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# A Perspective on Student Evaluations, Teaching Techniques, and Critical Thinking 

Prashant Tarun<br>Missouri Western State University<br>Craig School of Business<br>St. Joseph, Missouri<br>Dale Krueger<br>Missouri Western State University<br>Craig School of Business<br>St. Joseph, Missouri


#### Abstract

In the United States System of Education the growth of student evaluations from 1973 to 1993 has increased from $29 \%$ to $86 \%$ which in turn has increased the importance of student evaluations on faculty retention, tenure, and promotion. However, the impact student evaluations have had on student academic development generates complex educational issues. These issues involve teaching critical thinking skills, teaching to the student evaluations, types of tests, grade inflation, student interest in the subject matter, and a student's sense of entitlement. To avoid the moral and ethical issues associated with educational development and student evaluations, this research compared multiple choice and essay exams as well as comparing an existing student evaluation instrument with another student evaluation instrument. The purpose of this research is to explain the impact of different types of tests with different types of subject matter in an attempt to clarify and reduce distortions, and biases associated with a system of learning that encourages academic development.


## INTRODUCTION

This paper covers several important aspects of learning in the United States: type of tests, the critical thinking associated with the tests and the impact of student evaluations on evaluating faculty for promotion and tenure. The introduction first addresses the type of tests and secondly proceeds with the regulations and impact that has developed regarding how to regulate and interpret student evaluations.

First, in the United States multiple choice tests have become heavily used, which raises the question whether multiple choice exams are used too extensively (Phelps, 1996). These exams consist of a stem and a set of options or answers that the person taking the exam can choose the option that has the correct answer called a key and the incorrect answers called distractors (Kehoe, 1995). This type of test does not require the teacher to interpret answers, which helps eliminate teacher bias (DePalma, 199Ø). The advantages pertain to limited types of knowledge that allows for one answer, which limits testing to lower-order subject matter that has a specific structure. Subject matter that involves problem solving and higherorder reasoning skills are better suited using the essay. Essays are used to judge the comprehension of the material
which requires the student to write their answers in an organized presentation.

The essay takes on a number of different forms and styles. The cause and effect requires a causal chain that connects ideas. Categorization breaks ideas into smaller parts. The comparison and contrast analyzes differences between concepts and ideas whereas the descriptive essay provides details usually associated with emotional, physical and intellectual state of the topic. The dialectic and critical essay focuses on an argument or supports a position and usually has examples to clarify a position of strategy. The last two dialectic and critical are usually utilized in Strategy Management classes.
Second, for student evaluations the State of Missouri Legislature passed a law requiring all state colleges and universities to post all student evaluations for all faculty members. Therefore, eliminating student evaluations was not an option at Missouri Western State University or within the Craig School of Business. To assess and improve the use of student evaluations a committee was formed in the Craig School of Business to develop a more in depth perspective on how to interpret student evaluations. At the same time the first step was to develop a new student evaluation instrument that had greater validity and reliability. The second step was to analyze the differ-
nces between multiple choice tests and essay tests. The hird step was to provide information on a comprehensive ystem of learning associated with business courses. . Because of the different business disciplines, this study analyzes grades, type of tests, types of students (left or right a highain, class size, different types of cours (lower and higher level), different critical thinking levels, different course materials,
student perceptions.

The research for student evaluations was done at Missouri Western State University, a regional university with $60 \emptyset \emptyset$ tudents. It is an open door university broken down into three separate schools: Liberal Arts, Professional Studies, and The Craig School of Business. Within each school various departments set their own admission requirements. For admission into The Craig School Business students have to have a 2.5 grade point average or an ACT of 21. The average ACT in the School of Business is 21-22. After admission students have to declare a major in one of the four disciplines: accounting, finance, marketing, and management.
The initial step in analyzing student evaluations was very straight forward. There are occasionally "outliers" or rogue respondents in college classes who demonstrate no interest in accuracy or fairness in student evaluations of teaching. Anyone who has taught for a decade or so can probably recall student evaluations done in $2 \emptyset$ seconds or less that had all " 5 's" or all "e's" [whatever the lowest mark was] for every question. In small classes when these are counted at full value with the others, they tend to bring down average scores significantly. For example, in one $40 \emptyset$ level evening class that Professor M had at this school, there were 8 students. Seven students filled in evaluation forms. Two of the seven consistently rated the instructor at $3^{1}$; and the other five were mostly 1 and 2 ratings. The result was that the instructor had an average rating of 1.82 with a $\emptyset .78$ standard deviation. Without the two outliers, the instructor would have an average rating of approximately 1.40 . The 1.4 would place the instructor in the top half of instructors university-wide ( mean $=1.555$ ) and still higher in the school of business (mean $=1.894$ ). The question is whether the differences are statistically significant to warant a decision on who is the better teacher? According the statistical research the statistical significant research can be strong or weak and small or large. For example, the difference between student evaluations of 1.90 and 1.94 at a significant level of .05 with a standard deviation of .8 requires a sample size of 3074 using a $Z$ test of independent samples (McClave \& Benson, 2øø8).
Despite the statistical difficulty of measuring student evaluations we proposed to pilot an evaluation instrument that would contain five or so factual questions. For-
mally, we hypothesized that the "rogue respondents"2 or "outliers" would answer the factual questions accurately Privately the speculation is that this might not be true. an initial sort were false and the speculaion the, the duct of the class that were factually wrong should make the remaining evaluations more reliable. For uxample the remaining evaluations more reliable. For example, a
student who is so disengaged from the class as to be unable student who is so disengaged from the class as to be unable
to answer how many exams there have been or when did to answer how many exams there have been or when did the instructor pass out the syllabus for the course may no answer the question accurately. If the factual questions are
not accurately answered this cancels the reliability of the not accurately answered this cancels the reliability of the
respondent to questions about the pedagogy of the course. respondent to questions about the pedagogy of the course
Again, this was the initial hypothesis. Another hypoth Again, this was the initial hypothesis. Another hypoth
esis was that the use of responses only from respondent esis was that the use of responses only from respondent
who were at least approximately correct on the factual questions would not affect the scores for most instructors. We did not have a firm grasp regarding this second hy pothesis. As a result our recollections had been limited to outliers who were determined to "punish" instructors for various, frequently [but not always) "imagined" slights or transgressions (Greenberger, 2øø8).
To present on student evaluations research other variable into some type of context and framework, a review of the literature on educational progress grade inflation, student interest in subject matter, critical thinking and the type of subject matter, perception of students toward left brain and right brain subjects, student assessment about the difficulty of obtaining a grade in various courses, and the implications and suggestions for evaluating student evalu ations was undertaken.
This study attempted to compare two evaluations instruments the present one in use at Missouri Western state University and a newly designed instrument that incorporated various aspects student learning (critical thinking) along with questions that hopefully provided more appropriate criteria on improving the reliability and validity of student evaluations of the instructor. In addition multiple choice tests and essay test results were compared between Strategic Management and Principles of Management that permitted an analysis associated with an integrated system of learning.

