing her/his predicted grade at the beginning of the semester. A guideline is provided for instructors to monitor student performance during the semester. Students at a high risk of failure could be advised early on during the semester and appropriate actions suggested to improve performance. It is our estimate that the number of failing students (27%) could be reduced by around 20% while 22% non-failing could improve their predicted grades by early action.

The current study appears to be unique in that it extends the application of the multivariate model to predict and to monitor performance, while most studies reported in the literature have identified factors that influence the performance. In the following sections, we review past research on performance evaluation across various disciplines. Next, we present the analysis of performance data and results. Finally, we discuss the results along with limitations of the study, and recommendations for future research.

# LITERATURE REVIEW

The relationship between the student performance and possible explanatory factors using multivariate analysis has been documented by researchers from different disciplines. Brookshire and Palocsay (2005) applied multiple regression analysis to determine significant factors that impact performance of students in an undergraduate management science course and found overall academic performance (GPA) had the strongest correlation with performance, while other variables included in the model: SAT math score, prerequisites (calculus and statistics), major, and instructor had a lesser significance on the performance. Kruck and Lending (2003) developed a multiple regression model that used five independent variables to predict grades in an introductory information science course. D'Souza and Maheshwari (2009) studied the performance of approximately 300 students in an introductory management course. Controlling for instructor and institution, it was found that four variables, GPA, home work grade, pre-calculus and course utilization ratio, directly relate to the performance of the students in the management science course.

Eikner and Montondon (2001) identified eight independent variables as potential performance indicators in the first intermediate accounting course and found three to be significant: college GPA, grade in the first accounting principle course, and age. Garcia and Jenkins (2003) used multiple regression and principal component analysis to study the impact of around 20 independent variables on performance of a degree program in accounting and finance and found six were significant in explaining the variation in current performance. A multiple regression model was developed by Al-Rashed (2001) that related the final GPA of accounting students to 11 independent variables. After conducting a stepwise multiple regression analysis, Al-Rashed (2001) found a single variable (GPA) most significant, while the others had lesser degree of significance in predicting performance. Stepwise multiple regression analysis was applied by Ohring (1972) to identify the few independent variables (predictors) that mostly explains the variance of the dependent variable.

Predicting academic performance at the undergraduate and graduate levels has been attempted earlier by researchers. Butcher and Muth (1985) indicated the possibility of predicting performance ($R^2 = 0.366$) in an introductory computer science course based on high school GPA and standardized (ACT) scores. The success in the first year computer science major was predicted on the basis of students' entry level characteristics and continuation in this or other science majors (Campbell and McCabe, 1984). Yousuf and Mohammad (1988) evaluated the admission standards applied by Kuwait University in predicting academic performance and made recommendations on incoming students admission requirements.

Recent studies have utilized multivariate analyses to predict academic performance at the undergraduate and graduate programs. Golding and McNamarah (2005) utilized stepwise regression to predict academic performance of students on the basis of students' demographics, entry qualifications and test scores, and performance in first year courses. Although this model

had a low explanatory power, it was suggested for use as admission indicators to the School of Computing and Information Technology. Nghe et. al. (2007) have compared the accuracy of Decision Trees and Bayesian Network algorithms in predicting academic performance of undergraduate and graduate students at two Asian institutes. These predictions can be used in admission, scholarship determination, and/or identification of poor performing students. Fish and Wilson (2007) have investigated relevant factors to predict performance of one-year MBA students that could assist in the admission process. Braunstein (2002) applied correlation and regression analysis to identify variables related to academic performance in the MBA program, noting that 24% of the performance variation was explained by GMAT score, undergraduate GPA, and number of years of work experience. The Graduate Management Admission Council (2007 determined that the GMAT scores were better predictor of doctoral student performance than undergraduate GPA. Naik and Ragothaman (2004) demonstrated that a neural network model performs equally well as statistical models in predicting performance of MBA students.

The review of previous research across various fields identified a range of factors that could predict the academic performance in introductory courses. Most of the studies have developed models that perform a post analysis of performance. To the best of our knowledge, no study has applied these models to predict the letter grades of incoming students and monitor performance during the semester.

## PERFORMANCE DATA ANALYSIS AND RESULTS

The course studied for this research was a three credit hour introductory management science (Quantitative Methods) course required by all business majors and used as an elective by students from other majors. This sophomore level course is sequenced during the fourth semester and requires pre-calculus and statistics prerequisites. The classes were taught by a single tenured faculty on Monday, Wednesday, and Friday between 8:00 AM and 11:00 AM. A common course syllabus and grading scale was used covering deterministic and probabilistic models outlined in the sample course design by Borsting, et. al. (1988). Powerpoint presentation was used as a teaching tool in all sections and made available electronically to students. The final score was complied as a weighted sum of three tests (45%), final examination (20%), homework (10%), quizzes (10%), class project (10%), and attendance/participation (5%). A course letter grade was assigned according to the University's grading system. The tests and final examination consisted of a combination of multiple-choice questions (30%) and numerical problems (70%). Homeworks and quizzes were assigned at the end of each chapter and were graded and returned back to students. The class project demonstrated an application of a management science technique covered during the course. The attendance/participation score was computed based on the number of unexcused absences. Students require a C or higher grade to pass the course.

The complete study was carried out in two parts over a three-year period covering sections taught during the fall 2005 to fall 2007 semesters. The first part, conducted by D'Souza and Maheshwari (2009) on a sample of 297 students during fall 2005 to spring 2007 semesters investigated the basic research question: *What factors determine academic performance in an introductory management science course?* A preliminary statistical analysis of 22 possible factors resulted in nine being included as independent variables in a multiple regression model. The final multiple regression model was created using stepwise method (SPSS Inc, 2003) resulting in four independent variables as a predictor for student performance. These four variables that explained 51% of the variations in performance were current grade point average, average homework score, course utilization ratio (ratio of total hours earned by total hours attempted), and completion of precalculus prerequisite. The following multiple regression model developed by D'Souza and Maheshwari (2009) is used as the grade prediction equation (i):

$$AVGT_p = 67.847 + 13.303GPA + 1.213AHW - 40.721HE/HA + 3.666P3. ---------(i)$$

Dependent variable:
$AVGT_p$: the simple average of three tests and final examination scores.

Independent Variables:
GPA: a continuous variable representing the current class GPA up to completion of the Quantitative Methods course.
AHW: a continuous variable representing the average homework score out of 10.
HE/HA: a continuous variable representing course utilization ratio (total hours earned by total hours attempted) up to completion of the Quantitative Methods course.
P3: a dummy variable for Pre-calculus prerequisite. Completed = 1, not completed = 0.

The main objective of this study is to develop an approach to predict and monitor the student performance in this course. The regression model developed in the previous study (D'Souza and Maheshwari, 2009) is utilized to predict student performance in the beginning of the semester.

The grade prediction equation (i) is used to predict the average grade ($AVGT_p$) defined as the simple average of four in-class examinations including final examination, for each student The $AVGT_p$ was then used to provide corresponding predicted letter grades ($LETG_p$). Three of the four predictor variables--GPA, HE/HA, and P1 were obtained from the students' transcripts. The fourth predictor variable, average homework score (AHW), was assigned an average value of 7.5. This was done since average homework grades were not available in the beginning of the semester. The actual performance ($AVGT_a$) and corresponding letter grades ($LETG_a$) were

computed from the average score on the three tests and final examination at the end of the semester.

The predicted performance ($AVGT_p$) computed by the regression model was compared with actual performance ($AVGT_a$) during the fall 2005 to spring 2007 semesters. The scatter plot of average grade (Figure 1) illustrates a very good agreement between predictor ($AVGT_p$) and actual ($AVGT_a$) variables. The scatter plot shows some outliers at the lower $AVGT_a$ indicating that prediction from the model slightly diverges for the poorly performing students. In general, it appears that the model provides a good fit with a low average error (residual) of +0.51 suggesting that the model could accurately predict performance. A paired sample t-test was calculated to compare the mean $AVGT_p$ to the mean $AVGT_a$. The mean and standard deviation were 79.04 and 5.36 for the $AVGT_p$ and; 78.53 and 9.31 for the $AVGT_a$ respectively. No significant difference from $AVGT_p$ to $AVGT_a$ was found (t (297) = 1.279, p > 0.05).

**Figure 1. Scatter Plot of $AVGT_p$ vs $AVGT_a$ (Fall '05 to Spring 2007)**
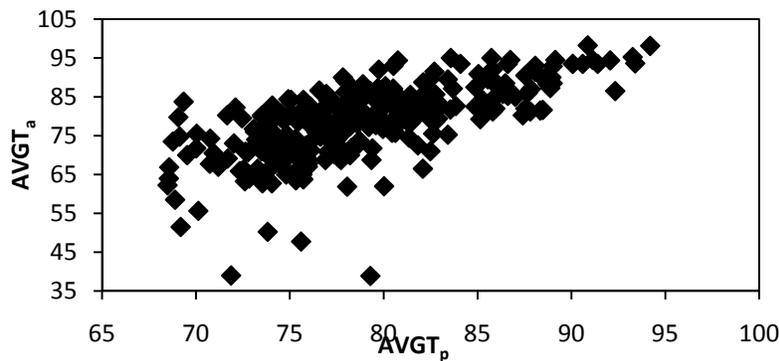


The relationship between the predicted grade ($LETG_p$) and actual grade ($LETG_a$) was analyzed using a cross-classification or a contingency table (Lind et al., 2006). The letter grades were classified into A- to A+, B- to B+, C to C+, and C- and lower. A contingency table was created as shown in Table 1. This contains frequency of observations (counts and percentages) occurring at the various combinations of $LETG_p$ and $LETG_a$.

| Table 1. Letter Grade Contingency Table ($LETG_a$ vs $LETG_p$) | | | | | |
|---|---|---|---|---|---|
| Predicted Grade ($LETG_p$) | Actual Grade ($LETG_a$) | | | | |
| | A- to A+ | B- to B+ | C to C+ | C- and Lower | Total |
| A- to A+ | 9 (90%) | 1 (10%) | 0 (0%) | 0 (0%) | 10 |
| B- to B+ | 25 (21%) | 67 (58%) | 20 (17%) | 5(4%) | 117 |
| C to C+ | 1 (.8%) | 38 (28%) | 42 (31%) | 53 (40%) | 134 |
| C- and Lower | 0 (0%) | 5 (14%) | 8 (22%) | 23 (64%) | 36 |
| Total | 35 | 111 | 70 | 81 | 297 |

This total shows that 141 (48%) students achieved the grade as predicted by the model, while 77 (26%) students earned higher grade and 79 (26%) earned lower grade than predicted. Around 27% (81/297) of the students were predicted to earn a C- and lower grade and thus, fail the course (actual failing rate was 30.5%). However 58 (53 from C to C+ and 5 from B- to B+ group) students, who were predicted to pass the course, failed the course. That is 20% (58/297) of the students who were predicted to earn higher than C could avoid failing the course if appropriate action was taken early. Similarly, 7% (21/297) students, who passed but with lower than predicted grades, could be monitored and be advised for better potential grade. Table 1 also show that 64 students (approximately 22%) of the non-failing students performed better than the predicted grades. Most of these students came from B- to B+ or C to C+ category of predicted grades. These students could be further encouraged to improve their predicted grades.

The Contingency Table (Table 1) is restated to show conditional probability of a student receiving an actual course grade ($LETG_a$) at the end of the semester given the predicted grade ($LETG_p$) at the beginning of the semester. The Grade Prediction Table (Table 2) shows the conditional probabilities of getting a grade based on the predicted grade $P(LETG_a|LETG_p)$.

| Table 2.  Grade Prediction Table | | | | |
|---|---|---|---|---|
| Predicted Grade ($LETG_p$) | Actual Grade ($LETG_a$) | | | |
| | A- to A+ | B- to B+ | C to C+ | C- and Lower |
| A- to A+ | 0.90 | 0.10 | 0.00 | 0.00 |
| B- to B+ | 0.21 | 0.58 | 0.17 | 0.04 |
| C to C+ | 0.008 | 0.28 | 0.31 | 0.53 |
| C- and Lower | 0.00 | 0.14 | 0.22 | 0.64 |

The Grade Prediction Probabilities were validated with different data sample taken from the Fall 2007 semester. The grade prediction equation (i) was applied to predict the excepted performance of incoming students during the start of the semester. The independent variables used were students' GPA, ratio of hours earned to hours attempted (HE/HA), passing grade in the prerequisite class-pre-calculus mathematics (P3), and an estimated value of average homework score of 7.5. The students' performance was monitored during the semester. The predicted performance ($AVGT_p$) was compared with the actual performance ($AVGT_a$) for students who completed the course (n = 56). The scatter plot (Figure 2) of the $AVGT_p$ versus the $AVGT_a$ shows most points fall very close to a possible regression line except for a few outliers at the lower $AVGT_a$ values. It appears that the model provides a good fit with an average error (residual) of +1.64 suggesting that the model could predict performance fairly accurately though slightly optimistic. A paired sample t-test was calculated to compare the mean $AVGT_p$ to the mean $AVGT_a$. The mean of the $AVGT_p$ was 80.7 (sd = 5.82) and the mean of the $AVGT_a$ was 79.07 (sd = 11.15). No significant difference from $AVGT_p$ to $AVGT_a$ was found (t (56) = 1.475, p > 0.05).

The corresponding predicted letter grades (LETG$_p$) were computed at the beginning of the semester and compared with the final letter grades (LETG$_a$) earned at the end of the semester (Figure 3). Around 54% of students maintained the same predicted letter grades, while 9% improved and 37 % lowered their grades. The students in the C to C+ category were more prone to sliding to C- and Lower. The number of students earning a lower grade could have been reduced by early action recommended in the Guidelines for Monitoring Grades (Table 3).

**Figure 2. Scatter Plot of AVGT$_p$ vs AVGT$_a$ (Fall '07)**
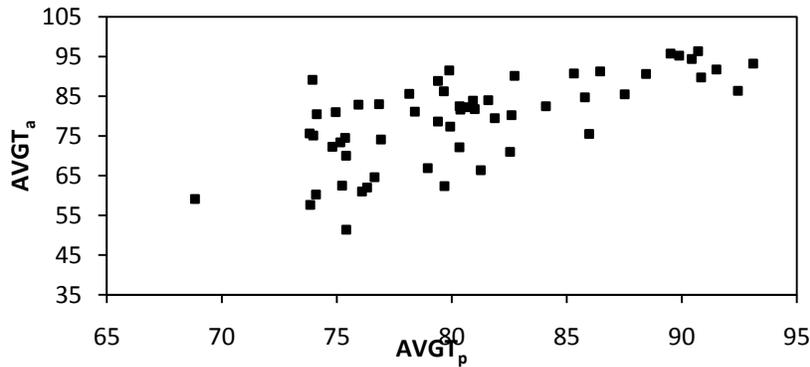


Figure 3. Fall 2007-Predicted Letter Grade (LETG$_p$) vs Actual Letter Grade (LETG$_a$)
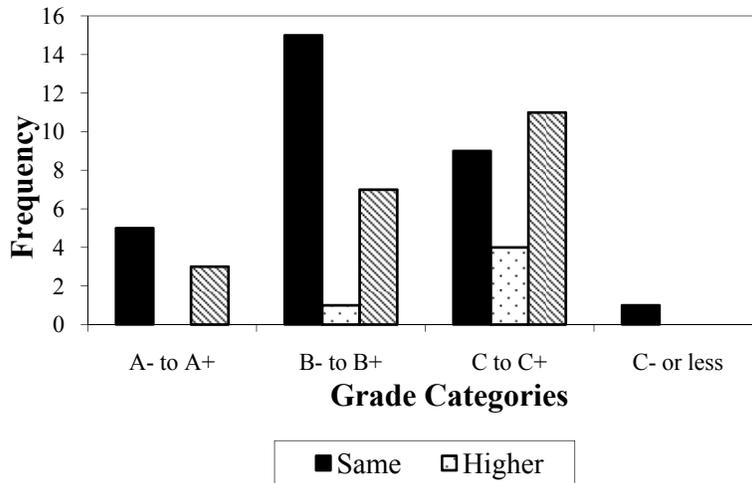


The faculty members may use guidelines presented in Table 3 to monitor student performance during course of the semester. Grades of all incoming students need to be predicted at the beginning of the semester using the grade prediction equation (i).

| Table 3. Guidelines for Monitoring Grades | |
|---|---|
| If LETG$_p$ is Between: | Action Recommended |
| A- to A+ | Student has a very high chance (90%) of maintaining the predicted grade and a low chance (10%) of earning less than predicted grade. It may be due reduced effort or complacency on the part of student. These students are highly motivated and require little or no intervention. |
| B- to B+ | Student has a high chance (79%) of maintaining or improving the predicted grade. Student has some chance (21%) of falling below the predicted grade. Moderate professor guidance will be useful to keep these students motivated and interested in the course. These interventions could include advisement, tutoring, assistance during office hours. |
| C to C+ | Student has a good chance (59.8%) of maintaining or slightly improving the predicted grade. However, there is a good chance (40%) of falling below the predicted value which means failing the course. Well designed intervention plan is needed for these students; this may include extra help sessions, extra explanation on homework, more homework, tutoring, assistance during office hour, advisement for better study habit, etc. A continuous monitoring of these students is highly recommended specially their attendance, homework scores, and test scores. |
| C- and Lower | Student has a high chance (64%) of failing this course that is students are less likely to improve performance or they fall below the predicted grade. However, there is some chance (36%) to improve as well. These students can be advised to take the class with lighter overall load, study harder for the class, or can be helped with well designed intervention plan as described above section (C to C+). These students would be strongly advised to strengthen and to review math pre-requisite skills. |

The actions recommended for different classification of predicted grades maybe reviewed during the course of the semester. Students at a high risk of failure (C- or Lower) need to be advised early on during the semester and after the midterm evaluations. Similar proactive ways aimed at flagging students performing inconsistently have been implemented by elementary school systems (Daily Press, 2008).

## CONCLUSIONS

The objective of this paper is to predict performance of incoming student in the Introductory Management Science (Quantitative Methods) course and monitor the performance during the semester. Faculty teaching the course must do a prior analysis of each student's background at the beginning of the semester. The predicted performance (AVGT$_p$) and corresponding letter grade (LETG$_p$) could be computed by the grade prediction equation (i) and the Grade Prediction Table. Using the Guidelines for Monitoring Grades (Table 3), students could be informed of their chances of maintaining the predicted grade or improving the same. The students in the C to C+ category are more vulnerable to failing the course (C- and Lower)

and hence need close monitoring during the semester. Some of these possible strategies are included in Table 3. Student whose predicted grade fall under C- and lower could be advised to take appropriate action such as strengthening basic math skills, seeking tutorial help, improving study habits and class attendance, etc. Some of these students missing the necessary prerequisites may be advised to drop the course and complete the prerequisites.

During the study period fall 2005 to spring 2007, 30.5% of students actually earned a failing grade. It is estimated that around 20% of these students could have successfully completed the course if appropriate action was taken. In addition, around 22% of the students that earned passing or higher predicted grades could possibly improve their final earned grades. These improvements are possible with early intervention by the instructor instead of waiting for the midterm grades or later. The error (residual) between predicted performance and actual performance was +0.51 for the sample (297) used to develop the multiple regression model (D'Souza and Maheshwari, 2009) which is utilized as the grade prediction equation in this study. This error (residual) has increased to +1.64 when the model was validated on a fresh sample (56). In both cases, there is an indication of the model providing a slightly optimistic prediction of performance. The error in the first part of the study (fall 2005 to spring 2007) appears to be lower due to a larger sample size and the fact that the model was applied on the sample used to develop the model. Further studies maybe required to improve the multiple regression model which currently explains 51% of the variations in the performance, and update the Grade Prediction Table based on fresh samples. Golding and McNamarah (2005) have reported a low percentage value of variation accounted for by their regression model concluding that effective predictors of performance is incomplete.

In order to utilize the model to predict and monitor performance over a larger student group taught by multiple instructors within the University, or among different colleges and universities it is recommended to implement similar course content, methodology, and grading system. A larger study including multiple instructors from different institutions would be required to arrive at a *universal predictive model*. In such a study, the dependent variable may be affected by different independent variables at the individual student level and university level. The individual students will be *nested* within universities thus requiring the application of Multilevel Regression Analysis (Bickel, 2007). Such large data sets could also be analyzed using *data mining* techniques (Han and Kamber, 2001).

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# GUIDED DEVELOPMENT OF REFLECTIVE THINKING IN THE OBSERVATIONS OF CLASSROOM TEACHERS BY PRE-SERVICE CANDIDATES

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## ABSTRACT

The literature identifies the need to develop reflective thinking in teacher candidates to improve the quality of instruction and classroom management provided in schools. Through the development of reflective thinking, congruence between theory and practice can be effectuated. This paper presents an innovative approach to the development of reflective thinking process in prospective teachers. It integrates the practices observed in the classroom with theory learned in the university. The Reflective Observation and Analysis Model presented in this paper has three distinct aspects. First, the aspiring teachers are presented Madeline Hunter's ITIP model for planning instruction. Second, classroom management is discussed in terms of the elements identified by Cantor, Wong, Curwan, and Mendler. The prospective teachers are provided a framework by which to reflect on the two elements in classrooms in which they are assigned to observe as part of their introductory field experience. Additionally, college instructor jointly observes selected classes with the aspiring teachers. Finally, when the prospective teachers return to the college setting the observations are systematically discussed in terms of relating practice to theory. This approach provides the aspiring teachers a framework that will aid them in becoming reflective practitioners.

## GUIDED DEVELOPMENT OF REFLECTIVE THINKING IN THE OBSERVATIONS OF CLASSROOM TEACHERS BY PRE-SERVICE CANDIDATES

By its very nature education is a profession in which the teacher, during the normal course of events, has limited interaction with other staff members. Thus an educator must be able to engage in an honest self-evaluation of his/her professional performance, effectively relate theory to practice, and modify/plan experiences that enhance learning and classroom environment.

Teachers need to be able to self-evaluate their use of strategies related to the various elements of instruction. They must be able to reflect on their practice and make accommodations in order to insure student learning (NCATE, 2008). The teacher education literature stresses the importance of developing reflective thinking by examining practices and arriving on a course of

action in a systematic way (Shulman, 1992). Aspiring teachers need to develop the ability to reflect about instruction and classroom management if they are to develop into competent educators. This process of self-evaluation can be nurtured and developed by the clinical instructor when conferencing with the student teacher if approached in a methodical fashion (Golland, 1998). It is imperative that those who are to become teachers learn to thoughtfully reflect upon their lessons and practices in order to maximize instructional effectiveness. It has been noted that traditionally some classroom teachers adopt methods that stress the efficiency of practice at the expense of student learning (Hatton, 1989). This has been the bane of traditional teacher education programs. In many instances aspiring teachers are placed with cooperating teachers that may very well emphasize drill and practice over teaching critical thinking and 21st-Century classroom procedures.

Hence we have the dilemma: How do pre-service teachers develop the ability to self evaluate? Lortie (1975) postulated that reflective practices are most beneficial when practiced among peers rather than individually. This lends itself to a mentoring/supervision process for aspiring teachers in which a university supervisor provides structured prompts to each teacher candidate with respect to the lesson observed and engages the candidate in reflecting on elements that worked well and those that needed improvement. Successful observation feedback keys in on a specific point which serve to focus post-conference discussions and thus build "reflectiveness" in the intern (Acheson and Gall, 1992).

*Impediments to the Development of Reflection in Aspiring Teachers*

"Reflection" is acknowledged as an important skill to be developed in teacher candidates by texts utilized in introductory teacher education courses. They, however, do little to rigorously develop it. For example, Kauchak and Eggen (2008) state, "...self-assessment requires that teachers develop a disposition for continually and critically examining their work"(p.18) while Hall, Quinn and Gollnick (2008) postulate that, "The intuition aspect of teaching develops through a process of reflection that is automatic, continuous and that draws on all manner of visual and sensory awareness..." (pp 329-330). While these sources affirm the importance of reflection, they do little to guide the development of this skill.

Another impediment to the development of the reflective process is the disconnect between theory (what the aspiring teacher learns from the university professors) and practice (what the aspiring teacher learns from his/her teaching mentor) (Kaufmann, 1992). Levine (2006) noted that:

One alumnus reported the problem with his teacher education program: 'I could talk about Carl Jung, scaffolding, cooperative learning groups, [and]the advantage of constructivism,' but had no idea what to do 'when Johnny goes nuts in the back of the class, or when Lisa comes in abused, or when Sue hasn't eaten in three days.' What he described is a symptom of a serious problem described by one education alumnus as 'an abyss' between theory and practice. (39)

This disconnect has been identified in the literature and addressed under the broad heading of "coherence" (Grossman, Hammerness, McDonald, & Ronfeldt, 2008). Aspiring teachers feel this schism viscerally. One study suggested that the university could help reduce it by providing experiences which connect theory to the everyday realities of teaching (Volante, 2006). Thus, if the quality of teacher education programs is to improve, it is necessary to incorporate college courses with field based experiences through the use of integrated teaching strategies (Darling-Hammond, 2006). In "A Sense of Calling" it was noted that new teachers felt that they had too much theory in college and not enough of the practical information necessary to meet the everyday challenges of teaching (Farkas, Johnson, & Foleno, 2000).

*Rationale for a Reflective Observation and Analysis Model*

This author has observed that the lack of coherence is most acute for prospective teachers when they are engaged in their first field experience. This is usually paired with an introductory course which, in many instances, also is the student's first education course. For these field observations the students are often required to keep a "journal" in which they are encouraged to concentrate on one facet of instruction and record their comments (Parkay & Stanford, 2007). Unfortunately, the logs often are often a chronological diary of observed events and lack meaningful analysis and reflection. Occasionally the prospective teachers are asked to 'reflect' on one particular event during the observation. The problem is that when the aspiring teachers present personal response 'journals' of this nature they believe that they have actually engaged in 'reflective thinking'. Prospective teachers, since they have no prior formal educational training, "reflect" based upon their personal experiences as students themselves. In the framework identified by Sparks-Langer et al. (1991) the teacher candidates, by reflecting through the process noted, seldom move further than discussing their experiences in terms of a description provided by a layperson.

True reflection should be guided by an analysis rooted in sound educational principles. Accepted pedagogy and sound educational theory need to serve as the foundation by which practice is evaluated; this knowledge, prior to field experiences, provides a framework by which the aspiring teachers are able to intelligently reflect on the field observation. This enables the aspiring teacher to comment on practice based upon the unique contextual factors and educational theory (Sparks-Langer et al., 1991).

*The Guided Reflective Observation and Analysis Model*

It is therefore critical to develop the ability to reflect in aspiring teachers if they are to develop into accomplished educators. The Guided Reflective Observation and Analysis Model presented in this paper utilizes the theory learned in the university as a vehicle for thoughtful consideration of practices observed in the classroom to develop reflective thinking in prospective

teachers. In the Guided Reflective Observation and Analysis Model approach the undergraduates, in the beginning of the course (prior to their field experiences), through lectures and focused activities are provided with the theoretical and practical pedagogical information in fundamental areas essential to effective teaching. With a knowledge base the aspiring teachers are able to effectively analyze and reflect on their field observations. The prospective teachers have a standard by which they can intelligently reflect on their experiences. Additionally, each of the prospective teacher candidates is paired with the university course instructor for selected field observations. In this way the novice's responses can be compared to the instructor's reaction to the lesson(s) and the aspiring candidate's interpretation of the lesson adequately critiqued.

The National Council for the Accreditation of Teacher Education (NCATE) in Standard 1 states that:

Candidates preparing to work in schools as teachers or other school professionals know and demonstrate the content knowledge, pedagogical content knowledge and skills, pedagogical and professional knowledge and skills, and professional dispositions necessary to help all students. (p.16)

To affect this standard the first element of the Guided Reflective Observation and Analysis Model focuses on providing the teacher candidates with the critical elements related to the knowledge and skills necessary to insure student learning. The teacher candidates are first taught the basic elements essential to the development of an educationally sound lesson (a modified version of Madeline Hunter's ITIP model for planning instruction). They are taught that lessons should engage students in the learning activity. The aspiring teachers are guided through a discussion that commences with the importance of educational goals and standards. They are introduced to the state standards, shown a website and provided examples of various standards in the disciplines in which the teacher candidates wish to major. An example of the New Jersey Core Content Curriculum Standards for Social Studies is shown below:

**6.4.8 E. Revolution and the New Nation (1754-1820)**

1. Discuss the background and major issues of the American Revolution, including the political and economic causes and consequences of the revolution. (NJCCS, 2004)

Next, the teacher candidates are introduced to the concept of educational objectives (Allen, 1998). They are taught that objectives should be written in measurable terms (SWBAT-students will be able to). The aspiring teachers are provided with several examples of objectives, are asked to develop objectives of their own and critique them. One such objective developed by the class in the area of Language Arts was: Students will be able to identify and classify different types of figurative language (Field Notes, 2007). The concept of an objective is further explored later through an explanation and discussion of Bloom's Taxonomy (Armstrong, 2002). The candidates are reintroduced to objectives in terms of knowledge (what a student needs to

know in order to successfully understand a lesson) i.e. lower level thinking skills a la Bloom and skills (what a student will be able to do upon completing the unit) (Wiggins & McTighe, 2005). Students are afforded the opportunity to practice writing objectives in terms of knowledge and skills.

In the third step the teacher candidates are taught the elements of an "anticipatory set" (Allen, 1998) or "hook" (Wiggins & McTighe, 2005) and provided with an example of a hook. The prospective teachers are encouraged to develop their own anticipatory sets. One hook developed by the class for the addition of time was that: The teacher should commence the class with a discussion of activities that children engage in after school. (If the teacher wishes he/she could also include the weekend in the activities.) The teacher could elicit from the students some of the things they do in their time after school (e.g. - soccer, using the computer, etc.) and from there the teacher would 'teach' the children how to add hours and minutes (Field Notes, 2007).

The various hooks/anticipatory sets are critiqued and discussed by the class as a whole. Integral to the discussion is the necessity to connect prior knowledge and interests in the anticipatory set.

In the fourth step the instructor engages the class in a discussion of the importance of identifying the instructional resources and materials necessary for the lesson. The importance of identifying time as an important resource is examined. This leads to a conversation on the body of the lesson. The first element explored is a conversation on the importance of identifying the component parts of a lesson in order to maintain the interests of learners. This includes, but is not limited to, the teacher lecturing, modeling an activity, and checking for understanding. The importance of differentiating instruction is noted along with the rationale for it. The concept of "wait time" is also introduced (Rowe, 1986). The class is provided with examples for each element discussed and asked to develop samples illustrating the elements.

In the fifth step, the instructor introduces the aspiring teachers to the concept of guided practice whereby the learners have the chance to demonstrate their knowledge of the lesson under the watchful guidance of the teacher. Included in this segment is the concept of "praise, prompt, and leave" (Fred Jones, 2007, pp 66-67).

The lesson then progresses to a discussion of the concept of closure in a lesson and its purpose. The class provides examples such as the use of exit slips or the completion of a KWL chart (Ogle, 1986). The aspiring teachers are led to conclude that closure is similar to the ending of a story or movie. It brings all the loose ends together to form a coherent conclusion to the lesson.

The necessity for students to be provided with independent practice and the various forms it may take is explored. The class is led to conclude that through independent practice the students demonstrate a mastery of the content and the learning solidified.

Finally, the teacher candidates are introduced to formal and informal assessments. The aspiring teachers are encouraged to provide examples and the instructor supplements them with other illustrations. In concluding, the instructor stresses to the teacher candidates that not all of

the noted elements need to be contained in every class. The developing teachers are encouraged to provide instances when certain elements may be omitted from a lesson.

Upon the culmination of these lectures the undergraduates are provided with paradigm that identifies the essential elements of a successful lesson (See Appendix I). They have a viable model to which they utilize to analyze their classroom field observations; they have a knowledge base that can used to guide (structure) their reflecting (See Figure 1. University Setting A).

The second element of the Guided Reflective Observation and Analysis Model focuses on the skills and knowledge needed to develop and maintain a classroom management approach that provides an environment conducive to learning. The U.S. Department of Education's Institute of Education Sciences reported that problematic student behavior was cited as a source of dissatisfaction by forty-four percent of the teachers who left the profession in the 1999-2000 academic year (U.S. Department of Education, 2005). The positive relationship between classroom management and effective instruction is discussed. This is followed by a discourse on the characteristics of a well-managed class.

The instructor then leads a discussion on the similarity between a classroom environment and society at large. The one noted is that society has rules in order to function effectively. Therefore it stands to reason that a classroom should have appropriate rules as well. This leads to a conversation on the necessity to develop classroom rules. The class is informed that literature recommends that there should be three to five rules for an effective classroom (Shank, 2002). The relationship of classroom rules to Piaget's Theory on the Stages of Development (Langer & Killen, 1998) in children is discussed and noted. This leads to the conclusion that valid rules for students need to be observable and unequivocally predicated. Several examples of classroom rules that have been developed by teacher candidates are shown below:

- Follow directions the first time given
- Don't interrupt when someone else is speaking
- Keep hands, feet and objects to yourself
- No swearing, teasing or yelling
- Don't leave the room without permission (Field Notes, 2007)

The consequences that a classroom teacher should implement when the rules are not followed are the next element discussed. The instructor notes that there should be four to five consequences, hierarchical in nature, and need not be severe in order to be effective (Shank, 2002). In other words, the first consequence should be a warning and then progress to the ultimate removal from the classroom. Examples of consequences utilized by classroom teachers at various levels are presented to the undergraduate students and their merits discussed.

- First Offense: A warning will be issued and the student will be reminded of the rule that was broken.
- Second Offense: Stay after class to discuss the behavior.

- Third Offense:   A call home to parents.
- Fourth Offense: A half hour detention after school.
- Fifth Offense:   Removal from the classroom (Field Notes, 2008)

The importance of developing a consequence to protect the safety and learning environment is discussed and the following sample Safety Clause shared: If a student endangers him/herself, others or defies authority the student will be immediately removed from the class. (Field Notes, 2008)

The aspiring teachers are taught to differentiate between a consequence and a punishment.   In the lecture and discussion, it is emphasized that the goal of an effective classroom management program is for the children to develop an internal locus. Students with a well developed internal locus of control accept responsibility for their actions, while those with an external locus of control attribute their actions to factors in the environment.

The aspiring teachers are acquainted with the concept of positive reinforcement (Skinner, 2005) and the rationale for it.  The class is asked to identify positive reinforcements that are used in various life situations. This directly leads to a discussion of the necessity to provide supportive feedback to students in recognition of their efforts (Shank, 2002).   The positives could be material or non-material in nature. The class is asked to provide examples of ways that a teacher may offer reinforcement of positive behavior. Several examples of positives utilized by teachers are noted below:

- Positive praise
- Positive notes/calls home
- Self-selected activities
- Music played while doing class work (Field Notes, 2007)

The instructor finally lectures on the necessity of development of adequate classroom procedures. If the teacher does not develop adequate procedures, then students will not be able to function efficiently (Wong, 2001).  The instructor explains to the prospective teachers that rules are in effect all the time and have consequences if they are not followed, while procedures are simply the way that things should be done and are without consequences (Wong, 2001).  The instructor asks for several examples of situations where procedures are necessary, additional examples are shown, and then discussed (See Figure 1. University Setting B).

Following this series of lectures, the prospective teachers are equipped with a fundamental knowledge of the basics of an educationally sound lesson and the elements necessary to effectively manage a classroom.   At this point the undergraduate students commence their field observations. They are required to observe the teaching of a lesson and reflect upon it utilizing the criteria developed in the lectures.  The teacher candidates utilize the framework provided as a guide to complete this task (Appendix A).  During the next lesson the

prospective teachers are asked to analyze the classroom management techniques in light of the information learned from the classroom instruction utilizing the guide provided (Appendix B). Finally the novice educators are asked to comment on the general classroom atmosphere according to the educational principles enunciated in classroom discourses (Appendix C). The college students are required to submit a written response dealing with the noted areas the next time their class meets.

The third element of the Guided Reflective Observation and Analysis Model is that the instructor accompanies the aspiring teachers on their field visits, observes in several classrooms and responds to the same prompts as the students. The advantage of this approach is that it provides the aspiring teachers an opportunity to utilize the educational concepts learned in the university and apply them in a real life setting; this insures that when the class is analyzing a specific case it has the benefit of an educationally sound knowledge base rather than engaging in a mass pooling of ignorance. The guided observation approach helps bridge the gap between theory and practice. When the undergraduates return to class they have the opportunity to discuss their visitation in a systematic manner based on accepted educational principles. The aspiring teachers discuss their analysis and the instructor, using a Socratic approach, leads the students to develop a deeper insight into the art of teaching (See Figure 1. Field Observation C).

After one guided observation, a college student noted that the teacher in a class he observed had excellent classroom management skills because the students were on task and worked well. The professor, because he also observed the lesson, was able to call attention to several teacher behaviors that contributed to a positive classroom climate. For example, when a student was not on task the teacher walked over to the student and spoke softly to the student asking him to attend to the assigned task. This is a technique that would have been unnoticed had the college instructor not been present during the class. Another technique utilized was that the teacher used humor at times when correcting student behavior. For example: At one point the class was asked to take out their notes from the previous day. One boy did not comply with the request. The teacher said, "Will everyone, and Jose (fictitious name), please take out your notes." Jose looked up at the teacher, smiled sheepishly and complied with the request (Field Notes, 2008). These incidents, in turn, provided the basis for a portion of the next class lecture in which the aspiring teachers were engaged in a discussion of "How to unobtrusively keep students on-task." The professor moderated the discussion and provided the teacher candidates with examples (such as those observed) and educational literature related to the topic.

Another college student wrote that a teacher did not have an anticipatory set but rather merely went over the homework from the previous day. The college instructor also observed the class and noted that the homework was structured in a manner that not only reinforced previous learning but also provided a basis for the lesson of the day and ascertained prior knowledge of the students. Had the college instructor not been present, the student would not have realized that the technique observed was successful in bridging the pervious lesson to the one presented

that day (Field Notes, 2008). This led to a discussion of the anticipatory set in class and provided an opportunity to expand the concept.