## REVIEW OF THE LITERATURE

In 1981, the National Assessment of Educational Progres identified critical skills that workers will need to survive in the 21st century: "Skills in reducing data, interpret ing it, packaging it effectively, documenting decisions explaining complex matters in simple terms and persuad ing" (NAEP, 1981). These skills point toward the need for colleges and universities to identify and develop students abilities to "to turn facts into concepts, to turn concepts
into a policy or plan, and to see the issue and define the problem within a problematic situation" (Flower, 199Ø). Since 1981 periodically attention has been drawn to adult literacy and the problem associated with workers that do ing becoming more complex and technical. The problem isn't people who can't read and write, but those who read nd write at lower levels than the task demands (Grimsley 1995). Despite the attention to the goal of improving our 1995). Despite the attention to the goal of improving our educational system and concomitantly the skills of our students not much progress has been made by our eduschools better for our children (Symonds, 2øø1).
The goal of developing critical thinking skills in students and the goal of improving student evaluation numbers in higher educational institutions has generated moral and professional conflicts for college and university adminisrators and faculty. An important question that should be addressed is whether educators are focusing their efforts on addressing educational improvement or have rather adapted their tests, courses, and classroom demeanors to improve their student evaluation numbers? The research, points toward faculty pandering to modern students' sense of entitlement. This sense of entitlement appears to be widespread, and depending upon the amount of administrative pressure placed on faculty to generate "good" evaluations, the amount of pandering appears to be substantiated by a number of studies against the use of student evaluations for retention, tenure, and promotion (Baldwin and Blattner, 2003; Green, Calderon, and Reider, 1998).
Studies that deal with student evaluation criteria and administrative cognitive processes in performance appraisal that were conducted in field settings raises questions about the usefulness of this practice. Despite the lack of reliable and valid information business schools use the evaluations for a number of purposes (Cleveland, Murphy, Williams, 1989). The results of these evaluations are used for various human resource decisions. However, if the objectives in the evaluation instrument are unclear and the criteria measuring those objectives are vague, there will be an unsatisfactory payoff for the employee, the organization, and the evaluative participant. The result can be confuion and misapplication. For example, student evaluations may depend on the context of other students, on previous student performance, the level of student development, the type of subject matter, student's interest in the subject matter, testing difficulty, instructor's knowledge, teacherstudent relationships, the teacher's organizational skill, communication skill, and the content difficulty.
To unravel the evaluation process researchers have attempted to design standardized instruments to improve
the reliability and validity of the ratings. Unfortunately there is no substantial evidence to support the fact that student evaluations improve instructional quality (Ad ams, 1997), and yet the research indicates college instruc tor's should be measured against seven dimensions: (1) instructor knowledge, (2) testing procedures, (3) student teacher relations, (4) organizational skills, (5) communi cation skills, (6) subject relevance, (7) utility of assignments (Robbins, 2øøø). Although these dimensions have been identified, the problem is universities and colleges have tried to implement classroom evaluations to gather information on students perceptions of what transpired in the classroom during the duration of the course to obtain information for promotion, retention, and feedback. These evaluation instruments have fall short. For exam ple, one aspect of the research indicates non-verbal behavior warmth and supportiveness (interpersonal behavior) are related to the teacher's student evaluation (Ambady \& Rosenthal, 1993). However, these dimensions need criteria to support the seven dimensions. For this study two evaluation instruments were compared to provide a possible benchmark and greater understanding of studen evaluations and the impact on critical thinking, which in cludes differences between test multiple choice tests and essay tests.
Because of the emphasis in higher education on student evaluations, grade inflation seems to correlate with the in creased use of anonymous semester-ending student evaluations. In $198727 \%$ of the high school students taking the SAT test had GPA's in the A-plus to A to A minus range, and by 2007 the percentage of " $A$-students taking the SAT had increased to $43 \%$ (Caperton, 2009). Thi grade inflation contributes to what students perceive a self-entitlement. This self-entitlement translates into students pressuring professors for higher grades based on their special needs and preferences (Greenberger, Lessard Chen, \& Farrugia, 2008). At the university level recen research has pointed out that studentevalutions are positively correlated with grades (Weinberg, Hashimoto, \& ations play a very significant role in tenure and promotion ations play a very significant role in tenure and promotion,
Therefore, it is not unusual for faculty to resort to open Therefore, it is not unusual for faculty to resort to open that er higher ${ }^{2}$ d focus on educational development Harvard reperted "ocus fou coll A's and another fouth are 's (Mansfild 2001).

The most recent article on complex reasoning and writin skills (General collegiate skills appeared in the Chronicle of Higher Education on January 20, 2011. (Vedder, 2011) Using the Critical Leaning Assessment (CLA) to measur the gains in critical thinking, reasoning, and writing skills
the findings did not show measureable improvement for college students. Over four years of college work $36 \%$ of the students did not show improvement in learning, suits. The study indicated students spent less than thirty hours per week on academics, and seniors had not completed a course with 20 or more pages of writing in a prepleted a course with 20 or more pages of writing in a preLiberal arts students had somewhat higher gains in critical thinking, reasoning and writing compared to students in business, education, social work, and communication. What was significant was the time spent studying alone: five hours. The Arum and Roksa study indicated studyfive hour. Thas more effective than collaborative learning Arum and Roksa, 2011).

## METHODOLOGY

This project included the designing and piloting an alternative student evaluation instrument. The process was to incorporate five factual questions into the instrument. This approach embraced the idea that if these factual questions were correct, then the remaining questions within the student evaluation instrument would improve validity and reliability. For example, using the Missouri Western State University evaluation instrument the student who is so disengaged from the class as to be unable to answer how many exams there have been in the course to answer how many exams there have been in the course
would not be able to respond appropriately to questions would not be able to respond appropriately to questions
about the pedagogy of the course. The alternative student evaluation instrument requires students to answer factual questions. If these factual questions were not correct, then the instructor's overall student evaluation ranking would not be correct.
To statistically compare the two student evaluations instruments the null and alternative hypotheses follow:

## Null Hypothesis:

$\boldsymbol{H}_{\theta:}$ : There is no difference between the instructor's overall teaching effectiveness rating for a class obtained using the old survey instrument and the instructor's likeability rating for a class obtained using the new survey instrument.
Ho: There is no difference between multiple choice and essay exams

## Alternate Hypothesis:

$\boldsymbol{H A}$ : There is a difference between the instructor's overall teaching effectiveness and likeability rating for a class obtained using the old survey instrument and for a class obtained using the new survey instrument.

Three instructors used the new evaluation instrument in the following classes:

- Instructor one: class 1 Management of Organiza tions, classes 2-4 Strategic Management
- Instructor two: class 1 Advanced Income Tax classes 2-3 Business Law
- Instructor three: class 1: International Finance, class 2: Finance Principles, classes 3-4: Introduction to Statistics

Ha: There is a difference between multiple choice ex ams and essay exams

## A Comparison of the Two Survey Instruments

Assumptions: In order to compare the old (current university form) with the newly piloted form, we had to make certain assumptions. They were:

1. Likert scales for old and new survey instruments are comparable; and
2. Instructor's likeability ratings from the new survey instrument can be compared with the ratings of instructor's overall teaching effectiveness from the old survey instrument.
To statistically compare the two evaluation instrument the Mann Whitney U Test was utilized.
In evaluating the statistical results using the Mann-Whit ney for five senior level courses and six sophomore-junio level courses, the teaching effectiveness for the old instru ment and teaching effectiveness and the likeability rating for the new instrument supported the null hypothesis and produced no statistically significant difference between the two evaluation instruments. There was no significant difference between the old instrument and the new in strument.
Although the Mann-Whitney helped to analyze the Likert scale questionnaires further statistical procedures were tested for association patterns (co-linearity) between the 25 questions on the new instrument. To test for associa tion patterns between survey questions Chi-squared (nonparametric) was used. There were 209 surveys given to total of 209 students in 11 classes taught by three differen For each of these questions, the answer choices were en tered as numbers $1,2,3,4$, and 5 for choices $a, b, c, d$, and e, respectively. The instrument was designed to contain 6 embedded "fact" questions that we intended to use on a preliminary sort to eliminate those students whose course involvement was so tenuous as to prevent them from an-
wering what we thought of as simple questions of fact relating to the course.