The structured analysis of the observations by the teacher candidates provides a unique opportunity for the use of a real life case study approach to aid in the development of the critical thinking skills and linking theory to practice. Two teacher candidates observed a class and reported on what they felt was a unique way to provide positive praise to students. The college instructor was also present in the classroom. In the class, the teacher called out the grades the students received on a test and complimented those who scored well. During the lecture session at the university there was a discussion of the practice. Several of the aspiring teachers approved of this method to provide positive reinforcement to students. The professor presented a mini-lecture on the concept of "unanticipated consequences" and the effect that having someone's name called out who received a poor grade on a test or quiz (See Figure 1. University Setting D). The teacher candidates were asked to recall the concept of "supportive feedback" and the professor reviewed several ways to provide supportive feedback. The teacher candidates at the culmination of the session concluded that while some of the students would feel good about doing well on an assignment others might be embarrassed or even resentful of having their grade known by everyone. This led to a dialogue of how a teacher could provide positive reinforcement without causing others to be embarrassed. Some ways the teacher candidates brainstormed were: Writing encouraging comments on the test, providing comments personally to the students during while they work independently or as the students leave the class (Field Notes, 2008). The complete model is presented in Figure 1.
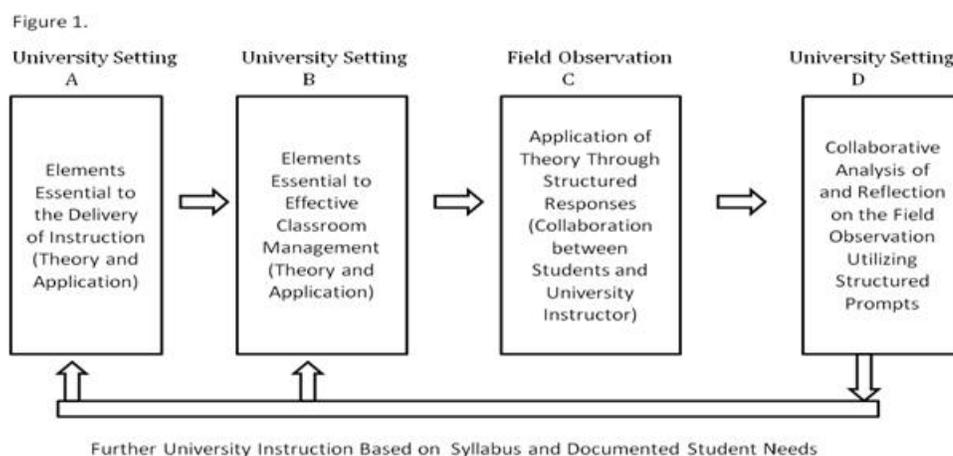
Figure 1.



Figure 1. Guided Reflective Observation and Analysis Model. This figure is a graphic representation of the elements of the model and their relationship to one another.

## CONCLUSION

The Guided Reflective Observation and Analysis Model provides aspiring teachers the opportunity to connect theory to practice through the use of 'real life' case studies based upon classroom observations. This structured approach enables teacher candidates to link theory to practice. Utilizing this methodology, the college instructor has the opportunity to guide the development of true reflective thinking based upon sound educational principles and theories.

The teacher candidates, through participation in class lectures and individual conferences, are able to successfully develop the process of reflective thinking. In conclusion, the utilization of the Guided Reflective Observation and Analysis Model enables aspiring teachers to successfully analyze the learning/classroom environment in light of educational theory. The application of this approach, while labor intensive, systematically allows teacher candidates to develop a framework whereby there is greater coherence between what is taught in the university and what actually happens in the classroom.

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## Appendix A
## Lesson Analysis

This task requires the student to observe a class and determine if the following elements are present in the lesson. The student should also identify the components of each element and present a summary evaluation including areas that could be improved. The report should not be in a yes/no format but rather as a narrative.

1. Educational Objectives and Standards:
2. Anticipatory Set
3. Instructional Materials & Resources
4.  Procedures/Strategies (Were mini-lessons utilized?)- Were higher level thinking skills stressed in the questioning of the students? Was there evidence of differentiation of instruction?
5. Guided Practice
6. Closure & Extension
7. Assessment/Evaluation
8.  What was your overall evaluation of the lesson?  Did it work? What would you have changed if you were teaching the lesson?

## Appendix B
## Classroom Management

This task requires the student to observe a class and determine which of the following elements of classroom management were present. The student should also identify the components of each element and present a summary evaluation including any areas that could be improved. The report should not be in a yes/no format but rather as a narrative.
1. Expectations are clearly communicated to the class (rules)
2. Consequences are clearly communicated- (Enumerate as needed)
3. Positives are specified- (Enumerate as needed)
4. Were students always on task? If not how did the teacher redirect them? Was the approach effective? If the approach was not effective what would you have done?
5. Did any students misbehave? If so how were the misbehaviors handled? Was the approach effective? If the approach was not effective what would you have done?

## Appendix C
## General Observations

1. General Class Atmosphere
2. Did the teacher develop higher level thinking skills? If not how would you have incorporated these skills? If the teacher did how did the teacher do it? Provide specific examples.
3. Which activities/ lessons went well? Why do you think they worked?
4. Which activities/lessons did <u>not</u> work out well? Why do you think they didn't work out? What would you do to make the lesson successful?

# PRINCIPAL DESIRABILITIY FOR PROFESSIONAL DEVELOPMENT

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## ABSTRACT

*Principals are often required to operate educational programs under a growing number of federal and state mandates for which they have limited knowledge and available recourses. This paper presents the results of a survey of 102 principals from 52 elementary schools, 25 middle schools, and 25 high schools within the state of Virginia. The survey instrument was administered during the 2008 school year and contained 25 professional development statements that previous research indicated were necessary for practicing principals. The primary purpose of this study was to investigate the perceptions of Virginia public school principals concerning their desirability for professional development training in order to meet current accountability measures. The results were analyzed by the following demographic characteristics: principal experience level, level of school (elementary, middle, or high school), the percentage of minority children, children with IEPs, children with limited English proficiency, and children in poverty; Title 1 status; and AYP accreditation. These results have implications for public school systems to determine principal needs and provide the necessary training to meet current mandates. Additionally, this information would allow advocacy and outreach professional organizations for school principals to design workshops that focus their efforts on the most needed professional development areas.*

## INTRODUCTION

Today's American educational system is facing a revolutionary change involving high-stakes testing designed to raise student achievement. The No Child Left Behind Act (NCLB) is potentially the most significant educational initiative to have been enacted in decades (Simpson, LaCava, & Graner, 2004), and NCLB affects virtually every person employed in the public school system (Heath, 2006). This legislation is unprecedented in its expectation that all students, regardless of disability, native language, race, socioeconomic status, or ethnicity, meet the standards in English and mathematics. Albrecht and Joles (2003) verified that NCLB outlined the most rigorous and exacting set of standards-based strategies; it was enacted for reforming schools and implemented a mandate that all schools demonstrate adequate yearly progress.

All schools must make detailed annual reports on the progress of all children, as well as report the progress of four subgroups: minority children, children with disabilities, children with limited English proficiency, and children from low-income families (Heath, 2006). While schools that meet adequate yearly progress receive financial rewards, public recognition, and accolades, those schools that do not meet minimum performance standards receive sanctions and are at risk of the state taking control of their school for state-initiated improvement.

The rigorous accountability standards of NCLB are undeniable. The effects are far-reaching, and every individual within each school community has a vested interest in this era that demands that all children meet these high standards, regardless of race, language, socioeconomic status, or disability. Without question, the No Child Left Behind Act reinforces a change in the way school leadership is perceived in the United States. The Institute for Educational Leadership (2002) offers the following:

> *Even as communities shine a public spotlight on principals when their schools' test scores are released and prescribe stiff penalties for many when their schools perform below expectations, current principals find very little in their professional preparation or ongoing professional development that equip them for this new role. Nor are they supported in this leadership role by their school districts, which, for decades, have expected principals to do little more than follow orders, oversee school staff and contain conflict. So instead, principals mainly stick with what they know, struggling to juggle the multiplying demands of running a school in a sea of rising expectations, complex student needs, enhanced accountability, expanding diversity, record enrollments and staff shortfalls. In short, the demands placed on principals have changed, but the profession has not changed to meet those demands.* (p.2-3)

The impact of the NCLB on the role of the principal is daunting and complicated by the notion that many principals are learning how to cope with accountability pressures while they juggle other responsibilities. The Institute for Educational Leadership (2002) referenced a recent survey of K–8 principals in which 97.2% rated on-the-job experience as having the most value to their success as principals. In addition, this report noted that principals generally have few opportunities for networking or coaching, which would provide a vehicle for peer support, sharing information and learning best practices.

The Institute for Educational Leadership argued (2002), "There is no alternative. Communities around the country must 'reinvent the principalship' to enable principals to meet the challenges of the 21$^{st}$ century, and to guarantee the leaders for student learning that communities need to guide their schools and children to success" (p.3-4). Therefore, this study assesses principal desirability for professional development. The paper is organized in the following manner: The first section provides a review of the available literature. The second section discusses the design and the administration of the survey questionnaire. The third section presents the study's results, and the final section discusses the overall conclusions from the study.

# REVIEW OF LITERATURE

Over the last decade, an increasingly strong movement toward school accountability has emerged. According to Moe (2003), its message is a simple one: public schools should have strong academic standards; tests should be administered to determine what students are learning; and students, as well as the adults responsible for teaching them, should be held accountable for meeting the standards.

Thus, educational systems have been forced to shift their focus from educating the more financially advantaged and easier-to-teach children to educating all children, including those who are more difficult to teach due to difference, disadvantage, or disability (Allington & McGill-Franzen, 1995). One could argue that educational systems have developed and matured as a result of the federal regulations which are currently being aligned with Virginia's accountability system.

President George W. Bush signed the No Child Left Behind Act of 2001 into law on January 8, 2002, as the reauthorization of the 1965 Elementary and Secondary Education Act. NCLB set forth new requirements for public schools across the United States to show evidence that all students are learning and making adequate yearly progress. Academic standards set by states directed that schools be held accountable for results, and increased resources and flexibility would be offered by the federal government (U.S. Department of Education, 2007). President Bush described this new law as "the cornerstone of [his] administration," and during his first week in office in January, 2001, he stated, "These reforms express my deep belief in our public schools and their mission to build the mind and character of every child, from every background, in every part of America" (U.S. Department of Education, February 2004, p. 1).

Certainly, the notion of accountability is not a new one, as one form of accountability or another has always been present in American public schooling (Sirotnik, 2004). President Bush, however, put the full force of federal authority behind standards-based reform (Cuban, 2004). The central justification for this legislation was that schools and teachers were leaving children behind (Gerstl-Pepin, 2006). The legislation demands more of states and school districts than any previous federal education law (Jennings & Kober, 2004). Former U.S. Secretary of Education, Rod Paige (June, 2002), acknowledged that, while federal policy has had a significant impact on America's schools and children since the enactment of the Elementary and Secondary Education Act in 1965, many American students continued to lag behind.

Under NCLB, schools were to ensure that 100% of students achieve at levels identified as "proficient" by the year 2014 and to make mandated progress toward this goal each year. NCLB has far-reaching implications for those who work in public education. NCLB was different from other initiatives in that its main thrust was to promote high standards by holding schools and students accountable for outcomes rather than inputs or regularizations (Heinecke, Curry-Conrcoran, & Moon, 2003).

## THE ERA OF PRINCIPAL ACCOUNTABILITY

According to Lashway (2000), "Accountability is not just another task added to the already formidable list of the principal's responsibilities. It requires new roles and new forms of leadership carried out under careful public scrutiny while simultaneously trying to keep day-to-day management on an even keel" (p. 13). Principals' pre-service and in-service training may not have prepared them for the dual challenge of understanding data-driven decision making and guiding their learning communities through the changes in attitude and behavior that the high stakes accountability environment demands (Bennett, 2002). Additionally, accountability, by definition, is about a school's obligation to society, so it will never be just an internal matter. The principal is the point person in responding to community concerns and, at the same time, proactively telling the school's story (p. 13).

Although past accountability standards provided a less complicated and less public approach, this is not the case in the present era of high stakes testing. Comparisons of scores are inevitable in this environment, and test-driven decisions have a ripple effect on the community. Accountability must be shared among all participants because far-ranging results depend on cooperation and collaboration (Bennett, 2002), and the primary responsibility for meeting outcomes belongs to the principal. Even the severest critics of high stakes testing acknowledge that assessments are necessary for a variety of purposes – public accountability, diagnosis of student strengths and weaknesses, and evidence for teachers and parents that students are learning what they should (Lewis, 2000). Where they disagree about assessment, however, is where a single test is used to make major decisions about a student, such as high school graduation or promotion, and when that test becomes the basis of decisions that significantly affect the academic outcomes of a student in school.

Consequences for students include whether they pass or fail, whether they qualify for a diploma, and/or whether they are granted access to specific programs. The implications for high stakes testing are further reaching, as the resulting consequences extend to teachers, principals, schools, and school districts. Consequences for schools and districts include which ones receive awards for high performance and which ones are granted additional funding to try to improve low scores. For low-scoring schools, consequences include loss of accreditation, reconstitution, or closure.

## THE ROLE OF THE PRINCIPAL

One can easily see that the role of the principal has changed given today's high stakes accountability. The public expects principals to deliver results; however, such high stakes testing and the resulting accountability add intense stress to a principal's workload.

Cohen (2001) noted that the operational demands that principals have always faced – school safety, keeping the buses running on schedule, contending with mounds of paperwork,

disciplining students, mediating adult interrelationships, handling central office requests and requirements, etc. – have not gone away. However, the principal also needs special capabilities for leadership in order to be an instructional leader: recruiting teachers loyal to the common task of teaching a specific group of children, knowing individual teachers well enough to suggest specific improvements, and creating a culture in which deep knowledge of instruction and learning serves as the foundation for an interdependent professional community (Fink & Resnick, 2001).

Principals currently are held accountable for the progress of their students, yet most principals spend relatively little time in classrooms and even less time analyzing instruction with teachers (Fink and Resnick, 2001). Principals increasingly indicate that these jobs are simply not doable (Institute for Educational Leadership, 2002). Among many professional development needs, perhaps none is more critical in the high stakes accountability environment than the need to understand and analyze data in order to align assessments, standards, curriculum, and instruction (Bennett, 2002).

Principals must be able to make the appropriate data-driven decisions and know how to prioritize among many daily challenges. This notion is validated by Lipsitz, Mizell, Jackson, and Austin (1997), who maintain that data-driven decision making is a necessary element of reform. Not only must the principal understand and engage in data-driven decision making, but the stakeholders must also be involved in these decisions. Distributed leadership and decision sharing make the principal's job both more manageable and more complex (Cohen, 2001). When principals engage parents and teachers in the decision-making process, they are employing a strategy for arriving at better decisions. In the past, school accountability was much less complicated and less public. If principals determined the needs of their specific learning communities and met them, this approach was feasible. However, in a learning community driven by high stakes testing, it is not. In a high stakes accountability environment, comparisons of scores to other schools are inevitable and test-driven decisions have a ripple effect on the community. Accountability must be shared among all participants because far-ranging results depend on cooperation and collaboration (Bennett, 2002, p.4).

Not only are principals expected to engage parents and teachers in the decision-making process, but principals are also expected to take the lead in engaging other citizens in supporting student achievement and school improvement (Cohen, 2001). Education leaders are encouraged by Lefkowits and Miller (2003) to find time to effectively reach out to the public, engage them in school reform efforts, and respond to the concerns expressed, or they run the risk of having their accountability policies become irrelevant to the very people the policies are intended to reassure. In the high stakes accountability environment, school principals must simultaneously visualize the future of the learning community while meeting the adjustment needs of those they lead (Bennett, 2002, p.4). The Institute for Educational Leadership's (IEL) Task Force on the Principalship (2000) verified the notion,

Being an effective building manager used to be good enough.  For the past century, principals mostly were expected to comply with district-level edicts, address personnel issues, order supplies, balance program budgets, keep hallways and playgrounds safe, put out fires that threatened tranquil public relations, and make sure that busing and meal services were operating smoothly.  And [*sic*] principals still need to do all those things.  But [*sic*] now they must do more. (p.2)

## RESEARCH METHODOLOGY

This study solicited principals' perceptions of their desirability for professional development as it related to the high stakes accountability in terms of current legislation.  This study was designed to address the following specific questions:

1) How do principals *rate* their desirability for professional development as it relates to meeting the high stakes accountability of the No Child Left Behind Act?

2) Do the following factors affect principals' perceptions of their desirability for professional development:  experience level of the principal, level of school (elementary, middle or high school), the percentage of minority children, the percentage of children with disabilities, the percentage of children with limited English proficiency, the percentage of children in poverty within the school's population, the school's current Title 1 funding status, and the school's current AYP accreditation?

3) How do principals *rank* their desirability for professional development as it relates to meeting the high stakes accountability of the No Child Left Behind Act?

The population for this study was composed of Virginia principals randomly selected from school divisions. A letter along with the principal survey was sent to all school divisions within Virginia asking for the Superintendents' permission to distribute surveys to principals within their school divisions. The population for this study was drawn from 67 school divisions upon permission from those Superintendents.  Using a stratified random numbers table, a sample size of 30% was taken from 332 elementary, 114 middle, and 112 high schools within the Commonwealth of Virginia so that surveys were randomly selected and sent to 100 elementary schools, 34 middle schools and 34 high schools. Only those schools in participating divisions were in the final sample.

Once all of the surveys were returned, they were examined for completion. Various descriptive and demographic data were collected about the principals and their schools.  A total of 102 surveys were returned; 52 surveys were returned from elementary schools, 25 surveys were returned from middle schools, and 25 surveys were returned from high schools.  The overall response rate was 62.2%.  Inadequate surveys were eliminated.

Quantitative statistical methods were used to answer Section A demographic questions 1-8. Descriptive statistics including frequencies, percentages, means, and standard deviations were utilized.  In Section B, survey questions 9-28 asked principals to rate their desirability for the 20

statements of professional development as it relates to the high stakes accountability in meeting the No Child Left Behind Act. One-way analysis of variance (ANOVA) was utilized, with a post-hoc t-test to determine differences between groups if the one-way analysis of variance produced statistically significant F. In Section C, principals were asked to rank their top 10 statements of professional development desirability as it relates to the high stakes accountability in meeting the No Child Left Behind Act. Statements were rank-ordered by means utilizing descriptive statistics.

## RESULTS

This study examined the perceptions of Virginia principals concerning their desirability for professional development relating to the current high stakes accountability legislation. The research questions guiding this study include:

1) How do principals *rate* their desirability for professional development as it relates to meeting the high stakes accountability of the No Child Left Behind Act?

2) Do the following factors affect principals' perceptions of their desirability for professional development: experience level of the principal, level of school (elementary, middle or high school), the percentage of minority children, the percentage of children with disabilities, the percentage of children with limited English proficiency, the percentage of children in poverty within the school's population, the school's current Title 1 funding status, and the school's current AYP accreditation?

3) How do principals *rank* their desirability for professional development as it relates to meeting the high stakes accountability of the No Child Left Behind Act?

To answer these questions, a survey was developed, based upon twenty desirability statements as supported by research for principal professional development training.

## DEMOGRAPHIC AND DESCRIPTIVE DATA

Various descriptive and demographic data were collected about the principals and their schools. Using a stratified random numbers table, a sample size of 30% was taken from the population. A total of 102 surveys were returned; 52 surveys were returned from elementary schools, 25 surveys were returned from middle schools, and 25 surveys were returned from high schools. The overall response rate was 62.2%. The data was summarized using frequencies and percentages for the total number of principals (102) responding to the survey. The missing data points were also reported under the category of "No Response."

| Table 1: Principals' School Levels | | | |
|---|---|---|---|
| | Elementary | Middle | High |
| Frequency | 52 | 25 | 25 |
| Percent | 51.0% | 24.5% | 24.5% |

| Table 2: Level of Experience as a Principal | | | | |
|---|---|---|---|---|
| | 1-5 years | 6-10 years | 11-20 years | 20+ years |
| Frequency | 54 | 26 | 17 | 5 |
| Percent | 52.9% | 25.5% | 16.7% | 4.9% |

| Table 3: Minority Children | | | | | |
|---|---|---|---|---|---|
| | 0-25% | 26-49% | 50-74% | 75-100% | No Response |
| Frequency | 75 | 19 | 7 | 0 | 1 |
| Percent | 73.5% | 18.6% | 6.9% | 0% | 1.0% |

| Table 4: Children with IEPs | | | | | |
|---|---|---|---|---|---|
| | 0-25% | 26-49% | 50-74% | 75-100% | No Response |
| Frequency | 91 | 6 | 4 | 0 | 1 |
| Percent | 89.2% | 5.9% | 3.9% | 0% | 1.0% |

| Table 5: Children with Limited English Proficiency | | | | |
|---|---|---|---|---|
| | 0-25% | 26-49% | 50-74% | 75-100% |
| Frequency | 96 | 6 | 0 | 0 |
| Percent | 94.1% | 5.9% | 0% | 0% |

| Table 6: Children in Poverty | | | | |
|---|---|---|---|---|
| | 0-25% | 26-49% | 50-74% | 75-100% |
| Frequency | 41 | 37 | 17 | 7 |
| Percent | 40.2% | 36.3% | 16.7% | 6.9% |

| Table 7 Title 1 Status | | | | |
|---|---|---|---|---|
| | Schoolwide Title 1 Funding | Title 1 Funding | No Title 1 Funding | No Response |
| Frequency | 17 | 34 | 48 | 3 |
| Percent | 16.7% | 33.3% | 47.1% | 2.9% |

| Table 8: School's Current Accreditation Status | | | | |
|---|---|---|---|---|
| | Fully Accredited | Accredited With Warning | Accreditation Denied | Conditionally Accredited |
| Frequency | 88 | 10 | 2 | 2 |
| Percent | 86.3% | 9.8% | 2.0% | 2.0% |

## PRINCIPAL DESIRABILITY RATING

The survey consisted of twenty statements seeking principal perceptions about desirability for professional development training. These statements were referred to as *Statements of Desirability*.

| Table 9: Statements of Desirability |
|---|
| Redesigning my school in order to increase my school's effectiveness |
| Implementing research-based curricula |
| Ensuring that my teachers are trained in research- based instructional methods |
| Providing core reading knowledge to novice teachers who did not get this training in college |
| Preparing for sudden increases in my student population as my school's effectiveness increases |
| Juggling the demands of running a school in a sea of rising expectations, complex student needs, enhance accountability, expanding diversity, record enrollments and staff shortfalls |
| Raising the achievement levels of minority students |
| Raising the achievement levels of students living in poverty |
| Raising the achievement levels of new English learners (ESL) |
| Raising the achievement levels of students with disabilities |
| Understanding data-driven decision making |
| Guiding my learning community through the changes in attitude and behavior that high stakes accountability environment demands |
| Designing curriculum that meets the learning needs of all students and is aligned with state and local standards |
| Knowing what constitutes good instructional practice |
| Coaching and guiding teachers in the continual improvement of their educational knowledge and practice |
| Understanding the foundations of effective special education |
| Understanding and analyzing data in order to align assessment, standards, curriculum, and instruction |
| Understanding how to interpret research findings and evaluate data |
| Engaging the school community in my school reform efforts |
| Visualizing the future of my specific learning community while meeting the adjustment needs of my community |

## Research Question 1

The first research question asked principals to assess their desirability for professional development as it relates to meeting high stakes accountability. Specifically, the statement read, "The following indicates my level of desirability for professional development training as it relates to: each of the twenty *Statements of Desirability*." A Likert scale was provided, with a range of Strong (1), Moderate (2), Little (3), and None (4). Surveys which were returned with blank data were included in the "No Response" category. The principals assessed their overall desirability for professional development training in the twenty categories to be Strong to Moderate. To further summarize the data, the number of principals with Strong Desirability (response 1) and No Desirability (response 4) was again aggregated and compared.

The data suggests desirability for principal professional development training. The reader should note that there were only six statements toward which one or more principals noted they had No Desirability. Those statements were (1) redesigning my school in order to increase my school's effectiveness, (2) providing core reading knowledge to novice teachers who did not get this training in college, (3) preparing for sudden increases in my student population as my school's effectiveness increases, (4) raising the achievement levels of minority students, (5) raising the achievement levels of students living in poverty, and (6) raising the achievement levels of new English learners (ESL).

| Table 10: Rank-Ordered Statements by Level of Desirability Means | | | |
|---|---|---|---|
| Rank Order | Statement # | Statement | Mean |
| 1st | 3 | Ensuring that my teachers are trained in research-based instructional methods | 1.26 |
| 2nd | 10 | Raising the achievement levels of students with disabilities | 1.30 |
| 3rd | 8 | Raising the achievement levels of students living in poverty | 1.32 |
| 4th | 15 | Coaching and guiding teachers in the continual improvement of their educational knowledge and practice | 1.37 |
| 5th | 2 | Implementing research-based curricula | 1.47 |
| 6th | 14 | Knowing what constitutes good instructional practice | 1.48 |
| 7th | 16 | Understanding the foundations of effective special education | 1.48 |
| 8th | 4 | Providing core reading knowledge to novice teachers who did not get this training in college | 1.51 |
| 9th | 13 | Designing curriculum that meets the learning needs of all students and is aligned with state and local standards | 1.58 |
| 10th | 7 | Raising the achievement levels of minority students | 1.59 |
| 11th | 17 | Understanding and analyzing data in order to align assessment, standards, curriculum, and instruction. | 1.63 |
| 12th | 12 | Guiding my learning community through the changes and attitude and behavior that high stakes accountability environment demands | 1.64 |
| 13th | 11 | Understanding data-driven decision making | 1.71 |
| 14th | 18 | Understanding how to interpret research findings and evaluate data | 1.73 |
| 15th | 6 | Juggling the demands of running a school in a sea of rising expectations, complex student needs, enhanced accountability, expanding diversity, record enrollment, and staff shortfalls | 1.75 |
| 16th | 19 | Engaging the school community in my school reform efforts | 1.79 |
| 17th | 9 | Raising the achievement levels of new English learners | 1.87 |
| 18th | 20 | Visualizing the future of my specific learning community while meeting the adjustment needs of my community | 1.90 |
| 19th | 1 | Redesigning my school in order to increase my school's effectiveness | 2.10 |
| 20th | 5 | Preparing for sudden increases in my student population as my school's effectiveness increases | 2.31 |

The mean of each of the twenty Statements of Desirability was calculated, and the statements were rank-ordered from the lowest mean (greatest level of desirability) to the highest mean (lowest level of desirability). The rank-ordered mean for each of these twenty-eight Statements of Desirability was also calculated and reported in Table 10.

| Rank Order | Statement Number | Statement | Mean |
|---|---|---|---|
| | | **Table 11: Test of Relative Importance** | |
| | | **Cluster of Relative Importance #1** | |
| 1st | 3 | Ensuring that my teachers are trained in research-based instructional methods | 1.26 |
| 2nd | 10 | Raising the achievement levels of students with disabilities | 1.30 |
| 3rd | 8 | Raising the achievement levels of students living in poverty | 1.32 |
| | | **Cluster of Relative Importance #2** | |
| 4th | 15 | Coaching and guiding teachers in the continual improvement of their educational knowledge and practice | 1.37 |
| 5th | 2 | Implementing research-based curricula | 1.47 |
| 6th | 14 | Knowing what constitutes good instructional practice | 1.48 |
| 7th | 16 | Understanding the foundations of effective special education | 1.48 |
| | | **Cluster of Relative Importance #3** | |
| 8th | 4 | Providing core reading knowledge to novice teachers who did not get this training in college | 1.51 |
| 9th | 13 | Designing curriculum that meets the learning needs of all students and is aligned with state and local standards | 1.58 |
| 10th | 7 | Raising the achievement levels of minority students | 1.59 |
| 11th | 17 | Understanding and analyzing data in order to align assessment, standards, curriculum, and instruction. | 1.63 |
| | | **Cluster of Relative Importance #4** | |
| 12th | 12 | Guiding my learning community through the changes and attitude and behavior that high stakes accountability environment demands | 1.64 |
| 13th | 11 | Understanding data-driven decision making | 1.71 |
| 14th | 18 | Understanding how to interpret research findings and evaluate data | 1.73 |
| 15th | 6 | Juggling the demands of running a school in a sea of rising expectations, complex student needs, enhanced accountability, expanding diversity, record enrollment, and staff shortfalls | 1.75 |
| | | **Cluster of Relative Importance #5** | |
| 16th | 19 | Engaging the school community in my school reform efforts | 1.79 |
| 17th | 9 | Raising the achievement levels of new English learners | 1.87 |
| 18th | 20 | Visualizing the future of my specific learning community while meeting the adjustment needs of my community | 1.90 |
| | | **Cluster of Relative Importance #6** | |
| 19th | 1 | Redesigning my school in order to increase my school's effectiveness | 2.10 |
| 20th | 5 | Preparing for sudden increases in my student population as my school's effectiveness increases | 2.31 |

Those statements with the highest desirability (lowest mean) for professional development training included ensuring teachers are trained in research-based instructional

methods and raising the achievement levels of students with disabilities and students living in poverty. Those statements with the lowest desirability (highest mean) for professional development training included visualizing the future needs of the school's learning community, redesigning the school in order to increase the school's effectiveness, and preparing for sudden increases in student population.

The reader should note that some means were so similar that there may be limited practical differences between them. To further differentiate, a Test of Relative Importance (Table 11) was calculated based on desirability statement means using a one-sample t-test. The Test of Relative Importance used the rank-ordered desirability statements to find statements of the same level of importance relative to each other.

## Research Question 2

Research Question 2 asked, "Do the following factors affect principals' perceptions of their desirability for professional development: experience level of the principal, level of school (elementary, middle or high school), the percentage of minority children, the percentage of children with disabilities, the percentage of children with limited English proficiency, the percentage of children in poverty within the school's population, the school's current Title 1 funding status, and the school's current AYP accreditation?".

For Table 12, analysis of variance (ANOVA) was utilized to determine if differences in principals' desirability concerning professional development are related to the above noted demographic characteristics. When differences among school levels were determined to be statistically significant, the post-hoc Scheffe test was utilized to determine differences between the sub-groups.

## Research Question 2.1

Sub-question 2.1: Are differences in principals' desirability concerning professional development related to the school level of the principal?

For the purpose of this study, principal experience was divided into three levels: Level 1 - Elementary, Level 2 - Middle School and Level 3 - High School. The results are summarized in Table 12.

As observed in Table 12, the analysis of variance revealed six factors that were statistically significant as a function of school level:

- 1 Redesigning my school in order to increase my school's effectiveness,
- 4 Providing core reading knowledge to novice teachers who did not get this training in college,
- 5 Preparing for sudden increases in my student population as my school's effectiveness increases,

- 10 Raising the achievement levels of students with disabilities,
- 11 Understanding data-driven decision making, and
- 20 Visualizing the future of my specific learning community while meeting the adjustment needs of my community.

| | | | N | Mean | Standard Deviation | F-value | Significance |
|---|---|---|---|---|---|---|---|
| | **Table 12: Differences in Principal Perceptions by School Level (Elementary, Middle and High)** | | | | | | |
| 1 | Redesigning my school in order to increase my school's effectiveness | Elementary | 52 | 1.94 | .938 | 4.491 | **.014*** |
| | | Middle | 25 | 1.96 | .790 | | |
| | | High | 25 | 2.56 | .870 | | |
| 4 | Providing core reading knowledge to elementary teachers who did not get this training in college | Elementary | 52 | 1.42 | .605 | 3.244 | **.043*** |
| | | Middle | 25 | 1.40 | .500 | | |
| | | High | 25 | 1.80 | .866 | | |
| 5 | Preparing for sudden increases in my student population as my school's effectiveness increases | Elementary | 52 | 2.13 | .841 | 4.358 | **.015*** |
| | | Middle | 25 | 2.28 | .843 | | |
| | | High | 25 | 2.72 | .737 | | |
| 10 | Raising the achievement levels of students with disabilities | Elementary | 52 | 1.42 | .499 | 4.196 | **.018*** |
| | | Middle | 25 | 1.12 | .332 | | |
| | | High | 25 | 1.24 | .436 | | |
| 11 | Understanding data-driven decision making | Elementary | 52 | 1.73 | .660 | 3.154 | **.047*** |
| | | Middle | 25 | 1.44 | .651 | | |
| | | High | 25 | 1.92 | .759 | | |
| | | Middle | 25 | 1.32 | .557 | | |
| | | High | 25 | 1.40 | .500 | | |
| 20 | Visualizing the future of my specific learning community while meeting the adjustment needs of my community | Elementary | 52 | 1.96 | .791 | 4.193 | **.018*** |
| | | Middle | 25 | 1.56 | .583 | | |
| | | High | 25 | 2.12 | .666 | | |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of $\leq 0.05$ | | | | | | | |

In order to determine where differences occurred between groups, a post-hoc Scheffe test was utilized. The data is presented in Table 13.

As revealed in Table 13, differences were found among the desirability levels:

1 - Redesigning my school in order to increase my school's effectiveness.

Differences existed between principals at the elementary and high school levels with a significance found at the p = .020 level. Principals at the elementary level indicated a stronger desirability for professional development training in this area than did principals at the high

school level.  There was no significance between elementary and middle school levels or middle and high school levels.

| Table 13: Post-Hoc Differences in Principal's Perceptions by School Level | | | | |
|---|---|---|---|---|
| | Statement | Comparisons by School Level | | Mean Difference | Sig. |
| 1 | Redesigning my school in order to increase my school's effectiveness | Elementary | Middle | -.018 | .997 |
| | | | High | -.618(*) | **.020*** |
| | | Middle | Elementary | .018 | .997 |
| | | | High | -.600 | .062 |
| | | High | Elementary | .618(*) | **.020*** |
| | | | Middle | .600 | .062 |
| 5 | Preparing for sudden increases in my student population as my school's effectiveness increases | Elementary | Middle | -.145 | .766 |
| | | | High | -.585(*) | **.016*** |
| | | Middle | Elementary | .145 | .766 |
| | | | High | -.440 | .169 |
| | | High | Elementary | .585(*) | **.016*** |
| | | | Middle | .440 | .169 |
| 10 | Raising the achievement levels of students with disabilities | Elementary | Middle | .303(*) | **.024*** |
| | | | High | .183 | .249 |
| | | Middle | Elementary | -.303(*) | **.024*** |
| | | | High | -.120 | .640 |
| | | High | Elementary | -.183 | .249 |
| | | | Middle | .120 | .640 |
| 11 | Understanding data-driven decision making | Elementary | Middle | .291 | .222 |
| | | | High | -.189 | .526 |
| | | Middle | Elementary | -.291 | .222 |
| | | | High | -.480 | **.050*** |
| | | High | Elementary | .189 | .526 |
| | | | Middle | .480 | **.050*** |
| 20 | Visualizing the future of my specific learning community while meeting the adjustment needs of my community | Elementary | Middle | .402 | .075 |
| | | | High | -.158 | .662 |
| | | Middle | Elementary | -.402 | .075 |
| | | | High | -.560(*) | **.025*** |
| | | High | Elementary | .158 | .662 |
| | | | Middle | .560(*) | **.025*** |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of ≤ 0.05 | | | | |

**4** - Providing core reading knowledge to novice teachers who did not get this training in college.

Post hoc testing showed no statistical significance.

**5** - Preparing for sudden increases in my student population as my school's effectiveness increases.

Differences existed between elementary and middle school levels with a significance found at the p = .016 level. Principals at the elementary school level indicated stronger desirability for professional development training in this area than at the high school level. There was no significant difference between elementary and middle or middle and high school level principals.

**10** - Raising the achievement levels of students with disabilities.

Differences existed between elementary and middle school levels with a significance found at the p = .024 level. Principals at the middle school level indicated stronger desirability for professional development training in this area than at the elementary school level. There was no significant difference between elementary and high or middle and high school level principals.

**11** - Understanding data-driven decision making

Differences existed between middle and high school levels with a significance found at the p = .50 level. Principals at the middle school level indicated stronger desirability for professional development training in this area than at the high school level. There was no significant difference between elementary and middle or elementary and high school level principals.

**20** - Visualizing the future of my specific learning community while meeting the adjustment needs of my community

Differences existed between middle and high school levels with a significance found at the p = .025 level. Principals at the middle school level indicated stronger desirability for professional development training in this area than at the high school level. There was no significant difference between elementary and middle or middle and high school level principals.

**Research Question 2.2**

Sub-question 2.2: Are differences in principals' desirability concerning professional development related to the level of experience as a principal?

In order to answer this question, an ANOVA was utilized. When differences among school levels were determined to be statistically significant, the post-hoc Scheffe test was

utilized to determine differences between the sub-groups. For the purpose of this study, principal experience was divided into four levels: Level 1 = 1-5 years, Level 2 = 6-10 years, Level 3 = 11-20 years and Level 4 = 20+ years.

| | | Years | N | Mean | Standard Dev | F value | Sig |
|---|---|---|---|---|---|---|---|
| **Table 14: Differences in Principal Perceptions by Experience Level (1-5 years, 6-10 years, 11-20 years, and 20+ years)** | | | | | | | |
| 4 | Providing core reading knowledge to novice teachers who did not get this training in college | 1-5 | 54 | 1.67 | .727 | 3.520 | **.018*** |
| | | 6-10 | 26 | 1.50 | .583 | | |
| | | 11-20 | 17 | 1.12 | .485 | | |
| | | 20+ | 5 | 1.20 | .447 | | |
| 7 | Raising the achievement levels of minority students | 1-5 | 54 | 1.78 | .904 | 2.785 | **.045*** |
| | | 6-10 | 26 | 1.46 | .706 | | |
| | | 11-20 | 17 | 1.18 | .529 | | |
| | | 20+ | 5 | 1.60 | .548 | | |
| 10 | Raising the achievement levels of students with disabilities | 1-5 | 54 | 1.41 | .496 | 3.694 | **.014*** |
| | | 6-10 | 26 | 1.15 | .368 | | |
| | | 11-20 | 17 | 1.12 | .332 | | |
| | | 20+ | 5 | 1.60 | .548 | | |
| 15 | Coaching and guiding teachers in the continual improvement of their educational knowledge and practice | 1-5 | 54 | 1.31 | .469 | 4.278 | **.007*** |
| | | 6-10 | 26 | 1.50 | .648 | | |
| | | 11-20 | 17 | 1.18 | .393 | | |
| | | 20+ | 5 | 2.00 | .000 | | |
| 19 | Engaging the school community in my school reform efforts | 1-5 | 54 | 1.76 | .699 | 4.829 | **.004*** |
| | | 6-10 | 26 | 1.96 | .720 | | |
| | | 11-20 | 17 | 1.41 | .507 | | |
| | | 20+ | 5 | 2.60 | .548 | | |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of $\leq 0.05$ | | | | | | | |

As indicated in Table 14, the analysis of variance revealed five factors that were statistically significant as a function of school level. Those factors were:

**4** - Providing core reading knowledge to novice teachers who did not get this training in college,
**7** - Raising the achievement level of students of minority,
**10** - Raising the achievement levels of students with disabilities, and
**15** Coaching and guiding teachers in the continual improvement of their educational knowledge and practice,
**19** - Engaging the school community in my school reform efforts.