To test for likeability question (numbered 18) asked the students to respond to this statement: "Indicate your agreement with this statement: ' I like the instructor for this course."'3 When we checked on association patterns using the Null Hypothesis that there was "No association between two variables (or questions), it was discovered hat Q 18 was associated with almost two-thirds ( 15 of 24) of the questions. Therefore, question 18 determined the overall average for the instructor. To explore this association link between questions further analysis was required.
On this next round of analysis the results were broken down by instructor and the classes they taught in spring semester 2ø09. To maintain anonymity, instructor names and classes were not identified in this report. Instead, we assigned arbitrary numbers to the instructors and to the classes so that "11" represented instructor \#1 class \#1; "12" designated instructor \#1 and class \#2, and so on and so forth. Each student's answers to the fact-based questions: Q1, Q3, Q4, Q13, Q21, and Q25 were evaluated to identify students that did not agree with the answers picked by majority of students in the class. If there were differences between some student evaluations and the majority of student answers, then class/instructor evaluations become skewed by students who do not display a basic level

| Table 1 <br> Results for Old Survey Instrument |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Instructor | Class | $\begin{aligned} & \hline \text { Class } \\ & \text { Size } \end{aligned}$ | Instructor's Teaching Effectiveness Rating for the Entire Class |  |
|  |  |  | Mean | Std. Dev. |
| 1 | 1 | 28 | 2.214 | 0.917 |
|  | 2 | 10 | 1.6 | 0.699 |
|  | 3 | 10 | 3 | 1.333 |
|  | 4 | 32 | 2.6875 | 0.965 |
| 2 | 1 | 10 | 1.4 | 0.699 |
|  | 2 | 28 | 2.321 | 1.09 |
|  | 3 | 13 | 1.923 | 0.954 |
| 3 | 1 | 18 | 1.444 | 0.705 |
|  | 2 | 24 | 1.79 | 0.93 |
|  | 3 | 26 | 1.3846 | 0.571 |
|  | 4 | 12 | 1.25 | 0.452 |
| 1- Exceptional, 2-Average, 3- Below Average, <br> 4- Fair, 5- Poor |  |  |  |  |

of class awareness or participation so as to get their fact right about the classes they are taking. In order to sup port our hypothesis that association patterns exist with constructed for binations based upon students' answers to the fact-based questions $\mathrm{Q}, \mathrm{Q} 3, \mathrm{Q} 4, \mathrm{Q} 13, \mathrm{Q} 21$, ad Q 25 . The next step was to explore how ight question (Q18). question (Q18).
Out of eleven classes, only one instructor in one class [In structor \#1- Class \#1] had consistently lower likeabilit ratings, when students were unable to answer the factua questions correctly. They were excluded from the calculation. For the other ten classes, when the non-attentive students were excluded, the evaluation of teaching scores improved. If student evaluations scores and "attentive ness" were independent, the expectation is that 5 or 6 of the 11 classes
would have higher student evaluation scores when non-attentive students were included and the other 6 or 5 would have lower student evaluations when non-attentive students were included. Obtaining a 10 to 1 outcome from 11 tries of a $50 / 5 \emptyset$ event is possible, of course, but only 67 times in 1Ø,Øøø probable. (Chi-Square P=.Øø6656) In other words, there is both descriptive/intuitive and statistical evidence suggesting a correlation between stu-

Table 2
Results for New Survey Instrument

| Instructor | Class | Class <br> Size | Instructor's Likeability <br> Rating for the Entire Class |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | Mean | Std. Dev. |
| 1 | 1 | 29 | 2.24 | $\emptyset .98$ |
|  | 2 | 10 | 1.5 | 1.2 |
|  | 3 | 11 | 2.64 | 1.21 |
|  | 4 | 32 | 2.53 | 1.08 |
|  | 1 | 10 | 1.1 | 0.32 |
|  | 2 | 29 | 2.17 | 1.19 |
|  | 3 | 16 | 2.31 | 1.19 |
| 3 | 1 | 18 | 1.33 | 0.485 |
|  | 2 | 17 | 1.41 | 1 |
|  | 3 | 26 | 1.19 | 0.4 |
|  | 4 | 11 | 1.18 | 0.4 |

1-Strongly Agree, 2-Agree, 3-Neutral
4-Disagree, 5-Strongly Disagree

| Table 3 <br> Summary of Hypothesis Tests: |  |  |
| :---: | :---: | :---: |
| Instructor | Class | Hypothesis Test Results |
| 1 | 1 | $U=406$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=0.05$ for $n_{1}=28$ and $n_{2}=29, U_{\text {critical }}=282$ We fail to reject $H_{0}$ since $406>282$. Also, since $\mathrm{p}=1.00$ is greater than $\varnothing .05$, we fail to reject $H_{9}$. |
|  | 2 | $U=37$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=\emptyset .05$ for $n_{1}=1 \emptyset$ and $n_{2}=1 \emptyset, U_{\text {critical }}=23$ We fail to reject $H_{0}$ since $37>23$. Also, since $\mathrm{p}=\emptyset .35$ is greater than $\emptyset . \emptyset 5$, we fail to reject $H_{0}$. |
|  | 3 | $U=47$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=\emptyset .05$ for $n_{1}=1 \emptyset$ and $n_{2}=11, U_{\text {critical }}=26$ We fail to reject $H_{0}$ since $47>26$. Also, since $\mathrm{p}=\emptyset .60$ is greater than $\emptyset . \emptyset 5$, we fail to reject $H_{0}$. |
|  | 4 | $U=572.5$ <br> We fail to reject $H_{9}$ since $572.5>U_{\text {critical }}$ at $\alpha=\emptyset .05$ for $n_{1}=32$ and $n_{2}=32$. <br> Also, since $\mathrm{p}=\varnothing .42$ is greater than $\emptyset .05$, we fail to reject $H_{\sigma}$. |
| 2 | 1 | $U=39.5$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=\emptyset .05$ for $n_{1}=1 \emptyset$ and $n_{2}=1 \emptyset, U_{\text {critical }}=23$ We fail to reject $H_{0}$ since $39.5>23$. Also, since $\mathrm{p}=\emptyset .44$ is greater than $\emptyset .05$, we fail to reject $H_{\varnothing}$. |
|  | 2 | $U=362$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=0.05$ for $n_{1}=28$ and $n_{2}=29, U_{\text {critical }}=282$ We fail to reject $H_{0}$ since $362>282$. Also, since $\mathrm{p}=\varnothing .49$ is greater than $\emptyset .05$, we fail to reject $H_{0}$. |
|  | 3 | $U=121$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=\emptyset .05$ for $n_{1}=13$ and $n_{2}=16, U_{\text {critical }}=59$ We fail to reject $H_{0}$ since $121>59$. Also, since $\mathrm{p}=\emptyset .47$ is greater than $\emptyset .05$, we fail to reject $H_{6}$. |
| 3 | 1 | $U=156$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=\emptyset .05$ for $n_{1}=18$ and $n_{2}=18, U_{\text {critical }}=99$ We fail to reject $H_{0}$ since $156>99$. Also, since $\mathrm{p}=\emptyset .86$ is greater than $\emptyset .05$, we fail to reject $H_{0}$. |
|  | 2 | $U=135$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=0.05$ for $n_{1}=24$ and $n_{2}=17, U_{\text {critical }}=129$ We fail to reject $H_{0}$ since $135>129$. Also, since $\mathrm{p}=\emptyset .07$ is greater than $\emptyset .05$, we fail to reject $H_{0}$. |
|  | 3 | $U=283.5$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=\emptyset .05$ for $n_{1}=26$ and $n_{2}=26, U_{\text {critical }}=23 \emptyset$ We fail to reject $H_{0}$ since $283.5>230$. Also, since $\mathrm{p}=\emptyset .32$ is greater than $\emptyset .05$, we fail to reject $H_{\varnothing}$. |
|  | 4 | $U=61.5$ <br> Critical Value of the Mann-Whitney $U$ test at $\alpha=0.05$ for $n_{1}=12$ and $n_{2}=11, U_{\text {critical }}=33$ We fail to reject $H_{\text {s }}$ since $61.5>33$. Also, since $\mathbf{p}=\emptyset .79$ is greater than $\emptyset .05$, we fail to reject $H_{\text {. }}$. |



By excluding a student's set of responses because the student was not able to answer all six fact-based questions correctly the mean composite student evaluation score (average) for the instructor improved and the standard deviation for the class became smaller (indicating more consensus on teaching effectiveness). Apparently, the line