In order to determine where differences occurred between groups, a post-hoc Scheffe test was utilized. The data is presented in Table 15.
As presented in Table 15, differences were found among the desirability levels:

**4** - Providing core reading knowledge to novice teachers who did not get this training in college.

Differences existed between principals with 1-5 years of experience and principals with 11-20 years of experience. This was significant at the .030 confidence level. Principals with 11-20 years of experience indicated a stronger desirability for professional development training in this area than did principals with 1-5 years of experience. There was no significance between the other levels of experience in principals.

**7** - Raising the achievement levels of minority students.
  Post hoc testing showed no statistical significance.
**10** - Raising the achievement level of students with disabilities.
  Post hoc testing showed no statistical significance.
**11** -  Understanding data-driven decision making.
  Post hoc testing showed no statistical significance.
**15** -  Coaching and guiding teachers in the continual improvement of their educational knowledge and practice.

Differences existed between principals with 1-5 years of experience and principals with 20+ years of experience. This was significant at the .041 confidence level. Principals with 1-5 years of experience indicated stronger desirability for professional development training in this area than did those principals with 20+ years of experience. Differences were also statistically significant between principals with 11-20 years of experience and principals with 20+ years of experience. This was significant at the .019 confidence level. Again, there was a stronger desirability indicated from principals with 11-20 years of experience than those principals with 20+ years of experience. There was no statistical significance between the other levels of experience in principals.

**19** -  Engaging the public in my school reform efforts.

Differences existed between principals with 11-20 years of experience and principals with 20+ years of experience. This was significant at the .009 confidence level. Principals with 11-20 years of experience indicated stronger desirability for professional development training in this area than did those principals with 20+ years of experience. There was no statistical significance between the other levels of experience in principals.

**Research Question 2.3**

Sub-question 2.3: Are differences in principals' desirability concerning professional development related to the percent of minority children from the student population?

In order to answer this question, an ANOVA was utilized. When differences among school levels were determined to be statistically significant, the post-hoc Scheffe test was utilized to determine differences between the sub-groups. For the purpose of this study, school minority populations were divided into four levels: Level 1 = 0-25%, Level 2 = 26-49%, Level 3 = 50-74%, and Level 4 = 75-100%.

| Table 15: Post-Hoc Differences in Principal's Perceptions by Experience Level | | | | |
|---|---|---|---|---|
| | | Comparisons by Years of Experience | | Mean Difference | Significance |
| 4 | Providing core reading knowledge to novice teachers who did not get this training in college | 1-5 | 6-10 | .167 | .762 |
| | | | 11-20 | .549(*) | **.030*** |
| | | | 20+ | .467 | .501 |
| | | 6-10 | 1-5 | -.167 | .762 |
| | | | 11-20 | .382 | .316 |
| | | | 20+ | .300 | .825 |
| | | 11-20 | 1-5 | -.549(*) | **.030*** |
| | | | 6-10 | -.382 | .316 |
| | | | 20+ | -.082 | .996 |
| | | 20+ | 1-5 | -.467 | .501 |
| | | | 6-10 | -.300 | .825 |
| | | | 11-20 | .082 | .996 |
| 15 | Coaching and guiding teachers in the continual improvement of their educational knowledge and practice | 1-5 | 6-10 | -.185 | .498 |
| | | | 11-20 | .138 | .805 |
| | | | 20+ | -.685(*) | **.041*** |
| | | 6-10 | 1-5 | .185 | .498 |
| | | | 11-20 | .324 | .239 |
| | | | 20+ | -.500 | .250 |
| | | 11-20 | 1-5 | -.138 | .805 |
| | | | 6-10 | -.324 | .239 |
| | | | 20+ | -.824(*) | **.019*** |
| | | 20+ | 1-5 | .685(*) | **.041*** |
| | | | 6-10 | .500 | .250 |
| | | | 11-20 | .824(*) | **.019*** |
| 19 | Engaging the school community in my school reform efforts | 1-5 | 6-10 | -.202 | .662 |
| | | | 11-20 | .347 | .331 |
| | | | 20+ | -.841 | .073 |
| | | 6-10 | 1-5 | .202 | .662 |
| | | | 11-20 | .550 | .082 |
| | | | 20+ | -.638 | .291 |
| | | 11-20 | 1-5 | -.347 | .331 |
| | | | 6-10 | -.550 | .082 |
| | | | 20+ | -1.188(*) | **.009*** |
| | | 20+ | 1-5 | .841 | .073 |
| | | | 6-10 | .638 | .291 |
| | | | 11-20 | 1.188(*) | **.009*** |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of < 0.05 | | | | |

**Table 16**
**Differences in Principal Perceptions by Percent of Minority Children from Total School's Population**
**(0-25%, 26-49%, 50-74%, and 75-100%)**

|  |  | % Population | N | Mean | Standard Deviation | F value | Significance |
|---|---|---|---|---|---|---|---|
| 7 | Raising the achievement levels of minority students | 0-25 | 75 | 1.73 | .859 | 3.440 | **.020\*** |
|  |  | 26-49 | 19 | 1.26 | .562 |  |  |
|  |  | 50-74 | 7 | 1.00 | .000 |  |  |
| 10 | Raising the achievement levels of students with disabilities | 0-25 | 75 | 1.36 | .483 | 2.708 | **.049\*** |
|  |  | 26-49 | 19 | 1.11 | .315 |  |  |
|  |  | 50-74 | 7 | 1.14 | .378 |  |  |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of $\leq 0.05$ | | | | | | | |

Post-hoc tests were not performed for raising minority and raising disability because at least one group had too few cases.

**Research Question 2.4**

Sub-question 2.4: Are differences in principals' desirability concerning professional development related to the percent of children with IEPs from the student population?

In order to answer this question, an analysis of variance (ANOVA) was utilized. When differences among school levels were determined to be statistically significant, the post-hoc Scheffe test was utilized to determine differences between the sub-groups. For the purpose of this study, school IEP levels were divided into four levels: Level 1 = 0-25% years, Level 2 = 26-49% years, Level 3 = 50-74% years and Level 4 = 75-100% years.

**Table 17**
**Differences in Principal Perceptions by Percent of Children with IEPs from Total School's Population**
**(0-25%, 26-49%, 50-74%, and 75-100%)**

|  |  | % Population | N | Mean | Standard Deviation | F value | Significance |
|---|---|---|---|---|---|---|---|
| 11 | Understanding data-driven decision making | 0-25 | 91 | 1.74 | .697 | 2.897 | **.039\*** |
|  |  | 26-49 | 6 | 1.50 | .548 |  |  |
|  |  | 50-74 | 4 | 1.00 | .000 |  |  |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of $\leq 0.05$ | | | | | | | |

As observed in Table 17, the analysis of variance revealed only one statement which showed statistical significance:

**11** - Understanding data-driven decision making.

This statement showed statistical significance as a function of the percent of children with IEPs from the total school population. The Scheffe Post-hoc test could not be performed for 10 because at least one group had too few cases.

**Research Question 2.5**

Sub-question 2.5: Are differences in principals' desirability concerning professional development related to the percent of children with limited English proficiency from the student population?

In order to answer this question, an ANOVA was utilized. When differences among the percentage of children with limited English proficiency were determined to be statistically significant, the post-hoc Scheffe test was utilized to determine differences between the sub-groups. For the purpose of this study, the limited English proficiency student population was divided into four levels: Level 1 = 0-25%, Level 2 = 26-49%, Level 3 = 50-74%, and Level 4 = 75-100%.

| | | % Limited English | N | Mean | Standard Deviation | F | Significance |
|---|---|---|---|---|---|---|---|
| **Table 18**<br>**Differences in Principal Perceptions by Percent of Children with Limited English Proficiency**<br>**from Total School's Population (0-25%, 26-49%, 50-74%, and 75-100%)** | | | | | | | |
| 3 | Ensuring that my teachers are trained in research-based instructional methods | 0-25 | 96 | 1.24 | .453 | 4.513 | **.036\*** |
| | | 26-49 | 6 | 1.67 | .816 | | |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of $\leq 0.05$ | | | | | | | |

As observed in Table 18, the analysis of variance revealed that the following statement had statistical significance:

**3** - Ensuring that my teachers are trained in research-based instructional methods.

This statement was statistically significant as a function of the percent of children with limited English proficiency from the total school population. The Scheffe Post-hoc test could not be performed for 3 because at least one group had fewer than two cases.

## Research Question 2.6

Sub-question 2.6: Are differences in principals' desirability concerning professional development related to the percentage of impoverished children from the student population?

In order to answer this question, an analysis of variance (ANOVA) was utilized. When differences among the percentage of impoverished children were determined to be statistically significant, the post-hoc Scheffe test was utilized to determine differences between the sub-groups. For the purpose of this study, the percentage of impoverished children were divided into four levels: Level 1 = 0-25%, Level 2 = 26-49%, Level 3 = 50-74%, and Level 4 = 75-100%.

As presented in Table 19, the analysis of variance revealed four factors which were found to be statistically significant as a function of the percent of impoverished children from the total school's population. Those factors were:

**1** - Redesigning my school in order to increase my school's effectiveness,
**7** - Raising the achievement levels of minority students,
**9** - Raising the achievement levels of new English learners,
**10** - Raising the achievement levels of students with disabilities.

| | | % Impoverished children | N | Mean | Standard Deviation | F value | Significance |
|---|---|---|---|---|---|---|---|
| **Table 19** <br> **Differences in Principal Perceptions by Percent of Impoverished children from** <br> **Total School's Population (0-25%, 26-49%, 50-74%, and 75-100%)** | | | | | | | |
| 1 | Redesigning my school in order to increase my school's effectiveness | 0-25 | 41 | 2.17 | .771 | 4.314 | **.007*** |
| | | 26-49 | 37 | 2.27 | .902 | | |
| | | 50-74 | 17 | 2.00 | 1.173 | | |
| | | 75-100 | 7 | 1.00 | .000 | | |
| 7 | Raising the achievement levels of minority students | 0-25 | 41 | 1.46 | .636 | 7.796 | **.000*** |
| | | 26-49 | 37 | 1.59 | .896 | | |
| | | 50-74 | 17 | 1.35 | .702 | | |
| | | 75-100 | 7 | 2.86 | .378 | | |
| 10 | Raising the achievement levels of students with disabilities | 0-25 | 41 | 1.39 | .494 | 6.879 | **.000*** |
| | | 26-49 | 37 | 1.22 | .417 | | |
| | | 50-74 | 17 | 1.06 | .243 | | |
| | | 75-100 | 7 | 1.86 | .378 | | |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of < 0.05 | | | | | | | |

In order to determine where differences occurred between groups, a post-hoc Scheffe test was utilized. The data is presented in Table 20.

As revealed in Table 20, differences were found among the following desirability levels:

**1** - Redesigning my school in order to increase my school's effectiveness.

Differences existed between groups reporting between 0-25% impoverished children and 75-100% impoverished children. This was significant at the .017 confidence level. Principals from schools with 75-100% impoverished children indicated a significantly stronger desirability for professional development training in statement 1 than principals with 0-25% impoverished children. Additionally, differences were attributed to groups reporting between 26-49% impoverished children and 75-100% impoverished children. This was significant at the .008 confidence level. Principals from schools with 75-100% impoverished children again showed stronger desirability than principals with 26-49% impoverished children. There was no statistical significance between the other levels of schools.

**7** - Raising the achievement levels of minority students.

Differences existed between groups reporting 75-100% impoverished children and every other impoverished children population level. Statistical significance was found between 75-100% impoverished children and 0-25% impoverished children at the .000 confidence level. Statistical significance was found between 75-100% impoverished children and 26-49% impoverished children at the .001 confidence level. Statistical significance was found between 75-100% impoverished children and 50-74% impoverished children at the .000 confidence level. Consistently, principals from schools with 75-100% impoverished children indicated a lower desirability for professional development training.

**9** - Raising the achievement levels of new English learners.

Differences existed between groups reporting populations composed of 75-100% impoverished children and those reporting populations composed of 0-25% impoverished children. Statistical significance was found at the .029 confidence level. Principals from schools with 0-25% impoverished children indicated a stronger desirability for professional development to raise the achievement levels of new English learners than the other poverty population levels. There was no statistical significance between the other levels of schools.

**10** - Raising the achievement levels of students with disabilities.

Differences existed between groups reporting populations composed of 75-100% impoverished children and those reporting populations composed of 26-49% impoverished children as well as those reporting a 50-74% impoverished population. Statistical significance was found at the .006 confidence level between 26-49% and 75-100%.

<table>
<thead>
<tr><th colspan="2" rowspan="2"></th><th colspan="2">Comparisons by<br>% Impoverished children</th><th>Mean Difference</th><th>Significance</th></tr>
<tr><th></th><th></th><th></th><th></th></tr>
</thead>
<tbody>
<tr><td colspan="6" align="center">**Table 20:**<br>**Post-Hoc Differences as a Function of the Percent of Impoverished children from the Total School's Population**</td></tr>
</tbody>
</table>

**Table 20:**
**Post-Hoc Differences as a Function of the Percent of Impoverished children from the Total School's Population**

| | | Comparisons by % Impoverished children | | Mean Difference | Significance |
|---|---|---|---|---|---|
| 1 | Redesigning my school to increase my school's effectiveness | 0-25 | 26-49 | -.100 | .969 |
| | | | 50-74 | .171 | .928 |
| | | | 75-100 | 1.171(*) | **.017*** |
| | | 26-49 | 0-25 | .100 | .969 |
| | | | 50-74 | .270 | .775 |
| | | | 75-100 | 1.270(*) | **.008*** |
| | | 50-74 | 0-25 | -.171 | .928 |
| | | | 26-49 | -.270 | .775 |
| | | | 75-100 | 1.000 | .098 |
| | | 75-100 | 0-25 | -1.171(*) | **.017*** |
| | | | 26-49 | -1.270(*) | **.008*** |
| | | | 50-74 | -1.000 | .098 |
| 7 | Raising the achievement levels of minority students | 0-25 | 26-49 | -.131 | .894 |
| | | | 50-74 | .110 | .966 |
| | | | 75-100 | -1.394(*) | **.000*** |
| | | 26-49 | 0-25 | .131 | .894 |
| | | | 50-74 | .242 | .744 |
| | | | 75-100 | -1.263(*) | **.001*** |
| | | 50-74 | 0-25 | -.110 | .966 |
| | | | 26-49 | -.242 | .744 |
| | | | 75-100 | -1.504(*) | **.000*** |
| | | 75-100 | 0-25 | 1.394(*) | **.000*** |
| | | | 26-49 | 1.263(*) | **.001*** |
| | | | 50-74 | 1.504(*) | **.000*** |
| 9 | Raising the achievement levels of new English learners (ESL) | 0-25 | 26-49 | -.290 | .604 |
| | | | 50-74 | -.023 | 1.000 |
| | | | 75-100 | -1.174(*) | **.029*** |
| | | 26-49 | 0-25 | .290 | .604 |
| | | | 50-74 | .267 | .815 |
| | | | 75-100 | -.884 | .163 |
| | | 50-74 | 0-25 | .023 | 1.000 |
| | | | 26-49 | -.267 | .815 |
| | | | 75-100 | -1.151 | .065 |
| | | 75-100 | 0-25 | 1.174(*) | **.029*** |
| | | | 26-49 | .884 | .163 |
| | | | 50-74 | 1.151 | .065 |
| 10 | Raising the achievement levels of students with disabilities | 0-25 | 26-49 | .174 | .361 |
| | | | 50-74 | .331 | .071 |
| | | | 75-100 | -.467 | .073 |
| | | 26-49 | 0-25 | -.174 | .361 |
| | | | 50-74 | .157 | .664 |
| | | | 75-100 | -.641(*) | **.006*** |
| | | 50-74 | 0-25 | -.331 | .071 |
| | | | 26-49 | -.157 | .664 |
| | | | 75-100 | -.798(*) | **.001*** |
| | | 75-100 | 0-25 | .467 | .073 |
| | | | 26-49 | .641(*) | **.006*** |
| | | | 50-74 | .798(*) | **.001*** |

**Note:** Those with a bold asterisk have statistical difference at the alpha of < 0.05

Statistical significance was found at the .001 confidence level between 50-74% and 75-100%. Principals from schools with 26-49% and 50-74% impoverished children indicated a stronger desirability than other impoverished population levels. There was no statistical significance between the other levels of schools.

## Research Question 2.7

Sub-question 2.7: Are differences in principals' desirability concerning professional development related to the school's current Title 1 Status?

In order to answer this question, an ANOVA was utilized. When differences among the percentage of children with limited English proficiency was determined to be statistically significant, the post-hoc Scheffe test was utilized to determine differences between the sub-groups. For the purpose of this study, Title 1 Status levels were divided into three levels: Level 1 - Schoolwide Title 1 funding, Level 2 - Title 1 funding, Level 3 - No Title 1 funding.

| | | Title 1 Funding | N | Mean | Standard Deviation | F value | Significance |
|---|---|---|---|---|---|---|---|
| | **Table 21**<br>**Differences in Principal Perceptions by Current Title 1 Funding Status**<br>**(Schoolwide Funding, Title 1 Funding, and No Title 1 Funding)** | | | | | | |
| 7 | Raising the achievement levels of minority students | Schoolwide | 17 | 1.47 | .624 | 2.988 | **.035*** |
| | | Title 1 | 34 | 1.91 | .866 | | |
| | | None | 48 | 1.40 | .792 | | |
| | | | | | | | |
| 12 | Guiding my learning community through the changes in attitude and behavior that high stakes accountability environment demands | Schoolwide | 17 | 1.24 | .437 | 5.507 | **.002*** |
| | | Title 1 | 34 | 1.88 | .478 | | |
| | | None | 48 | 1.60 | .610 | | |
| | | | | | | | |
| 15 | Coaching and guiding teachers in the continual improvement of their educational knowledge and practice | Schoolwide | 17 | 1.12 | .332 | 3.029 | **.033*** |
| | | Title 1 | 34 | 1.56 | .504 | | |
| | | None | 48 | 1.33 | .559 | | |
| 17 | Understanding and analyzing data in order to align assessment, standards, curriculum, and instruction | Schoolwide | 17 | 1.29 | .470 | 3.746 | **.014*** |
| | | Title 1 | 34 | 1.88 | .640 | | |
| | | None | 48 | 1.56 | .649 | | |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of < 0.05 | | | | | | | |

As observed in Table 21, the analysis of variance revealed four factors that were statistically significant as a function of Title 1 status. Those factors were:

7 - Raising the achievement levels of minority students,
12 - Guiding my learning community through the changes in attitude and behavior that high stakes accountability environment demands,
15 - Coaching and guiding teachers in the continual improvement of their educational knowledge and practice, and

17 - Understanding and analyzing data in order to align assessment, standards, curriculum, and instruction.

In order to determine where differences occurred between groups, a post-hoc Scheffe test was utilized. The data is presented in Table 22.

As revealed in Table 22, differences were found among the following desirability levels:

7 - Raising achievement levels of minority students.