## STUDENT EVALUATIONS AND

## CRITICAL THINKING IMPLICATIONS

This conflict between student evaluations and student academic development has frequently had a negative impact on both academic skills and the social maturity that college graduates manifest. Self-confidence and self-respect may be seriously jeopardized. If a faculty member attempts to provide instruction that stimulates critical thinking and to construct examinations that actually measure student progress, such a faculty member will probably encounter a significant obstacle when it comes to the student evaluation process. When other variables are added to the mix such as cultural diversity, testing differences (types of tests), grades, brain preference, size of class, critical thinking differences, subject matter differences and different levels of preparation for higher education, anyone attempting to develop a student evaluation instrument that is fair and that provides valid feedback has an enormous challenge with the interaction of the numerous variables that play a role in student evaluations.
At Missouri Western State University the original evaluation instrument has indications of co-linearity or asociation patterns. For example, on question five " The instructor presents the course material clearly and understandably" the evidence indicates that if the students rate he instructor between 2.0 and 2.5 on this question the overall evaluation average will be between one and two. If the students rank the instructor 2.5 to 3.0 the evaluation average falls between 2.0 and 2.5. On the new instrument specific questions number 10 and 11 address critical thinking. Question 10 asks, to indicate your agreement with this statement: I like assignments and exam questions when the answers can be readily checked in the oook". The percentage of students that strongly agreed with the statement was $45.45 \%$ and the other five answer percentages were agree at $34.35 \%$, neutral at $17.70 \%$, diso question 10 the next question number 11 than asked the students the following. Indicate your agreement with statement: "I like assignments and exam questions whose answers allow for interpretation and creativity". The perentage of students that strongly
greed with this statement was $10.53 \%$ and the other anwers were as follows: agree $27.75 \%$, neutral $34.93 \%$, disagree $15.79 \%$, and strongly disagree $11 . \emptyset \emptyset \%$. Question $1 \emptyset$ focuses more on courses that are structured with facts and specific procedures such as finance and accounting. Question 11 more on courses that require synthesis for application. Similarly questions $14,15,16$ on whether the concepts were more interesting, valuable, and difficult did not produce any substantial deviations. However, in reviewing some of the results by subject area, type of tests, and
grades there were some differences that indicate student evaluations vary depending on the type of course.

This educational dilemma between student evaluation and critical thinking is further complicated by the hundreds of different courses offered by the typical universit that present a smorgasbord of critical thinking levels fo students depending on the nature of course materials and teaching methodologies. Historically, Bloom classified different critical thinking levels in the cognitive domain (Bloom, Engelhart, Furst, Krathwohl, 1956). These cog nitive domain classifications start with knowledge and then proceed in the following order with the difficulty in creasing in the following order: comprehension, analysis, synthesis, application, and evaluation. To expand Bloom's famous taxonomy of educational objectives, Gronlund divided Bloom's cognitive domain into instructional objectives and behavioral terms (Gronlund, 1978), which in dicates different courses frequently require different levels of critical thinking based on different levels of difficulty. Comparing one instructor with another given the many different types of courses with the different critical thinking levels and different educational objectives becomes an administrative issue. However, if the typical administrator/bureaucrat could get past student evaluation averages, student test scores, type of tests that produces differences in critical thinking then business school quality could increase. For example, the Graduate Management Ad-
mission Council for Business Schools is now testing for mission Council for Business Schools is now testing for integrative reasoning (Dammon, 2ø11), and a recent ar ticle in Business Education suggests a new rating system for business schools that focuses on quality and learning improvement (Rubin and Morrison, 2015)

Differences in testing procedures and the quality of students produce differences in student evaluations between faculty members and also between classes for a single faculty member. These differences aggravate the evaluation problem. Multiple choice exams differ from essay exams and end of chapter essays may reflect specific concepts in the chapter, but may be limited because they usually do not compare and contrast different concepts or ideas As a result of testing differences and the different type of students enrolled in each class, we find differences in student evaluations not only between classes and between instructors but also between sections of the same class for the same instructor. Although there are differences, thi research did not produce statistically different studen evaluations between courses and instructors. Current student evaluation procedures are, thus, not reliable for promotion and tenure
By adding the percentages of the newly student evaluation instrument for whether students strong agree and agree on each of the questions associated with student
evaluations by subject, type of tests, grades, size of class, major, produces additional insight on the difficulty and the complexity of interpreting student evaluations fairly. or example, question number 10, Tike assignments and exam questions " The the ansers can be readily checked tegic Management, Tax and International Finance the percentage of students favoring the question 10 was $69 \%$ percentage of students favoring the question 10 was $69 \%$ gement Business Law Principles of Finance and Busiess Statistics.

Question 11 asks students whether they like assignments and exam questions that allow for interpretation and creativity. The average percentage on question 11 for all subject areas was $4 \emptyset \%$ whereas for question 10 where the assignments and exams are tied back to the textbook the average student percentage was $77 \%$ for all subject areas.
What is interesting is the difference in percentages for the two classes of MGT 419 one class average for question 11 (assignments and exam questions allow for interpretation and creativity) was $6 \varnothing \%$ and the other class was $36 \%$. In checking the number of majors by subject the class makeup was quite different. The class that rated question 11 at $60 \%$ has 12 students with nine marketing and management majors and the class that rated question 11 at $36 \%$ had 14 students with $1 \emptyset$ of the students majoring in finance and accounting. This percentage difference indicates a brain preferences(left or right) may play a role in student evaluations.
Turning to questions 14 and 15 substantial differences exist between the strategic management classes. Question 14 asked whether "the concepts in this course were more interesting than the concepts in most other courses have taken, and question 15 asked "The concepts in this course were more aluable than concepts in most other was $60 \%$ for the marketing and management majors and was 6 for the finance and accounting majors. majors and 15 the percentage difference was $7 \emptyset \%$ for On question 15 the percentage difference was $76 \%$ for marketing and counting. However, on question 23 that asked, "The instructor stimulated my interest in this subject", the class with the marketing and manems students ranked westion 23 ank and the class with the fincse counting students ranked question 23 at $18 \%$ In short, questions 14 (interesting concepts) question 15 (concepts questions 14 (interesting concepts), questionis (concepts ed my interest) the differences were considerable and yet on question 20 which asked "it was harder to get a good on question 20 which asked it was harder to get a good difference between the two Strategic Management (MGT 419) classes: $82 \%$ compared to $81 \%$. Even though one class
had more finance and accounting students and the other class had more marketing and management majors. Then question arises whether the teaching and assignments
were different between the two classes? The answer is no In teaching Strategic Management 419 there was no dif ference in the lecturic Manage. . ference in the lectures, exams, individual case studies, and
the group case studies, and all exams and individual cas the group case studies, and all exams and individual cas
studies were graded anonymously by having the student studies were graded anonymously by having the student use an identifying mark that they selected. When the pa-
pers were handed back the students wrote their names on pers were handed back the students wrote their
the papers, and instructor recorded the grades.
For the other upper level courses International Finance and Tax the concepts were more interesting than othe courses (question 14) the percentages were respectivel $72 \%$ and $5 \emptyset \%$, but for the lower level courses Principle of Management MGT 305; Business Law, GBA 211; Principles of Finance, FIN 301; and Business Statistics, GBA $21 \emptyset$ the average was $33 \%$. On question 15 (concept in this course were more valuable than concepts in othe courses) there was a variance. Principles of Management and Business Law more right brain subjects averaged $39 \%$ whereas Tax, Principle of Finance, Business Statistics th more(quantitative and procedural subjects averaged $68 \%$
Question 16 asks whether "The concepts in this course were more difficult than concepts in most other courses I have taken". The total average for question 16 was $59 \%$, In comparison the tax course ranking was $8 \emptyset \%$. Question 20 asks whether "It was harder to get a good grade in thi tion $2 \emptyset$ for the tax course was $6 \emptyset \%$. However, the strat egy courses were ranked higher at $80 \%$ and $82 \%$, which is consistent with question 12 which indicated the strateg course required more work than other courses. Questio 23 asks the students does "The instructor stimulate my interest in the subject". The average was $55 \%$ with a range of $24 \%$ to $9 \emptyset \%$. For question 23 on whether the instruc tor stimulated my interest in the course the upper leve courses Strategic Management (two classes), Tax, and International Finance scores were $9 \emptyset \%, 18 \%$ for Strate gic Management. The $9 \emptyset \%$ class had a predominance of marketing and management majors, and the $18 \%$ clas had accounting and finance majors. For the other upper level courses Tax, and International Finance the score were respectively $80 \%$ and $83 \%$. Why the difference in the Strategy classes? To explain the difference between the two strategy classes remember one class was populat ed with $75 \%$ marketing and management majors and th other $75 \%$ finance and accounting, and the research indicates most marketing and management majors are right brain whereas finance and accounting majors are usually left brain (Krueger, 2009). . Therefore, brain preference stimulates interest in the subject matter and plays an im portant role not only in how students evaluate the course
and the instructor, but also indicates a strong connection between high student interest in the subject matter, and student learning outcomes (Bergin 1999: Frymier, Shulman, \& Houser, 1996: HIDI, 1990; Schiefele, 1991, 1996). According to Schiefele a student's subject matter interest increases learning because subject matter interest encourages student intrinsic motivation. Specific types of ests that represent specific learning strategies that correate with student interest and motivation lead to studen internalization and ownership of matenal (Dewey, 1913) These connections in turn lead to different levels of critical thinking and can produce differences student evaluation differences, but again not significant statistical differences.