Differences existed between groups receiving Title 1 funding and those receiving no Title 1 funding. Statistical significance was found at the .042 confidence level with principals that receive no funding indicating a stronger desirability for professional development training in this area. There was no statistical significance between the other funding levels.

| Table 22 Post-Hoc Differences as a Function of the School's Current Title 1 Funding Status | | | | |
|---|---|---|---|---|
| | | Comparisons by Title 1 Funding | | Mean Difference | Significance |
| 7 | Raising the achievement levels of minority students | Schoolwide | Title 1 | -.441 | .322 |
| | | | None | .075 | .990 |
| | | Title 1 | Schoolwide | .441 | .322 |
| | | | None | .516(*) | **.042*** |
| | | None | Schoolwide | -.075 | .990 |
| | | | Title 1 | -.516(*) | **.042*** |
| 12 | Guiding my learning community through the changes in attitude and behavior that high stakes accountability environment demands | Schoolwide | Title 1 | -.647(*) | **.002*** |
| | | | None | -.369 | .128 |
| | | Title 1 | Schoolwide | .647(*) | **.002*** |
| | | | None | .278 | .162 |
| | | None | Schoolwide | .369 | .128 |
| | | | Title 1 | -.278 | .162 |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of < 0.05 | | | | | |

12 – Guiding my learning community through the changes in attitude and behavior that high stakes accountability environment demands.

Statistical significance was found at the $p = .002$ level between principals receiving Schoolwide Title 1 funding and principals who receive only Title 1 funding. Principals from schools receiving Schoolwide Title 1 funding showed stronger desirability for professional development training than schools only receiving funding. There was no statistical significance between the other funding levels.

## Research Question 2.8

Sub-question 2.8: Are differences in principals' desirability concerning professional development related to the school's current status in meeting AYP?

In order to answer this question, an ANOVA was utilized. When differences among the percentage of children with limited English proficiency was determined to be statistically significant, the post-hoc Scheffe test was utilized to determine differences between the sub-groups. For the purpose of this study, Title 1 Status levels were divided into four levels: Level 1 - Fully Accredited, Level 2 - Accredited with Warning, Level 3 - Accreditation Denied, and Level 4 - Conditionally Accredited.

| | | Accreditation Status | N | Mean | Standard Deviation | F value | Significance |
|---|---|---|---|---|---|---|---|
| | **Table 23: Differences in Principal Perceptions by Current Accreditation Status** | | | | | | |
| 16 | Understanding the foundations of effective special education | Full | 88 | 1.55 | .585 | 2.917 | **.038*** |
| | | Warning | 10 | 1.10 | .316 | | |
| | | Denied | 2 | 1.00 | .000 | | |
| | | Conditional | 2 | 1.00 | .000 | | |
| 20 | Visualizing the future of my specific learning community while meeting the adjustment needs of my community | Full | 88 | 1.98 | .742 | 2.331 | .079 |
| | | Warning | 10 | 1.40 | .516 | | |
| | | Denied | 2 | 1.50 | .707 | | |
| | | Conditional | 2 | 1.50 | .707 | | |
| **Note:** Those with a bold asterisk have statistical difference at the alpha of < 0.05 | | | | | | | |

As observed in Table 23, the analysis of variance revealed the following as statistically significant:

10 - Raising the achievement levels of students with disabilities.

In order to determine where differences occurred between groups, a post-hoc Scheffe test was utilized. There was no statistical significance within groups for current accreditation status. This means that differences could not be attributed to groups based on a pair-wise comparison. The relationships between the levels of the variables is too complex to be analyzed by the Scheffe test.

**Research Question 3**

How do principals rank their desirability for professional development as it relates to meeting the high stakes accountability of No Child Left Behind Act?

Each of the twenty desirability statements were rank–ordered from the highest mean desirability preference to lowest mean desirability preference. Those statements rated with the highest desirability concerned principal desirability to raise the achievement scores of students with disabilities and students living in poverty, as well as principal desirability to ensure that teachers are trained in research-based curriculum.

| Rank Order | Statement Number | Statement | Mean |
|---|---|---|---|
| **Table 26: Rank-ordered by principals' top ten statements of desirability** | | | |
| 1st | 10 | Raising the achievement levels of students with disabilities | 5.72 |
| 2nd | 3 | Ensuring that my teachers are trained in research-based instructional methods | 5.55 |
| 3rd | 8 | Raising the achievement levels of students living in poverty | 4.86 |
| 4th | 7 | Raising the achievement levels of minority students | 4.06 |
| 5th | 14 | Knowing what constitutes good instructional practice | 3.36 |
| 6th | 15 | Coaching and guiding teachers in the continual improvement of their educational knowledge and practice | 3.35 |
| 7th | 2 | Implementing research-based curricula | 2.87 |
| 8th | 4 | Providing core reading knowledge to novice teachers who did not get this training in college | 2.77 |
| | 16 | Understanding the foundations of effective special education | 2.77 |
| 9th | 13 | Designing curriculum that meets the learning needs of all students and is aligned with state and local standards | 2.67 |
| 10th | 11 | Understanding data-driven decision making | 2.51 |

## DISCUSSION AND CONCLUSION

As previously discussed, principals today are held accountable for ensuring that all groups of students – economically disadvantaged, racial or ethnic minorities, students with disabilities, and English language learners – make state-defined "annual yearly progress" targets (Anthes, 2002). However, according to Thune (1997), principals are being forced to operate educational programs under a growing number of federal and state mandates with limited knowledge and available resources.

This study's primary purpose was to investigate the perceptions of Virginia principals regarding their desirability for professional development as it relates to the high stakes accountability. This study revealed important information about principals' professional development desires for training in order to better meet current federal and state accountability mandates. In fourteen of the twenty statements of desirability, principals indicated some level of desirability toward professional development training. Overall, the principals clearly assessed their desirability for professional development training to be moderate to high.

**Professional Development Preferences**

The three statements in which principals had the greatest desire for training both in Section A (rating of desirability) and Section C (ranking of desirability) were: #3 - Ensuring that my teachers are trained in research-based instructional methods, #10 - Raising the achievement levels of students with disabilities, and #8 - Raising the achievement levels of students living in poverty. The fact that these three categories matched in both rating of desirability and ranking of desirability for professional development clearly shows that these three topics are essential components in any principal professional development program.

That principals desire more professional development in such categories is not surprising. The growing focus on testing requires that principals have teachers within their buildings who are trained in research-based instructional methods. The NCLB Act recognizes the use of proven, research-based instructional methods as one factor which makes a difference in providing children with a quality education, for, as the Act states, "Teachers must be equipped with the most current, research-based instructional tools to help them do their job" (U.S. Department of Education, 2007). A primary focus of this law is the requirement that school districts and individual schools use effective research-based remediation programs (Wright & Wright, 2007). This is consistent with the findings of this study, in which 77% of Virginia principals responded with a strong desirability for professional development in ensuring that teachers are trained in research-based curricula. Consequently, Virginia school leaders who hire inadequately prepared teachers must be ready to provide in-service professional development targeted for specific research-based curricula, instructional methods, and programs.

The Institute for Educational Leadership (2000) includes working with teachers to strengthen their teaching skills as being a crucial role principals can play in improving teaching and learning. Principals must understand the instructional programs of their school divisions well enough to effectively guide teachers. Awareness of the school and teacher practices that impact student achievement is critical, but without effective leadership, there is less of a possibility that schools and districts will address these variables in a coherent and meaningful way (Miller, 2003).

Raising the achievement levels of students living in poverty is notably an area of strong desirability for professional development for Virginia principals in this study. According to

Secretary Margaret Spellings of the U.S. Department of Education (2007), "We must reward teachers and principals who make the greatest progress in improving student performance and closing the achievement gap. This is especially important in high-poverty schools, where students are less likely to be taught by a credentialed teacher" (p. 8). In this study, principals responded with the same type of desirability for increasing student performance for children in poverty as Secretary Margaret Spellings. Gerstl-Pepin (2006) stated, "An equal society begins with equally excellent schools, but we know our schools today are not equal" (p. 143). Poverty is considered to be an important factor in school failure (Rothstein, 2004). Principals in this survey rank-ordered raising the achievement levels of students living in poverty as the third highest professional development priority. Additionally, 78% of Virginia principals surveyed noted a strong desirability for professional development in raising achievement levels of students living in poverty, which supports the assertion that principals understand the significance of this NCLB subgroup of students. The principal must investigate how economic inequities might be hindering student success and shaping their students' lives (Gerstl-Pepin, 2006). Therefore, professional development workshops on the culture of poverty must be provided to assist principals in increasing student success in spite of such economic imbalance. As one teacher noted after participating in workshops on poverty, "It helped me realize that our school was operating through a middle-class lens and that our kids didn't necessarily recognize that lens" (Gerstl-Pepin, 2006, p. 151).

Raising the achievement levels of students with disabilities was noted by 71% of the principals surveyed as being an area of importance for professional development. Additionally, raising the achievement levels of students with disabilities was rank-ordered as having the highest level of desirability for professional development. Such findings from the survey are consistent with the fact that "across the country, students with disabilities have made progress on state assessment, however, many schools are not making Adequate Yearly Progress (AYP) because of the overall academic performance of the special education subgroup measured against the set standard established by each state for all of its students" (Cole, 2006, p. 1).

While the expectation of any building level principal is that the building leader must be ready to face the daily challenges specific to special education programming, the principal is not equally expected to receive ongoing training and preparation in special education and knowledge in order to meet this requirement. Thus, there is a basic lack of training which predicates a lack of continued professional development in this area.

Thune (1997) states that it is critical for a school system to employ principals who have a basic knowledge and understanding of special education in order to meet the federal and state audits for special education. McLaughlin and Nolet (2004) note that it is critical for a building principal to act as a school leader by creating effective special education services for students. Every school principal need to understand the foundations of effective special education in today's climate of high standards and high stakes accountability.

Since current mandates assure that the programs and services for children with disabilities are in absolute compliance with the law, building principals absolutely must be knowledgeable and prepared to supervise the array of special education services within their schools and to make decisions regarding best practices. Students with disabilities now have access to the same curriculum and high standards as all students. With such access comes the responsibility by principals to ensure that students with disabilities continue to experience an increase in achievement levels.

While principals suggested strong desirability for professional development in the above noted areas, the desirability statements that principals least desired are equally interesting. When principals were asked to rank twenty desirability statements, they rated visualizing the future of their specific learning community while meeting the adjustment needs of their community, redesigning their school in order to increase their school's effectiveness, and preparing for sudden increases in student population as their schools' effectiveness increases as being the least desirable fields for professional development. As all three statements speak to professional learning communities, the fact that principals ranked these as having little desirability is noteworthy. Interestingly, DuFour (2001) contended that while educators are not typically against creating a professional learning community, they may not know where to begin given all the demands on them. He contended that to create a professional learning community, tone must focus on learning rather than teaching (2004), yet this is in direct conflict with NCLB which places its thrust of impact on ensuring that teachers meet "highly qualified" standards in the content areas they are assigned to teach. Teachers are responsible for the gains made by their students and must focus their efforts on perfecting their teaching skills. Professional learning communities require that every professional within the school must work with their colleagues to ensure that students learn, to achieve a culture of collaboration, and to judge their effectiveness on the basis of student achievement results (DuFour, 2004). There is solid research to support that the concepts found within professional learning communities should drive school districts today (DuFour, 2003). Professional learning communities have been shown to have positive influence on student achievement (Dufour, 2001). The results from this study support further investigation into why principals noted such non-desirability for professional development in this area.

## PROFESSIONAL DEVELOPMENT DIFFERENCES

Professional desirability differences were found among principals based on their experience levels. Overall, principals with 11-20 years of experience demonstrated a stronger desire for professional development than less veteran principals or principals having 20+ years of experience. Interestingly enough, research often tends to focus on the novice principal rather than the veteran principal as needing professional development. In fact, research often supports a more veteran principal, such as those principals having 11-20 years of building experience,

serving as mentor principals and offering to mold prospective principals (Fleck, 2008). However, consistent with these findings are current accountability demands, which challenge principals to succeed and sustain longevity in their positions(Fleck, 2008), and principals beyond the beginner phase still demonstrate a desirability for professional development. Hence, every Virginia school district should remain committed to continued professional growth opportunities for principals at all experience levels.

Professional desirability differences were found by principals based on their percentages of impoverished children within their total school population. Principals reporting groups of 75-100% impoverished children reflected a stronger desirability for professional development in order to redesign their schools to increase their schools' effectiveness, raising the achievement levels of students with English as second language, and raising the achievement levels of students with disabilities. This supports the assertion made by Brooks (2004) that economic factors are critical to understanding achievement inequalities. Although the public system alone is often held responsible for achievement gaps between children living in poverty and children from affluent families (Gerstl-Pepin, 2006), these findings support that principals are looking at "the bigger picture" to acknowledge this group of children and focus on professional development that will support them in closing such achievement gaps. School districts should focus on professional development for principals which will enhance understanding of economic inequities and their impact to student achievement.

Professional desirability differences were found between principals receiving Title 1 funding and those principals either receiving Schoolwide Title 1 funding or not receiving Title 1 funding at all. Title 1 funding influences principal desirability for professional development because funding is a significant issue when addressing local responsibility under NCLB and the subsequently ever-increasing demands placed on schools. A 2006 report from the Center on Education Policy (American Teacher, 2006) warned that for schools struggling to meet higher AYP targets, "funds provided by NCLB to help…are often simply not there" (p. 6). In order for principals to be able to meet ongoing and increasing accountability demands, Congress must look at funding bills which will stabilize the underfunding and cuts in funding of Title 1 funds.

## IMPLICATIONS FOR PRACTICE

Even though desirability statements were rank-ordered based on their mean, a comparison of the means was conducted to determine clusters of relative importance. Six clusters were identified and should provide practical significance when leaders consider implementing desirability preferences into professional development practices. Practically speaking, when considering professional development, the first three desirability statements were found to have equal importance. Hence, principals' greatest levels of desirability reveal that professional development should focus on the following cluster of professional topics, rather than just the highest rank-ordered statement of desirability: Ensuring that teachers are trained in

research-based instructional methods, raising the achievement levels of students with disabilities, and raising the achievement levels of students living in poverty.

This has implications for school divisions and professional organizations when determining funding for professional development workshops. Practically speaking, rather than funding professional development for one single area of desirability, funding should be offered to the highest ranked cluster of principal desirability for professional development. Additionally, this study suggests that whenever possible, teachers should be trained in research-based instructional methods, professional development workshops on poverty should be provided to assist principals in increasing student success in spite of economic imbalance, educational leaders should examine current research-based instructional methods and content taught at the college level to determine if college course requirements should increase or incorporate a stronger emphasis specific to research-based instructional methods, and that educational leaders should ensure that professional development training programs for principals are designed and available which focus on raising the achievement levels of students with disabilities and minority students.

Further research might be considered to determine if differences in principals' desirability for professional development training exist based on the school's level of funding received for professional development training, the professional development training principals receive within their district, the perceived support principals receive from Central Office Administration, or principals' demographic location (e.g. urban, suburban, rural). Furthermore, does the principals' previous training, experiences, or level of education influence their desirability for professional development training? What other factors might principals suggest as having a strong influence on student academic achievement? What other factors might principals suggest as having a strong desirability for professional development training? Finally, future research might consider why statistically significant differences in principals' desirability exist as related to their school level, years of experience, percentage of impoverished children in the total school population, and current Title 1 status.

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# EMPIRICAL EVIDENCE OF THE FAIRNESS AND QUALITY OF PEER EVALUATIONS

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## ABSTRACT

*This paper critically examines the use of peer evaluations in two semesters of a graduate level accounting class in a major American university. While numerous authors have written on the use of peer evaluations, few have tested the issues of fairness and quality of those evaluations. Testing peer evaluations of case presentations assigned in a competitively graded MBA course, two primary research questions are asked: 1) Are there groups of students who systematically act in their own self-interest in evaluating their peers? 2) Are there characteristics in student peer evaluations that would suggest qualitative shortcomings to those evaluations? Preliminary evidence suggests that, with some qualification, peer evaluations studied are not subject to a self-interest bias. Further, when tested across various variables representing student comprehension of the material, peer evaluations appear to be consistent in their conclusions.*

Keywords: peer evaluations, case method, fairness, quality, student presentations, group assessment

## INTRODUCTION

A challenge to academics has long been the fair and rigorous evaluation of the performance of students in classes, when such evaluation is called for (such as in most western European and American universities.) During the 1990s, due to a surge in international efforts directed toward making accounting education more participative (see, for example, AAA, 1986; AECC, 1990; Libby, 1991; Albrecht, *et al*., 1994; Lindquist, 1995; United Nations, 2003) pedagogical methods such as group work, case analysis, team projects, etc., have made evaluation of student performance more complex (Humphreys, et al. 1997).

Student peer evaluations offer a variety of benefits in supplementing the instructor's task of evaluating students. First, when working in groups, fellow students have a unique perspective from which to evaluate the relative contributions of group members. Greguras, et al. (2001) observed that proximity of peers in performance of tasks make them uniquely positioned to observe level and quality of peer performance.

Second, if asked to assume partial ownership of the education process, students should be more engaged in that process. Thus, if expected to submit peer evaluations, students should be

invested in paying attention to, being prepared for, and taking seriously work executed by their peers in order to compose a fair evaluation of their work.

An additional benefit to use of peer evaluations is their increasing use within firms (Greguras, et al. 2001.) Upon graduation, new employees often find themselves called upon to evaluate those with whom they work. Guidance provided to students in the formulation of evaluations of peers, as well as the experience of being evaluated by their peers while they are in school would invariably carry over into their ensuing professional lives.

Several problems associated with the use of peer evaluations present themselves, however. First, there exists the possibility of a prisoner's dilemma when students are asked to evaluate each other. (Numerous works exist describing the prisoner's dilemma. See, for example, Poundstone, 1992, pp. 8-9.) A prisoner's dilemma exists when two players (for example, two students) in the absence of collaboration, make independent decisions that lead to a suboptimal outcome for either player. In this case, assume for a moment a simple example of two students who are asked to evaluate one another. Each student can choose either to evaluate the other student fairly or unfairly (i.e., lower than deserved.) Each student, when facing his or her decision, will evaluate the alternatives in light of what the other student may choose. A "dominant strategy" exists whenever there is one alternative that is better in any case, no matter the choice made by the other player.

In a strictly competitive game (which, in a class using peer evaluations and a competitive grading model is almost certainly the case,) regardless of what another student does, and in the absence of signaling, a student's best option (dominant strategy) will always be to assign a lower evaluation to the work of his/her peer. Thus, a concern of this study is that students, acting in their own self interest, will systematically grade their peers lower in an effort to make their own evaluations relatively better.

A second potential problem is that students may not have the capacity to judge the work of their peers. Technical courses in particular (e.g., accounting courses) present an environment in which, prior to the completion of the educational cycle, the student is not yet equipped to judge technical competency of a complex solution. How, for example, can a student evaluate the correctness of a solution to a cash flow problem if the student has not yet mastered the preparation of a cash flow statement?

## COURSE ENVIRONMENT AND PEER EVALUATIONS

The course in which peer evaluations were implemented and examined was a four semester hour course covering introductory financial and managerial accounting offered at the graduate level for MBA students at a major, public American university. Observations of behaviour were made over two semesters and covered three sections of the course. The average enrollment was 35 students per section. Twenty-one Harvard Business School cases were used each semester, with students taking on team responsibilities in presenting the cases. In general,

teams of two students were assigned one case each, based on a bidding scheme that rewarded teams for taking on more difficult cases.