Question 23 on whether the instructor stimulated my inerest in the course the lower level courses Principles of Management, Business Law, Principles of Finance and Business Statistics averaged $49 \%$. Why? The lower level classes students usually have not committed themselves to a specific major. Therefore, interest in the subject matter at this level becomes difficult to assess.

## IMPLICATIONS

The research substantiates that student evaluations have nadvertently overtime increased grades in higher educaion. This study provided evidence on how difficult it is to design a better student evaluation instrument and how to place student evaluations into a context. What we have is a conflict with student evaluations grades and the need for faculty in higher education to focus more on developing sudents. To further this development additional Strategic Management Classes were compared using different the alternative hypothesis indicated differences in grades the alternative hypothesis indicated differences in grades and teaching techniques..
For Strategic Management there are eight Essay Questions for first exam: Porter's buyer and supplier power, competitive rivalry, Deming Quality Management, Barriers to Entry, Business Strategies, Corporate Strategies, and an Econ Forecast. The second essay exam questions focus on International currency exchange rates including implications, forecasting models, Strategic Alliances and joint ventures etc., BCG Matrix, Different Organizational Structures, Company Cultures, Motivational Practices, and Global and Multinational Strategies. The nstructor's lectured centered on explaining in depth each of the eight questions, and these are the eight questions that the students are required to take notes and then write out answers for each of the eight questions for ten points. Then the instructor reviews the test questions before the students take the exam. This approach enables the student to prepare for the eight questions and out of the eight
three are selected for the test. For the Principles of Man agement course
the fifty exam questions per test for a total of four tests All the test questions were taken from the test bank, and twenty percent were ranked as easy by the test bank, and the other forty questions were split between moderate and with ten percent considered difficult. Before the exam the instructor reviewed the fifty multiple choice exam ques tions. As for the teaching methodology for the Principles of Management classes relied simply on the 125 questions per chapter and the test covered three chapters including the final. The final did not have questions over previous chapters. For teaching the textbook power point was utilized. .
What follows are the exam results for Strategic Management and Principles of Management. The first column represents the first Strategic Management essay exam average. The second column is the second test average (only two exams) and then the average percentage change between Exam one and Exam Two is the third column The Principles of Management course reports three exam scores for multiple choice exams.
The different tests between the Strategic Managemen classes and the Principle of Management classes were dif ferent. In Principle of Management classes the multiple choice test grades decrease as the course proceeded from historical information on the first exam into more ab stract concepts on subsequent exams including the final which again, was not comprehensive.
In contrast to multiple choice exams the essay approach in Strategic Management shows improvement from the firs to the second exam. In the Strategic Management classes the exam questions are handed out at the start of the semester, and the students are given points for developing their answers to the questions before they take the exam The instructor teaches to the exam questions and review one week before the exam so the students can make adjustments to their answers. By using essay tests that have an extensive writing and application approach in Strategic Management, the group student exam scores improved between the first and second exam with the grade scale a $9 \emptyset \%$ for an $\mathrm{A}, 80 \%$ for a B, $7 \emptyset \%$ for a C, $60 \%$ for a D , and $60 \%$ for a F . At the end of the semester with the individual case studies and the group case studies the group cours grade point at the end of the semester averages between 2.5 and 3.0.

However, in the Principles of Management course the multiple choice exams not only decreased with each exam, but the teacher at the end of the course had to lower th grade scale: $85 \%$ for an A, $73 \%$ for a B, $63 \%$ for a D, and $51 \%$ for an F . Even though the multiple choice exam ques-
ions are reviewed one week before each exam, the review did not produce an increase in test grades.
For the Principles of Management class course grade point average at the end of semester average was between 2.0 and 2.5 on a five point scale compared to 2.5 to 3 point for theStrategic Management classes
Why the difference in grades and student evaluation between the two courses? The upper level strategic management course that has abstract and complex concepts that have ten or more perspectives and various applications lends itself to teaching the concepts that the students have to explain, apply and then support. For the Principles of Management Course the power point presents an outline of the subject matter with little course depth and very little conceptual comparisons. The average student evaluations 2.2 and 2.6 on a five point scale and average about a half point less than the evaluations in the Strategic Managepoint less than the evaluations in the Strategic Manage-

## Conclusion

This research statistically evaluated two different student evaluation instruments. The statistical results show no differences between the use of one student evaluation instrument compared to the other student evaluation instrument, but the type of tests, grades, interest differences in the subject matter (left and right side of brain preference), course difficulty, and student work load are variables that influence the student evaluations averages.
The essay exams in Strategic Management improve from he first exam to the second exam, and the grades for case studies usually avoids any grade below a C whereas the use of test bank multiple choice questions have a detrimental effect on grades in the Principles of Management Course. The grades decrease as the course progses from exam to exam. By lowering the grade scale in Principles of Management the assumption is the instructor more than ikely avoids extreme negative student evaluations. The other play a role in how students perceive the course but the play a role in how students perceive the course, but the portane incation is the the odology associated with the subject matter. Whether the dent to and upper level critical thinking skills such as synthesis
 Ine
In the strategic management classes what is apparent the teaching techniques illustrate a system of learning that promotes academic Improvement and written about a few years ago (Stefani, 2011).

| TABLE 4 <br> Exam Results <br> MGT 419 Strategic MANAGEMENT |  |  |  |
| :---: | :---: | :---: | :---: |
| Exam 1 | Exam 2 | Percent Change |  |
| Fall 14 |  |  |  |
|  |  |  |  |
| 69.43 | 79.15 | 9.72 |  |
| 6-A | 9-A |  |  |
| 6-B | $8-\mathrm{B}$ |  |  |
| 7-C | $8-\mathrm{C}$ |  |  |
| 3-D | 5-D |  |  |
| 10-F | 2-F |  |  |
| Summer 2ø14 |  |  |  |
| 70.62 | 74.68 |  |  |
| 3-A | $4-\mathrm{A}$ |  |  |
| 2-B | 2-B |  |  |
| 6-C | 10-C |  |  |
| 6-D | D-1 |  |  |
| F-4 | F-2 <br> (attendance <br> problem) |  |  |
|  |  |  |  |

## Spring 2014

| Spring 2014 |  |  |  |
| :---: | :---: | :---: | :---: |
| 75.42 | 83.56 | 8.14 |  |
| $3-\mathrm{A}$ | $7-\mathrm{A}$ |  |  |
| $12-\mathrm{B}$ | $10-\mathrm{B}$ |  |  |
| $5-\mathrm{C}$ | $3-\mathrm{C}$ |  |  |
| 1-D | 1-D |  |  |
| $2-\mathrm{F}$ | 1-F |  |  |

## Spring 2014

| 68.84 | 74.89 | 6.04 |
| :---: | :---: | :---: |
| $3-\mathrm{A}$ | $4-\mathrm{A}$ |  |
| $5-\mathrm{B}$ | $5-\mathrm{B}$ |  |
| $3-\mathrm{C}$ | $7-\mathrm{C}$ |  |
| $4-\mathrm{D}$ | $1-\mathrm{D}$ |  |
| $3-\mathrm{F}$ | $2-\mathrm{F}$ |  |

## Fall 2013

| $7 \varnothing .33$ | 79.18 | 8.85 |
| :---: | :---: | :---: |
| $\emptyset-\mathrm{A}$ | $6-\mathrm{A}$ |  |
| $7-\mathrm{B}$ | $11-\mathrm{B}$ |  |
| $1 \varnothing-\mathrm{C}$ | $4-\mathrm{C}$ |  |
| $4-\mathrm{D}$ | $2-\mathrm{D}$ |  |
| $6-\mathrm{F}$ | $4-\mathrm{F}$ |  |


| Table 4 <br> Exam Results <br> mGT 419 Strategic Management |  |  |
| :---: | :---: | :---: |
| Exam 1 | Exam 2 | Percent Change |
| Summer 2013 |  |  |
| 72.50 | 84.30 | 11.8 |
| 4-A | 4-A |  |
| 3-B | 5-B |  |
| 2-D | Ø-D |  |
| 4-F | Ø-F |  |
| Spring 2013 Day Class |  |  |
| 77.42 | 75.54 | -1.88 |
| 1-A | 1-A |  |
| 11-B | 10-B |  |
| 7-C | 4-C |  |
| 5-D | D-8 |  |
| Ø-F | 3-F |  |
| Spring 2013 Evening Class |  |  |
| 70.17 | 81.38 | 11.21 |
| 2-A | 7-A |  |
| 8-B | 10-B |  |
| $9-\mathrm{C}$ | $7-\mathrm{C}$ |  |
| 2-D | 4-D |  |
| 9-F | 1-F |  |

What this research emphasizes is the type of subject matter determines the type of testing. Courses that are specific and procedural can be taught using multiple choice exams. For example, in a 1994 journal article it was found that in lower level micro and macroeconomics courses, there was not difference between essay exams and multiple choice exams (Walstad and Becker, 1994). More recent research proposes constructed response questions in addition to only multiple choice questions for computer modeling and computer language programing (Simkin and Kuechler, 2005). Further research supports the student preference for multiple choice exams, but also, demonstrates that when students are prepared for the essay exam they appreciated the fairness and validity of the essay exam (Parmenter, 2øø9).
Courses that lean toward conceptual abstraction require a higher critical thinking approach such as synthesis, where the student is required to compare and contrast the differ-

| TABLE 5 <br> ExAM Results <br> Principles OF MANAGEMENT |  |  |
| :---: | :---: | :---: |
| Exam 1 | Exam 3 | Final |
| Spring 14 |  |  |
| 72.03 | 72.08 | 73.67 |
| A- 0 | A-3 |  |
| B-2 | B-4 |  |
| C-12 | C-8 |  |
| D-8 | D-7 |  |
| F-3 | F-3 |  |

## Spring 2012

| 79.2 | 66.60 | 71.74 |
| :---: | :---: | :---: |
| A-3 | A- |  |
| B-8 | B-6 |  |
| C-9 | C-10 |  |
| D-7 | D-10 |  |
| F- $\varnothing$ | F-5 |  |

## Spring 2012

| Spring 2012 |  |  |
| :---: | :---: | :---: |
| 79.05 | 71.45 | 71.88 |
| A-4 | A-2 |  |
| B-13 | B-7 |  |
| C-8 | C-8 |  |
| D-8 | D-1 |  |
| F- $\varnothing$ | F-5 |  |
| Spring 2011 |  |  |
| 74.6 | 71.0 | 77.88 |
| A-4 | A-1 |  |
| B-13 | B-7 |  |
| C-8 | C-5 |  |
| D-10 | D-8 |  |
| F-3 | F-4 |  |

ent conceptual alternatives and select the best alternativ and support the alternative.
The research on comparing the two student evaluation instruments shows no statistical difference between each instrument, but illustrates numerous variables that can af fect student evaluations scores such type of test, interest in he subject matter, brain preference, grades, class size, etc. However, the research also indicates that matching teach
ing and learning methodology is far more important than the emphasis that has been placed on student evaluations. A recent article on faculty development suggested different assessment procedures for faculty that focuses on aca demic improvement (Fink, 2ø13).

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# A "Quick \& Dirty" Strategic Audit 

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#### Abstract

In teaching Strategic Management, it is imperative that students first learn how to audit the firm before they begin analysis, planning and implementation. Unfortunately this is a step often overlooked. Without a complete and up to date audit, any analysis conducted would have questionable validity and reliability.


This report focuses on an instructional tool that faculty can utilize to guide students through a strategic audit of a company. The objective in auditing the organization is to describe the firm in terms of its current position in the industry, its strategy, structure, and performance. This paper describes the Company Profile Sheet and explains how it can be an invaluable tool for the students to understand the company under review and the strategic management concepts.

## INTRODUCTION

In looking at the nature of strategy, organizations, and strategic thinking, the field is:

- complex, messy and ambiguous;
- the stage in which strategic managers must perform is in a constant state of change; and,
- there are no universally accepted right answerseverything we do in managing strategically is contingent upon reality (environment), feasibility (resources) and desirability (goals).
Even experienced managers can become overwhelmed with the complexity and dynamic nature of the variables that must be considered in making, implementing, and managing strategic decisions. Imagine how hard it is to stay fresh, creative, visionary and focused on the future when the present is so demanding. As a result, much work in the area has focused on the strategic management process and the development of tools to help us get our arms around "the beast."

This paper focuses on an instructional tool to help students understand the elements that go into looking at a firm strategically. This template, the "Company Profile Sheet", guides the student through the preliminary process of conducting the strategic management audit.

## THE STRATEGIC AUDIT

The objective in auditing the organization is to describe the firm in terms of its current position relative to its overall plans, configurations, and assets.

Strategy (plans and processes) looks at what the firm does and how it does it.
Structure (configurations) looks at how the organization integrates the parts.
Performance (assets) looks at the outputs.
In developing the template I thought about what students need to know to conduct an effective and efficient strategic audit. My objective in developing the Company Profile Sheet was to come up with a one page strategic audit that would cover the key elements that influence strategic behavior and decisions.

To plan for the future you need a baseline in the presentlike a doctor taking a patient history, a strategist needs to understand the current position of the firm prior to analyzing alternatives. Three areas led to the development of the Company Profile Sheet: lack of understanding of strategic terminology; inconsistent operational definitions and metrics to measure those concepts; and a consistent platform to conduct comparative analysis, both longitudinal and cross-sectional.

## terminology

Strategic Management is usually taken at the end of the program of study in business-the capstone experience. Although students taking this course have been exposed to the basic concepts of business in their core courses (Management, Accounting, Finance, Marketing, Economics, Information Systems), their ability to apply those concepts in an integrative way into a company study is limited. Because of the dynamic and complex nature of the field of strategy there are many concepts and variables students must consider in conducting a strategic audit of a firm. Exposure to such concepts as company demographicssector, trading, company type, industry classification, distribution areas tend to be abstract concepts, not grounded in application. Strategic concepts including corporate/ business/functional level strategies, structural forms, and process strategies tend to be new variables to students, covered superficially in earlier courses but forgotten. Performance indicators including an ability to really look at balance sheets, income statements and ratios, analyzed and memorized for tests in earlier courses, have long been put aside as unimportant.
Additionally, students tend to have been exposed to text cases, where data is available in a concise, problem specific context. Reality is not written like a textbook case. Askng students to learn to pull current data from real company documents like the annual reports and 10 k may be a new experience for them.