The case presentation counted for five percent of a student's grade, and was earned by the team, rather than by individuals separately.  Each student in the course, whether presenting or not, was expected to be thoroughly prepared for each case.  Preparedness was monitored through a series of quizzes that were administered frequently, but on a random basis.  Participation was observed and graded to provide additional incentives for case preparation among class members. A variety of benefits accrue from requiring student preparation and presentation of cases.  Adler et al. (2004) argued that self-directed learning that emerges in student presentation of cases is more consistent with learning objectives intended in the case method, by comparison to a teacher-led case pedagogy.  These include enhancement of communication skills, building of confidence, increased willingness to confront new experiences, promotion of self-directed learning, among others.

As the semester progressed, and cases were presented, students were asked to evaluate their peers on five dimensions (professionalism, technical quality, clarity and organization, identification of issues, and use of external resources), and on a scale of 0-5 on each of those dimensions.  The five dimensions were provided on an evaluation form to which the students responded following each presentation.  Evaluations were e-mailed to the professor, along with their assessment of degree of difficulty of the case.  Peer evaluations presented several challenges.  Students in the first semester were not given specific instructions with respect to timeliness of their evaluations nor the importance of actually completing them.  As a consequence, the response rate was only about 50%.  By comparison, in the second semester, when asked to provide their evaluations within two days of the presentation and told that their response rate may factor into their participation grade, response rate improved significantly, rising to over 80%.

Kilpatrick et al. (2001) identified several characteristics in peer evaluations that, according to students, are desirable.  These include a structured evaluation form, allowance for additional comments, and that evaluators remain confidential.  Each of these characteristics was incorporated into the peer evaluation process used in the courses observed in this study.

## RESEARCH QUESTIONS AND HYPOTHESES

Of significant concern is whether peer evaluations add or detract from a fair and impartial score.  In MBA classes under a quasi-cohort system, one would be naïve to expect that peer evaluations would be completely impartial.  One expects that both alliances and rivalries would develop over time – perhaps most obviously that friends would score friends highly; and, possibly, that rivalries or animosities may emerge among students, having the opposite effect.

There are also potential sources that arise from purely self-interested behaviour.  In its simplest form, a self-interested behaviour might manifest itself in the form of lower scores

assigned by students hoping to gain a competitive advantage over their colleagues. The grading mechanism in these classes was competitive, in the sense that grades were assigned based on performance relative to that of one's peers. Under that circumstance, and if one recognizes the opportunity, assigning low peer evaluations can secure a competitive advantage over those who evaluate their peers fairly. In response to this concern, the research question the study asks is:

> *R1:* *Are there groups of students who systematically act in their own self-interest in evaluating their peers?*

A logical extension of this question is whether students who exhibit lower levels of moral development are more likely to use a peer evaluation system to put themselves at a systematic advantage to their classmates. To answer this question, the Defining Issues Test (DIT) was administered to each student in an effort to quantify various dimensions of the student's moral reasoning. The most recent version of the DIT, the DIT-2, provides several measures that help identify progressively higher levels of moral reasoning. The N2SCORE is a developmental index that attempts to measure levels of sophistication in thinking about moral issues (Bebeau and Thoma, 2003, pp. 19-20). While it does not necessarily follow that more sophisticated thinking (and rejection of "simpler and biased" thinking) will produce ethical behavior, that there would be a systemic bias toward more moral behavior in the case of higher level thought does. Thus, the first hypothesis tested by this study is:

> *H1$_1$:* *Mean evaluations by students with a higher N2SCORE are higher than mean evaluations by students with a lower N2SCORE.*

As results are discussed, whether the null is rejected or not, and its interpretation as a desirable outcome, or an undesirable one, will vary depending on the nature of the question. In this case, the regression results (Table 1) do not support rejection of the null, suggesting that there is not a systematic, self-interested behaviour exhibited during the peer evaluation process by students with a lower N2SCORE. Further, students with a higher N2SCORE (i.e., higher measured levels of moral development) are not at a systemic disadvantage to those with lower scores.

| Table 1.  Average Evaluation = *f*(N2SCORE) | | | | | |
|---|---|---|---|---|---|
| R-square 0.0205  Root MSE  0.3898 | | | Adj R-square 0.0108 | C.V. 8.6966 | |
| Source | DF | SS | MS | F | Pr > F |
| Model | 1 | 0.321 | 0.321 | 2.110 | 0.1494 |
| Error | 101 | 15.34 | 0.152 | | |
| Total | 102 | 15.67 | | | |

Another interesting question is whether students who are doing poorly in the course either consciously or subconsciously lower their evaluations to gain competitive advantage in an effort to improve their standing in the class. Two testable hypotheses were developed to address this question. They are:

H1$_2$:     Change in mean evaluations by students from the first to the second half of the course is inversely related to their scores on the midterm exam.

H1$_3$:     Student scores on the midterm exam are positively related to their mean evaluations in the second half of the course.

In the case of *H1$_2$*, upon receiving their score on the midterm exam, a student who has performed poorly may seek to obtain any competitive advantage they might be able to find. One possible source would be for that student to lower their peer evaluations for the duration of the semester. Since students are informed that grading is competitive in the course, this behaviour would represent a dominant strategy if their goal is to raise their relative position in the class.

In much the same way, the population of students performing well on the midterm should be more confident (i.e. less insecure) about their grade and feel less pressure to lower their scores. In *H1$_3$*, mean peer evaluations prior to the midterm exam are assumed to be equivalent. This assumption was supported by an analysis of the data.

Results of the statistical tests of these hypotheses are presented are presented below (Tables 2 and 3.) Again, in neither instance are these assertions supported; and, once again, this should be interpreted as a desirable outcome. Of course, there can be several explanations of why students appear to behave in a way true to the task of evaluating their peers fairly. The most optimistic interpretation is that students are behaving responsibly toward their peers, judging their work fairly, and acting in an altruistically consistent way with Kant's first categorical imperative (Beck, 1990, p. 38). It is also possible that students do not realize the marginal advantage to be gained by lowering their peer evaluations; or, that they do understand, but consider the probabilistic benefit to be so low that they do not wish to risk that their peers might discover the source of their low evaluations. In any event, there appears to be no evidence of gaming taking place in the peer process.

| Table 2. Change in Evaluation = *f*(Midterm Exam) | | | | | |
|---|---|---|---|---|---|
| R-square 0.0014 | Root MSE 0.2582 | | Adj R-square -.0107 | C.V. | -276 |
| Source | DF | SS | MS | F | Pr > F |
| Model | 1 | 0.008 | 0.008 | 0.118 | 0.732 |
| Error | 82 | 5.467 | 0.067 | | |
| Total | 83 | 5.475 | | | |

| Table 3.  Second Half Mean Evaluations = ƒ (Midterm Exam) | | | | | |
|---|---|---|---|---|---|
| R-square | 0.008      Root MSE    0.386 | | Adj R-square | -.0012 | C.V.    8.572 |
| Source | DF | SS | MS | F | Pr > F |
| Model | 1 | 0.129 | 0.129 | 0.869 | 0.353 |
| Error | 109 | 16.21 | 0.149 | | |
| Total | 110 | 16.34 | | | |

Another interesting question posed here is whether there is evidence that the peer evaluation system has characteristics that diminish the quality of the assessment.  Although Kilpatrick et al. (2001) presented evidence that students favor student input into the evaluation process, there may be problems associated with the content of those evaluations.  The research question suggested here is:

> R2:     Are there characteristics in student peer evaluations that would suggest qualitative shortcomings to those evaluations?

A variety of ways exist to approach answering this question.  One interesting observation, for example, is the proportion of students who appeared to give uniform evaluations, offering very little discrimination among case presentations.  Several examples illustrate this point.  In one student presentation of Crystal Meadows of Tahoe, Inc. (HBS Case 192-150) requiring preparation of a cash flow statement, an income statement was presented instead.  Because the error was so egregious, control of the presentation was temporarily assumed by the professor in order to correct any impression that the income statement might be a cash flow statement.  Still, in the evaluations, under technical merit, several students assigned "5", when a major technical flaw had been assertively pointed out.  In several presentations, students would dress in shorts, wear t-shirts or otherwise dress unprofessionally.  Groups also often suggested a lack of preparedness.  Alternatively, other groups were dressed in business suits and had smoothly delivered, professional presentations.  Still, a critical mass of students failed to discriminate between these two levels of apparent effort, assigning "5" in each instance to the "conducted in a professional manner" dimension.  While this study did not attempt to measure these more subjective qualities, they exist as evidence that perhaps the marginal efforts made by some students were not rewarded in the peer evaluation process.

Another concern is that students who came to class unprepared may not have had a basis upon which to evaluate certain dimensions of the presentation.  Question 2 on the evaluation form asked the reviewer to evaluate the presentation on its technical merits.  Absent knowledge of the case and insight into viable solutions, a student may have given the presenter the benefit of the doubt and submitted a high evaluation.  During both semesters, short quizzes were administered at the beginning of class periods, at random.  These quizzes were used as a proxy

for student preparedness, and were part of the grading mechanism serving that purpose. The hypothesis thus suggested is:

> *H2₁:* *Students performing poorly on daily quizzes submitted higher evaluations of technical merit for cases than students performing well on daily quizzes.*

By a similar logic, students who performed well, and by extension are presumed to have been prepared each day, should have had more consistent insights into the technical merit of a presentation. The scores by those students, therefore, should be more narrowly distributed than scores assigned by students who were less well prepared.

Regarding workload, preparing for an easier case will take less of a commitment on the part of students not assigned to present. With more difficult cases, one might expect that fewer students will have prepared for that case, and thus would be less informed in evaluating their peers whose responsibility it was to present. In those cases, too, one might expect that evaluations would be more widely dispersed than when the case assigned was less difficult. Based on these arguments, the following hypothesis was developed:

> *H2₂:* *Dispersion of evaluations of technical merit by students is inversely related to scores on the midterm exam.*

Tables 4 and 5 provide the statistical results for the preceding two hypotheses. The results suggest no evidence that potential problems implied by either hypothesis exist. Again, failure to reject the null is a desirable outcome in each instance, indicating that lack of preparedness did not interfere with assessments when compared to those students who were more prepared.

| Table 4. Average Technical Evaluation = f (Quiz Average) | | | | |
|---|---|---|---|---|
| R-square 0.0054 Root MSE 0.3861 | | Adj R-square -.0038 | | C.V. 8.583 |
| Source | DF | SS | MS | F | Pr > F |
| Model | 1 | 0.088 | 0.088 | 0.588 | 0.4447 |
| Error | 109 | 16.25 | 0.149 | | |
| Total | 110 | 16.34 | | | |

| Table 5. Dispersion of Scores of Technical Merit = *f*(Midterm Exam) | | | | |
|---|---|---|---|---|
| R-square 0.0146 Root MSE 0.2481 | | Adj R-square 0.0051 | | C.V. 53.543 |
| Source | DF | SS | MS | F | Pr > F |
| Model | 1 | 0.094 | 0.094 | 1.530 | 0.2189 |
| Error | 103 | 6.342 | 0.062 | | |
| Total | 104 | 6.436 | | | |

An interesting possibility is the "halo" effect that may accompany the presentation of more difficult cases. Anyone familiar with judging of diving understands this effect. Presumably, easier dives should be easier to execute and thus be accompanied by better scores. More difficult dives, however, seem to be those that will draw the 9s and 9.5s from the judges, while the easier dives will tend not to be scored as well. There thus seems to be a subconscious awarding of additional credit for attempting the more difficult dives, even though the degree of difficulty system is intended to compensate automatically for this (Thomas et al, 2005, p. 208). In the same way, one expects that students executing easier cases should receive higher scores for their presentation. If the opposite were true, as seems to be the case in diving scores, rewards for cases would be distributed in a way other than intended. The following hypothesis, therefore, tests this notion:

*H2₃:     Unadjusted peer evaluations of cases are positively related to their degree of difficulty.*

Results (Table 6) suggest a strong statistical relationship between unadjusted peer evaluations and case difficulty, suggesting the aforementioned "halo" effect. The coefficient is positive, consistent with the hypothesized direction of the relationship. If there is solace to be found in this result, one might find it in two places. First, the adjusted R-square is only 0.0567. That suggests that there are other, more important variables that would help explain better the variance among subjects. Second, this may be a "problem" that is acceptable. Students are taking on a risk and additional work by bidding aggressively on more difficult cases. The effect discussed here is simply a hidden reward associated with the extra risk taken on by those individuals.

| Table 6.  Unadjusted Peer Evaluations = $f$(Case Difficulty) | | | | | |
|---|---|---|---|---|---|
| | R-square | 0.0652 | Adj R-square | 0.0567 | |
| Source | DF | SS | MS | F | Pr > F |
| Model | 1 | 0.356 | 0.356 | 7.737 | 0.006 |
| Error | 111 | 5.109 | 0.046 | | |
| Total | 112 | 5.465 | | | |

Another indication of uninformed evaluations may be inconsistencies in distribution of evaluations on days when multiple cases were presented. When one case is assigned for a given day, the task of preparing adequately is more manageable than on days when multiple cases are assigned. Also true, perhaps, is that if evaluations of grouped cases are more widely distributed, a case could be made that students, in formulating their evaluations, are less focused because of the additional inputs. The fourth hypothesis for the second research question is thus suggested:

> *H2₄:*　　*Mean evaluations of cases presented alone are more narrowly distributed than of cases presented on days when multiple cases are presented.*

Examining the results (*F* test for unequal variances, Table 7,) the variance for these two samples was shown to be unequal at the 0.03 level of significance; however, the variance for the isolated cases is more narrowly distributed than that of the grouped cases. This result is opposite the relationship suggested in the hypothesis. The null, therefore, is not rejected.

| Table 7.  Mean Peer Evaluations = *f*(Case Isolation) | | |
|---|---|---|
| | Grouped Cases | Isolated Cases |
| Mean | 4.559 | 4.557 |
| Variance | 0.0085 | 0.0302 |
| Observations | 11 | 9 |
| Degrees of Freedom | 10 | 8 |
| *F* | 0.2813 | |
| p-value | 0.0323 | |

## CONCLUSIONS AND RECOMMENDATIONS

The purpose of this paper has been to explore the fairness and quality of student peer evaluations in accounting courses. Two questions were asked:  1) did students exhibit self-interested behaviours in assessing the performance of their peers; and, 2) were there qualitative shortcomings to peer evaluations?

In both questions 1 and 2, there seemed to be little evidence in the data gathered either that a) students behaved in a self-interested way; or, b) there were qualitative problems with peer evaluations.

On the subject of peer evaluations, guidance, perhaps in the form of specific instructions, should be offered to students on how to assign scores to the different dimensions of the peer evaluations. Knechel (1992) describes an interesting alternative to the method adopted here. Rather than having students evaluate each case presentation, Knechel suggests having students, at the end of the semester, name the five best presentations. Students would then be rank-ordered according to the number of votes they received. There are obvious scaling issues that might be encountered with this problem (e.g., several or many groups receiving no votes, a recency effect, etc.) This method may, however, offer better discrimination.

One dimension that was not covered in the evaluations was intra-group evaluation. There were, of course, several confidential complaints by team members that they were "doing all the work." The decision to assign grades equally to the team, rather than allowing intra-group allocations was done more for expediency than anything else. Since the grade component for the

case was only 5% of the overall grade, the cost of administering an intra-group evaluation was judged to be greater than its benefits. Were the component higher, or if there were greater concern for the extent of free-rider problems, an intra-group evaluation might be advisable. Several citations exist on methods of incorporating such an evaluation (see, for example, Knechel, 1992; Stout, 1996; or, Greenstein and Hall, 1996.) Additional studies of those pedagogical models need to be made in order to assess the fairness of the evaluation processes related to those models.

This study was not an experiment, in the traditional sense. Rather, the study examined various characteristics associated with a particular pedagogy and its implementation in a real classroom. Obviously, the first priority in the class was to have the best possible pedagogy and associated evaluation system in place, such that learning potential was maximized. There were, therefore, no experimental manipulations among subjects. Future research may be well served by examining student behaviors within an experimental setting where variables similar to those examined in this study can be evaluated under more controlled circumstances.

In particular, this study is limited in that students examined, for the most part, were traditional students who matriculated directly into the graduate program. Further, students examined in the study were predominately non-Hispanic white males. Effects of interactions among more diverse student populations are well worth considering in future study. Numerous studies, for example, find that male and female students are rated differently in peer evaluations (e.g., Park, DiRaddo and Calogero, 2009; Selinow and Treinen, 2004; Aires, 1996; and the many studies conducted by Sadker and Sadker, e.g, 1990.) Gender based interactions, as well as those among populations enriched with foreign students, African American students, non-traditional students, etc. are suggestive of possible extensions of the current study.

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# COMMUTER STUDENTS: INVOLVEMENT AND IDENTIFICATION WITH AN INSTITUTION OF HIGHER EDUCATION

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## ABSTRACT

*Many institutions of higher education cater to an ever-increasing number of commuter students. Previous research has shown that commuter students differ in their demographic and psychographic profiles when compared to non-commuter students. Additionally, it is important to understand the differences in commuter students' attitudes and opinions as they relate to identification with the institution. This study examines both demographic and psychographic differences between commuter and non-commuter students as they may impact institutional offerings and marketing efforts. This research shows that there are significant differences between commuters and non-commuters in such key areas as age, employment, and life responsibilities. In turn, these differences lead to differences in commuter student involvement with institution-sponsored activities, attitudes and opinions about the institution's reputation, identification with the institution, and one's inclination to join the school alumni association. Finally, implications for institutional marketing efforts and individual class formats are discussed.*

*Keywords: commuter students, demographics, psychographics, institution identification, institution commitment, involvement, alumni association*

## INTRODUCTION

Since the 1980's, many public universities in the United States have evolved from "state" universities to "state supported" universities. A "state-assisted" university is one that receives less than 50% of their budget from the state (Archibald and Feldman, 2004). In order to overcome this gap in resources, it is important for universities to become more marketing oriented.

The traditional student of yesterday is rare in today's world. There are not many of the typical residential colleges in which a full-time student enters immediately after high school,

lives in a dormitory, and rarely works because the parents are their source of support. Less than a quarter of today's undergraduate population fits the description of a traditional student (Attewell and Lavin, 2007). Approximately seventy-five percent of college students are commuters (Recruitment and Retention in Higher Education, 2006). A *commuter student* is defined as one who does not live on campus (Recruitment and Retention in Higher Education, 2006), but attends the university from local and surrounding areas (Schibrowsky and Peltier, 1993). In today's competitive environment, it is essential to understand the needs, attitudes and opinions of the large group of the commuter students who ultimately pay many of the school's bills. Understanding group differences between the commuters and non-commuters is critical, as the commuter population nationwide continues to increase and universities are forced to compete for the patronage of these commuter students.

Commuting and non-commuting students may be differentiated among three basic dimensions: (1) socioeconomic and demographic differences; (2) academic differences; and (3) non-school obligations and activities. In general, the commuter student's average age and standard deviation of ages tend to be higher than non-commuters. Commuter students are more apt to come from blue collar families with less income and educational background. These commuter students are also more likely to be first generation college students and be less academically prepared for college (Schibrowsky and Peltier, 1993). Many of these commuting students are likely to cycle in and out of college. They may postpone re-enrolling in college and work more hours, so that they can afford the next semester's tuition. Conversely, they may discontinue enrollment in order to take care of their family needs and obligations. For many commuting students, a college degree is something that must be fit into the rest of their life and not the other way around (Attewell and Lavin, 2007).