## OPERATIONAL DEFINITIONS AND METRICS

It is one thing to be exposed to the concepts-it is another to understand the metrics required to operationalize those concepts. Most Strategic Management texts give theoretical definitions of terminology. My objective in developing the template with definitional instructions was to give the students a guide with operational metrics for each of the variables under audit.

## CONSISTENT PLATFORM

The template provides a consistent platform for conducting a strategic audit.

- It serves as a map that guides the student through the key elements of the audit
- It provides an integrative approach to strategic audit versus disjointed presentation of concepts.
- It provides the ability to examine not only a single company, but to conduct longitudinal and crosssectional company comparisons using an integrative template for data collection.
- It provides a foundation for more in-depth and qualitative narratives of strategy.
- It serves as a complement to case analysis.


## THE COMPANY PROFILE SHEET

The Company Profile Sheet, Appendix A, provides quick and dirty" strategic snap shot of the firm. The com pany profile sheet is divided into three primary section and is composed of 34 questions. Primary data can cove the most current year, but to really understand strategic change, it is good to look at data over several years.
The first section (items 1-1ø) includes general information on the firm: its name, address, phone number, trading name/ symbol/ markets, industry classification, date founded/ incorporated/ public, sector, industry type, dis tribution areas, key subsidiaries, outlets, and employees.
The second section of template is Strategy, Structure in formation, items 11-18. Once you have collected general demographic data on the firm, you can begin to dig deeper into the strategy and structural configurations: busines description, identifiable businesses, strategy of growth classification (single business or multi), competitive strat egy, primary markets/ products/ brands, integration (ver tical or horizontal), process of growth classification, and structure.
The third section of the profile includes performanc information (items 19-34). Taking information from the income statement, balance sheet and key ratios this provides a quick look into financial standing of the firm. Per formance looks at the outputs. A strategic manager must is going on in the company. It is critical that the studen learn to appreciate and "love" the numbers in order to develop effective strategy.

## DATA COLLECTION

Guiding students in data collection is the first step in the strategic audit process. Begin with documentary publica tions and self-reported firm information. If the firm under investigation is traded publically, have your student begin their research by reviewing the documents filed with the SEC-the annual report, the 10 K , and proxy state ments. Original company documents provide the cleanest information on the firm, and the pictures, letters, and nar ratives provide some insight into the company character values and image. The company website and investor pre sentations provide essential information to understand ing the company strategy, goals and performance. The company profile sheet can also help the students to focu interview questions when collecting primary data.


On the first day of class I give the Company Profile Sheet team. At this point students discover they "knew more along with the instructions to the students. I assign a than they thought they knew" and they have begun to specific company to audit, so all students are working on learn how to draw information from real company docthe same case. (I refer to "real company analysis" as "live" uments. At this point students can begin collecting the cases). I usually pick a publically held firm where on-line data for their individual company reports on firms they
access to the Annual Report/10K is available. Their asaccess to the Annual Report/10K is available. Their as- chose. Over the next month together we cover line by line signment is to complete the template as much as they can the concepts in the Company Profile Sheet. By the tim
 he material in class. Mis gives a baseline of what they currencly knd Wive them time to compare their work and again complete the assignment as much as they can as a
covered most of the concepts in Strategic Management corporate, business, and functional level strategy.

I recommend that students be consistent in how they present data from a strategic perspective. Strategists read left to right, so it makes sense to present the data in that format using annul data. When students mix quaterly and an ualized data, everything gets confused. Another obser vation is that students have a hard time getting the units n the performance measures correct and consistent. More fen I would like to admit they think the compar evenues are in the trillions!

Appendix B includes the instructions to guide the students in collecting the data and filling out the sheet, item by item. Upon completion of the data collection in the template, your students will have created a one page, indepth strategic audit of the firm.

## SUMMARY

Completing the Company Profile Sheet is the first step in he strategic audit and provides a "quick and dirty" strategic snapshot of the firm. It highlights general company information, strategy and structure information, and performance information on one concise and integrated page. Page two of the sheet provides additional information on the company description, a breakout of its strategic segments including revenue and operating income by segment, and structure in support of the classifications on page 1 . This sheet can be an extremely effective tool in helping the student in a strategic management course, or a business person, to get their arms around the beast we
call Strategic Management, and can serve as a first step in conducting a strategic analysis of the firm
have found using the Company Profile Sheet assignment helps the students in their final term

- to be exposed to real companies, with real data, in real time;
- to understand how to search out data on real companies using documents that are readily available outside of a textbook and outside of the university resources;
- to improve their confidence about what they have really learned in their program of study;
- to help them understand the integrative nature of the concepts;
- to establish meaningful discussion of strategy and business based on consistent terminology and operational metrics versus anecdotal stories;
- to collect data on companies they are interviewing or work with-and,
- to understand some key questions to ask when considering a potential company opportunity.

I have found using the Company Profile Sheet assignment helps the faculty

- structure class discussions using the template as foundation for teaching strategic concepts;
- makes it easier to evaluate student work because it follows a consistent, standardized format;
- helps ensure that key concepts are covered and not forgotten;
- highlights the importance of doing a critical strate gic audit prior to analysis and planning.
- Also, I have each student pick a different company to audit and as a result, I am exposed to many new and different firms I would not normally review each term.
- The template could also serve as a research platform for data collection for faculty conducting longitudinal and/or cross sectional company analysis.
A completed sample Company Profile Sheet for Time Warner, Inc. is included in Appendix C.


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Time Warner, Inc. Organization Chart. http://www theofficialboard.com/org-chart/time-warner (May 5, 2ø15).

## APPENDIX A

## Company Profile Sheet


i. bUSINESS Description
I. StRategy -sEgient information (Revenue; Operating Income by Segment)

| ${ }_{20 \times \times(n-1)}$ |  |  |  | Revenues/Operating Income | $20 \times \mathrm{X}(\mathrm{m})$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| S000XXX Rev | \%Total Rev | s000xxXOp Inc | \% Op l Income | ${ }_{\text {(by segment }}$ | S000xXX Rev | \%Total Rev | soooxxXop Inc | \%opplacme |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

III. STRUCTURE- Draw it. Include position, tities and names Year 20XXn

## N. Finsancials: Include latest Income Statemen \& Balance Shee





## APPENDIX B

## Company Profile Sheet Instructions

The Company Profile Sheet, Appendix A, provides a "quick and dirty" strategic snap shot of the firm. The bjective in completing the company profile sheet is to briefly describe the firm in terms of its overall strategy, structure, and performance. Data collection is the first step in the strategic audit process. Begin with documentary publications and self-reported firm informaion. If the firm under investigation is traded publicly, begin your research by reviewing the documents filed with the SEC---the annual report, the 10K, and proxy satements. Original conpa cleanest information on the firm, and the pictures, letters, and narratives provide some insight into the company character and whe. These in o anabis upon request from the company, in most universiy be retrieved on man on-line databases

## GENERAL INFORMATION:

1. Firm Name, Website, Email, Address, Telephone Number

As you begin your research it is very important to make sure you have the correct firm name. Many firms have ames that are very similar---for example, Coca Cola Company, Coca Cola Enterprises, Coca Cola Bottling Company, Coca Cola USA. However, each represents distinctly different company unit. Make sure that you are collecting data on the right system.

## 2. Trading Name/Ticker Symbol/Trading

Information on the trading activity of the firm can be useful in your research. Begin by finding the trading name, ticker symbol and markets. These are not always intuitively derived, i.e. the Coca Cola Company ticker symbol is KO. It is important to understand where the firm stock is traded. Domestic trading markets are usually listed on the front page of the $1 \varnothing \mathrm{~K}$, as well as the last page of the Annual Report. International trading markets may be more difficult to track down. However, if they are not listed in the Annual Report, call Invesfor Relations at the company and ask if they are traded on any international exchanges. Brokerage firms can also be helpful in securing this information, as well as providing summary information of firm trading activity, future projections, and industry forecasts.