Understanding the commuter student is becoming more and more important. Yet, their lives are becoming increasingly complex. Universities need to consider whether it makes sense for the commuting student to pay fees for programs that they will almost certainly never use. The commuter student is less likely to use the recreational center or attend a sporting event, but they still pay the fees. It is important to understand what is significant to the commuting student from the standpoint of tuition and fees. Additional issues that may differentiate commuters and non-commuters include their motivation to attend college, their support groups, how they spend their time, their involvement in school, and their attitudes towards the university. With this growing trend in commuting students expected to continue into the future, understanding the commuter student allows universities to better meet their needs (which is exactly what the marketing concept is all about).

## LITERATURE REVIEW

University education becomes more productive and complete as students develop relationships with their peers and faculty (Astin, 1993; Astin, 1999). Being involved in the

university is thought to have a positive effect on the learning experience (Rubin, 2000). For a commuter student, these relationships on campus and involvement in activities may be more complicated. The commuting student tackles challenges that the non-commuting student typically doesn't face, especially feelings of isolation, multiple life roles and different support systems.

## ALONE WITH OTHERS

Commuter students are projected to participate less in school activities, campus social events, and be less involved with fellow students and faculty. Research has shown that students benefit and are positively affected by social and academic integration (Lundberg, 2003). They are aware of the notion that they no longer fit the traditional student role. Further, they do not have great expectations that the college will have special programs to assist with the non-traditional students' academic goals (Newbold, Mehta, and Forbus, 2009-2).

Multiple Life Roles

Commuter students are more apt to be older, work full time, and have a family or extended family to support (Bye, Pushkar, and Conway, 2007). This places them in the construct of a non-traditional, mature student. In general, mature students tend to be more diverse than younger students in their expectations of the college or university, in their motivations for attending, and their experiences with higher education (Compton, Cox, and Laanan, 2006). As would be expected from their age, the most common characteristic of non-traditional students is that they are generally more financially independent (Evelyn, 2002). However, a lack of financial management skills can result in withdrawal from higher education pursuits for older students because of their additional financial burdens (Hart, 2003).

Commuter students are likely to limit their time on campus because of a more complex lifestyle than non-commuting students (Recruitment and Retention in Higher Education, 2006). Traditional students spend a majority of their time on or around campus, while commuters often have other requirements such as working (possibly more than one job) or taking care of their own (or extended) family, all the while being encumbered with commuting to and from campus for classes (Jacoby, 2000). With these other responsibilities, the commuter student is more likely to schedule classes during the same blocks of time (Jacoby, 2000). In other words, commuters register for Monday, Wednesday, and Friday or Tuesday and Thursday classes. Optimizing their time for other facets of their life reduces the amount of time spent on campus and the time spent developing relationships with peers and faculty. This lack of on-campus interaction hampers student involvement and engagement which are presumed to lead to success (Lundberg, 2004). Further, absenteeism from classes has been shown to be positively correlated to lower levels of academic achievement (Sauers, McVay and Deppa, 2005). Approximately 70 percent of commuter students reported working while continuing their careers (Smith, 1989). This results in a more "vocational" mind set. These students would prefer to spend the time and effort on their

career, which is providing the financial support for their lifestyle, than on acquiring what may be considered theoretical knowledge that cannot be readily applied to the job setting. The commuter is pursuing a degree as a credential (Smith, 1989) whereas the non-commuter is considered to be interested in gaining knowledge for continued development and growth as a person.

## DIFFERENT SUPPORT SYSTEMS

The fact that commuter students lead complex lifestyles may also mean that they have different support systems than the non-commuter students. Since they live and work away from the campus, their support systems are also off campus. The traditional residential student has support systems on campus readily available when faced with a problem. Counselors, advisement centers, and professors are there to help with school troubles. Peers, friends, and roommates lend support with other potential problems that they understand and are also facing (Ruchti, Mehta, and Newbold, 2008).

The commuter student may have no one in their support group who is experiencing the same situations. Their support is usually made up of family members, coworkers, and friends. It is difficult for these support group members to relate both to the stresses and the demands of higher education (Jacoby, 2000). Members of their support group may not understand why commuter students spend time studying instead of with the family or on work projects.

Because they spend less time on campus, it is thought that commuter students are less engaged in college activities. Since students learn while being involved, this hinders commuting students' success (Astin, 1999). It has been shown that "the more time and effort students invest in their learning and the more intensely they engage in their own education, the greater will be their achievement, growth, satisfaction with the college experience, and likelihood of persistence toward attainment of their educational goals" (Jacoby, 2000, p.9).

## HYPOTHESES

### Commuter Students as Non-traditional Students

In this research, the first goal is to establish whether commuter students today are significantly diverse from non-commuter students. Previous research has shown that commuter students are more likely to show the characteristics of the non-traditional student: characteristics such as being over 24 years of age, working full time, and usually having dependents to support (Bye, Pushkar, and Conway, 2007).

*$H_1$: Commuter students are more apt to be non-traditional students than non-commuter students.*

## Commuter Students Itinerant Nature

The variables relating to transferring students, number of colleges/universities attended, and numbers of years at the graduating university, helps to illustrate the differences between commuter and non-commuter students. These characteristics speak to the general itinerant nature of the typical commuter student's educational experience. In fact, transferring students generally tend to feel isolated and disconnected from the student body at a new school. It is shown that commuter students tend to cycle in and out of college, fitting classes in when it coincides with the rest of their life (Attewell and Lavin, 2007).

$H_2$: *Commuter students are more likely to be transfer students than non-commuter students.*

## Commuter Students' Work and Income

Schibrowsky and Peltier (1993) determined that commuter students typically work more hours than non-commuters students. This does not necessary mean they are working towards enhancing their career. In fact, many of them are working to pay their bills. Since commuter students are playing multiple roles, they tend to be time-deprived, work more hours, and spend time commuting to and from campus during the week (Jacoby, 2000).

$H_3$: *Commuter students are more likely to work more hours per week than non-commuter students.*

$H_4$: *Commuter students are more likely to earn more income than non-commuter students.*

## Commuter Students Assimilation

Commuter students often lack a sense of belonging to the university. The limited time on campus allows students less interaction with peers and faculty, and as a result fewer relationships are believed to be developed. Commuter students rarely feel connected to a place where they have no significant relationships (Jacoby, 2000). Generally, commuter students spend a lot of time "out of the loop", unaware of campus events, or unable to attend. Many will focus on getting their degree and graduating rather than interaction with their peers and forming lasting relationships (Pemberton, 2009). Research has shown that success in college and a feeling of a fulfilling college life is correlated to involvement in the university (Astin, 1993).

$H_5$: *Commuter students are less likely to be involved in school-sponsored activities than non-commuter students.*

## Commuter Students' Attitudes and Opinions

Individuals who identify strongly with their university and view it as being prestigious, distinctive, and competitive with other higher education institutions are more likely to display an attitude of support for the institution (Mael and Ashforth, 1992). Commuter status appears to be the biggest driver to *precluding* students from perceiving the school in a favorable light, identifying with it, and joining the Alumni Association (Newbold, Mehta, and Forbus, 2009-1)

$H_6$: *Commuter students are less likely to believe the university is distinct than non-commuter students*

$H_7$: *Commuter students are less likely to believe that the university has a good reputation than non-commuter students*

$H_8$: *Commuter students are less likely to identify with the university than non-commuter students*

$H_9$: *Commuter students are less likely to be interested in joining the Alumni Association prior to graduation than non-commuter students*

## METHOD

### The Survey Instrument

The instrument designed for this study was a self-administered, structured, undisguised questionnaire. Prior to the regular study, a pilot study was conducted with a representative sample of the population (Alreck and Settle, 2004). This was mainly done to determine accuracy of instructions, wording of the questions, appropriateness of scale, etc. Since the topic under investigation was somewhat sensitive, extra care was taken to eliminate any ambiguity in the questionnaire. Seven-point modified Likert scales were used extensively to assess the following: Student attitudes, opinions, and reasons for being in a university,

- Their level of involvement and participation in various university activities,
- Their attitudes towards their work (if they did not work, they could skip this section),
- Their social life and relationships with various reference group members,
- Their general opinions about attending and selecting their university,
- Their time management strategies,
- Their attitude towards stress,
- Their stress coping strategies.

Approximately 3-4 items were developed to represent each construct under investigation. Nominal to ratio scales were used to obtain classification information. The survey took between 10 and 12 minutes to complete. To encourage participation from respondents, all completed responses were eligible to participate in a random drawing.

## Sampling and Data Collection

The study was conducted among a projectable sample of the 4th-year student (i.e., senior status was used as a filter question) population at a mid-sized southwestern state university. The overall ending sample was 453 students (from a population of approximately 3000 seniors), of which 108 met the criteria as commuter students. The university where this study was conducted has a significant amount of housing within five miles of the campus, which is typically occupied by students who have moved to the area to go to school. Commuting students are considered to be living outside of the county where the school operates and have not relocated to attend the school.

## Factor Development

The items in the survey were developed based upon the literature review and the special circumstances of the institution where the research was conducted (Churchill and Brown, 2007). For each construct, correlations between the items were examined to determine if further inclusion of each item was warranted. Following the deletion of spurious items, exploratory factor analyses were conducted for each construct utilizing principal components with varimax rotation. Factors with eigenvalues greater than 1 were retained. Since this was primarily an exploratory study, a minimum factor loading of 0.30 (Nunnally, 1978) was used as a guideline for including items in a factor. The reliability of each factor was evaluated utilizing an internal consistency measure. Factors with Cronbach alpha less than 0.70 were not used for the analysis. Rather, the analysis was performed utilizing individual items. Table 1 summarizes the reliability of the factors utilized to test the various hypotheses.

| Table 1:  Summary of Factors Utilized ||
|---|---|
| Factor (No. of Items) | Cronbach Alpha |
| Distinct (3) | .713 |
| Reputation (7) | .913 |
| Involvement (3) | .721 |
| Commitment (5) | .952 |

## Analyzing Differences between Commuter Students and Non-Commuter Students

Nominal data were analyzed primarily through Chi-square analysis. Findings at the 0.10 significance level were accepted.  Differences in factors and scaled items were determined via t-tests for means among independent groups. Again, findings at the 0.10 significance level were accepted.

# FINDINGS

## Demographics

Table 2 summarizes the findings from the first five hypotheses of the study. The first hypothesis stated that commuter students were more likely to be non-traditional students (i.e., more than 24 years old). This hypothesis was confirmed, as 53% of commuter students were classified as non-traditional, while only 10% of non-commuters were classified as non-traditional. Thus, the commuter students were more than 5 times more likely to be non-traditional students.

Commuter students were also more likely to be transfer students. Keep in mind, the survey was conducted among 4th year college students. Among commuters, 73% of the students had transferred into the school. For non-commuters, this figure was 42%. Thus, as predicted by Hypothesis #2, commuters were seen as being more prone to have transferred in.

Interestingly, there were no significant differences between commuters and non-commuters when it comes to whether or not they were working. Roughly 80% – 85 % of non-commuters and commuters, respectively, report working while going to school. However, as hypothesized, commuter students were found to work *more hours per week* than non-commuters. Over half of all commuters (51%) report working over 21 hours per week, while this figure for non-commuters is only 37%. These findings support Hypothesis #3.

Hypothesis #4 was also supported. Given the fact that they are non-traditional students and likely to be working more hours per week, commuter students are more likely to have higher personal incomes. While nearly 70% (69.4%) of non-commuters report earning less than $10,000 per year, only 31 % of commuters report earning commensurately low incomes. This is less than half the proportion of non-commuters.

| Table 2:  Chi-Square Summary – Demographics | | | |
|---|---|---|---|
| Hypothesis | Item | Pearson Chi-Square | p-value |
| $H_1$ | Non-Traditional Student Status | 87.327 | 0.000** |
| $H_2$ | Transfer Student Status | 31.641 | 0.000** |
| $H_3$ | Time Spent Working Per Week | 6.540 | 0.038* |
| $H_4$ | Personal Income | 59.410 | 0.000** |
| * p-values are significant at alpha = .05   **p-values are significant at alpha = .01 | | | |

The next hypotheses deal with students' sense of assimilation into the university culture. The results are seen in Table 3. As hypothesized (Hypothesis #5), commuters are significantly *less likely* to take part in university-sponsored events. This is not surprising, given their greater

propensity to be non-traditional students who work significantly more hours per week, thereby reducing the time available to attend university sporting or social events. The commuter students' focus away from the university would explain their lack of familiarity with many of the alumni services and activities on campus.

Also as expected, commuter students are significantly *less likely* than non-commuters to view their school as either "distinct" or as having a "good reputation". These findings, which support Hypotheses 6 and 7, emanate from the itinerant education history of most commuter students, combined with their relatively lower involvement in campus-sponsored activities. All of the aforementioned leads to the finding that commuter students are significantly less prone to "identify" with the institution, confirming Hypothesis 8.

The preceding shortfalls in involvement, regard and identification, lead commuter students to be significantly less likely to want to join the Alumni Association (Note: Students who are close to graduation are often solicited to join the school's Alumni Association prior to graduation). This confirms Hypothesis 9.

| Hypotheses | Item | Commuter Mean | Non-Commuter Mean | T-score | p-value |
|---|---|---|---|---|---|
| $H_5$ | Involvement in Institution-sponsored Activities | 3.40 | 4.84 | 7.990 | .000** |
| $H_6$ | University as Distinct | 4.72 | 5.11 | 3.248 | .001** |
| $H_7$ | University has Good Reputation | 4.71 | 4.94 | 1.747 | .081* |
| $H_8$ | Identification with University | 5.06 | 5.36 | 1.940 | .053* |
| $H_9$ | Interest in Joining the Alumni Association Prior to Graduation | 3.36 | 3.79 | 2.089 | .037* |

**Table 3: Means Test Summary – Attitudes/Behaviors**

**p-values are significant at alpha = .05     *p-values are significant at alpha =. 10

## DISCUSSION

The research conducted supported all of the hypotheses. The findings are instructive as to the special challenges facing institutions of higher learning and their administration and faculty when it comes to engaging commuter students and developing long-lasting relationships with them. More specifically, commuter students are found to be more apt to be non-traditional students, transfer students, work more hours, and earn more income.  In addition, commuter students are less likely to be involved in school-sponsored activities, less likely to believe the university is distinct; less likely to believe the university has a good reputation, and less likely to identify with the university.  Therefore, commuter students are less likely to be interested in

joining the Alumni Association. In summary, they are less involved while in school and indicate they will continue that relatively low level of involvement once they graduate. This distinction between commuters and non-commuters is critical when universities are trying to raise funds to close the gap between state funding and their annual budgets.

**A Typical Commuter Student**

To further understand the implications of these challenges, let us consider the daily life of "Ralph", a hypothetical commuter student. Ralph shares his home life with a wife, two children, and a mother-in-law. He has a job with a local manufacturing company as a shop floor supervisor. He would like to complete his undergraduate degree to help facilitate his promotion to the next level of management. Ralph negotiated his work week with his employer so that his two days off would be Tuesday and Thursday rather than the traditional Saturday and Sunday. He spent two years at a community college completing the typical core requirements. Ralph enrolled in a university scheduling all his classes on his two days off from work. This arrangement required coordination with professors for access to classes that fit his time frame.

Ralph is responsible for transporting his children to their school each morning because his wife needs to be at her job early. His mother-in-law picks up the children after school. This means that Ralph leaves home at 7:00 am each morning to have the children at school by 7:30 am and to be at work or the university by 8:30 am. Some mornings there are traffic problems which cause delays in his commute. On Tuesday and Thursday, Ralph's four classes are from 9:00 am to 2:00 pm with a break at noon. The noon hour is typically spent studying while grabbing a bite in one of the restaurants in the student center. Immediately after his last class, Ralph heads home to study and complete class assignments.

When Ralph drives to the campus, he takes the same route each day and parks in the same parking lot, often times far away from his classes. He typically proceeds directly to his classroom, frequently making it there barely before class starts. Normally, Ralph does not engage any of his fellow students: "traditional" students cannot relate to his situation, and other commuter students do not have time to engage him. When Ralph has some issue with his finances or course schedule, he is most likely to ask one of his professors, as he is pretty much unfamiliar with how to navigate the administrative machinery of the institution.

The schedule Ralph keeps does not allow him time for partaking in school-sponsored activities, such as the homecoming football game or the annual lighting of the Christmas lights. In fact, he proceeds through his college career mostly unaware of these types of events.
Implications for the Institution

As the "Ralph" scenario above illustrates, there are significant challenges to developing longer-term relationships with commuter students. Traditional events and marketing approaches go mostly unnoticed by busy commuters who shuffle to and from their classes and do not partake of the traditional student experiences. Commuter students may express feelings of being treated

like a second-class student, and come to resent paying fees for services they do not use, while many of their particular needs (such as convenient parking) go unmet. Commuter students pay for such unused amenities as the recreational center, health center, student center, athletic fee, advisement fee, etc.

Perhaps the institution should take a more segmented approach to the fees it levies and the services it provides. Commuter students, for example, might be more amenable to fees for ancillary services such as lockers or a special locker room for changing prior to returning to a job after classes, a partnership with a gas station located on campus which offers student discounts, special (or even valet) parking for commuter students, and day care facility for their kids, etc. In an attempt to cater to the needs of the growing number of commuter students, universities could add a web page on their site with special issues for commuters such as time management tips or a link to area traffic information usually provided by the surrounding cities.

## Implications for Individual Course Formats

The trend toward increasing numbers of commuter students also puts pressure on instructors at the class level. It is often difficult for commuters to maintain regular attendance at classes. As previously discussed, commuter students tend to leverage the course instructor for information and assistance in regard to university issues outside of normal classroom activities. Indeed, previous research has shown that faculty members may be best served by re-thinking their roles, and concentrating more on "learning delivery" aspects of courses, rather than the traditional "upstream" focus on content (Sasse, Schwering, and Dochterman, 2008) Hybrid classes represent a possible option, whereby students have the opportunity to meet with their professor part of the time and complete a certain portion of the coursework online. In these hybrid courses, instructors leverage the Internet and Internet-based course management systems to provide more flexibility and more around-the-clock access and support to class activities. Overall improvements in communication technology which affords more opportunity for synchronous communication has been posited as a facilitator of the increasing trend in online courses to meet the needs of non-traditional students (Gupta, Eastman & Swift, 2005) Finally, study groups can be *formally* incorporated into course designs and syllabi to provide for a support system outside of the course instructor.

## FUTURE RESEARCH

Future research is needed to develop a more thorough understanding of the balance of family life, work life, and school life for both commuter and non-commuter students. Further learning in this area will assist institutions in better understanding student motivations and behaviors, and assist in developing programs and courses which better meet the needs of students. In addition, it is also relevant for universities to study the programs and fees structures

that are levied on students. Future research could add to the information base and help conclude if commuters and non-commuters want different amenities paid for by their fees. It might be found that commuter students would prefer to pay one set of fees for things that they would need (e.g., lockers, commuter lounge, assigned parking, etc.), and non-commuter students would pay fees for the things that they use (e.g., the recreation center, climbing wall, sporting pass, etc.). Perhaps more positive attitudes and a greater sense of commitment could be achieved, once the university better meets the needs and desires of its various student subgroups.  With great success, some universities (e.g., University of Phoenix, NOVA, etc.) have built their entire business model around the needs of both commuters and non-traditional students.

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