## 3. SIC/NAICS Numbers

The SIC (Standard Industrial Classification) and NAICS (North American Industry Classification System) code provide the key to securing information on the industrie within which the firm competes. Developed by the gov ernment to aid in filing the multitude of information collects, the SIC/NAICS have become the standard cla sification scheme for individual company, and in its aggre gate form, industry information. Three or four digit codes in most cases will be the most useful in collecting indus try information. However, by decreasing the digits we can broaden the industry classification, by increasing the digits the researcher can narrow and focus the industry. For example, SIC " 20 " is a classification for food/kindred prod drinks. Descriptions of the SIC/NAICS ades and thei drinks. Descriptions of the SIC/NAICS codes and their use can be found at http://siccode.com/en

Using SIC/NAICS classifications will facilitate your in dustry research. However, it should be undertaken with a grain of salt. Note: multi-business companies are not re quired to separate data fully by segment. Therefore, much data collected under an individual SIC/NAICS number will really be an aggregate of company data across all of it business units.

## 4. Sector: (Manufacturing; Service (Includes

 Retail, Wholesale, Distribution); Mining/Oil \& Gas Combined)Sector refers to economic market classification, and is spe cific to an industry. Therefore, multi-business firms oper aring several industres will require sector classification breakdowns across each business. Sector is used as a basic proxy for economic and market structure at both the in dustry and firm level. It is assumed that manufacturing firms, as a group, have certain similar economic/market properties---properties that differ from service firms and /or mining/oil and gas.
Classification by sector is important in understandin both the strategic resource allocation and socio-technical issues that will arise within the business unit. It should be noted that same sector firms in different industries would be more similar strategically, than different sector firms same industry.

## 5. Date Founded/ Incorporated/ (Private/Public)

Noting the date founded, incorporated, and public give the investigator some insight into the firm's history, availability and relative reliability of data. Date founded suggests the relative age of the enterprise. Date incorporated
helps the researcher understand strategic changes in the firm structure. It is especially important to note dates forms (i.e. holding company) in order to efficiently be able to find information on the firm. The Securities and Exhange Commission requires certain data filings. Once change Commission requires certain data filings. Once he firm goes public these filings are free and openly spectus, annual report, 10 k , proxy statements, quarterly reports, as well as numerous other required reports. This availability of data is one of the reasons that public companies are scrutinized in so much detail, while activities of privately held companies, although they comprise the majority of the firms in the world, are less well documented. As a result of both the filing requirements and this ed. As a result of both the filing requirements and this
increased scrutiny, data available on public companies is ncreased scrutiny, data available on public companies is to such extensive external review,

## 6. Industry Type (Science Based; Non Science)

The industry type is a proxy for level of technology at the organization-environment interface. Controlling for sci-ence-based versus non-science based industry type appears to be a better predictor of strategy, structure, and perforUse of industry types as a proxy for level of technology is based upon the assumption that firms operating in high technology science based industries will exhibit a higher level and greater variety and magnitude of product and process technological change and innovation than firms in non-science based industries, product lifecycles will be different, as well as resource allocations.
A firm is generally classified as Science based if it operated in the following categories: bio-technology and pharmaceuticals, aircraft \& spacecraft, medical, precision \&
optical instruments, radio, television \& communication optical instruments, radio, television \& communication equipment office, accounting \& computing machinery, electrical machinery \& apparatus, motor vehicles, trailers $\alpha$ semi-trailers, railroad \& transport equipment, chemical \& chemical products, machinery \& equipment. NAICS ified in Figure 1. However, it is imperative that you use your judgment in classifying your segments as yogment your judgment in classifying your segments as segments that may not appear to be science based may have a significant science based component. For a quick designation, probably indicates the firm is "science based" Firms opproting in all other industries are classified as Non Science based.

## 7. Distribution Areas (Local; Regional; National;

 International)Strategic complexity increases significantly as firms diversify their distribution areas from local to regional to national to international. Government, laws, regulations, monetary policies, politics, access, economics, busines systems, structure, markets, social norms, cultural dynamics, language, geography, labor, money, transportation/communication, contracts, market research, ad vertising, expectations --- among many others--- change from county to county, country to country. As the firm kets wheally increases its differentiation among the mar integration mechanisms within the strategy machine--th organization--to cope with these different parts. This will impact resource allocations across the system, the neces sity to effectively boundary scan, and the requirement of efficiently and effectively managing the strategic informa tion system.

## 8. Key Subsidiaries

A subsidiary is defined as a company in which another corporation called the "parent company" owns more than $50 \%$ of the voting shares.
Understanding the strategy and structure of the firm requires an understanding of the critical parts of the system, and the key subsidiaries of the firm help define thes boundaries. The firm subsidiaries will usually be listed near the last page of the annual report/ 10 k with the infor mation regarding headquarters, key officers, and busines units. As you list the key subsidiaries, pay particular atten tion to how they are named and grouped. Also, be sens tive to whether the subsidiary is wholly owned by the par ent firm. Some subsidiaries may be only partially owned by the firm under audit and this will directly influence the amount of control the firm will have over the subsidiary For reporting purposes, firms are only required to list as subsidiaries, those units in which they maintain at least majority (usually $7 \emptyset \%$ ) ownership position. It should also be noted that subsidiaries, if held as autonomous units, might be traded publically independent of the parent firm

## 9. Number Of Outlets

In profiling the firm it will be helpful to know the number of outlets by type, retail distribution and /or manufactur ing that the firm has established. The number of outlets can be a good indicator of segment and/or brand growth within the company. Therefore, longitudinal comparison can prove useful. In looking at growth in number of outlets over a period of time, be aware that the numbe

## Figure 1

## NAICS CODES THAT CONSTITUTE HIGH-TECHNOLOGY INDUSTRIES

http://www.nsf.gov/statistics/seind14/index.cfm/chapter-8/c8s6o55.htm

| NAICS codes that consititute high-technology industries |  |  |
| :---: | :---: | :---: |
| 2002 NAICS code | 2007 NAICS code | Industy |
| ${ }_{1131}$ | ${ }^{1131}$ | Timber track operations |
| ${ }_{1111}^{1132}$ | ${ }^{1132}$ | Forest turseries and gathering of forest products |
| 2111 | ${ }_{2211}^{211}$ | Oil and gas extraction $\begin{aligned} & \text { Electic cower generatio, transmission, and distrsibution }\end{aligned}$ |
| ${ }_{3211}^{2211}$ | ${ }_{3241}^{2211}$ | Electric power generation, transmission, and distribution |
| 3251 | 3251 | Basic chemical manufacturing |
| 3252 | 3252 | Resin, syytheicic rubber, and artificial synthetic fibers and filaments manufacturing |
|  | 3253 | Pesticice, ferriizer, and other agriculural chemical manufacturing |
| 3254 | 3254 | Pharmaceutical and medicine manutacturing |
| 3255 3259 | 3255 | Paint, coating, and achesive manutacturing |
| 3259 332 | 3259 | Oner chemical product and preparation manufacturing |
| ${ }_{3333}$ | ${ }_{3333}$ | Commercial and senvico industry machinery manutacturg |
| ${ }_{3336}$ | ${ }_{3336}$ | Engine, turbine, and power transmission equipment manufacturing |
| 3339 | 3339 | Other general purpose machinery manufacturing |
| ${ }^{3341}$ | 3341 | Computer and peripheral equipment manufacturing |
| $\begin{array}{r}3342 \\ 343 \\ \hline\end{array}$ | ${ }_{3343}$ | Communications equipment manutacturing |
| 3344 | 3344 | Semiconductior and other electronic component manufacturing |
| ${ }^{3345}$ | 3345 | Navigational, measuring, electromedical, and control instruments manufacturing |
| ${ }_{3356}^{3346}$ | -3346 | Mantuacturing and reproducing magnetic and optical media |
| 3364 | ${ }_{3364}$ | Aerospace procuuct and parts manufacturing |
| ${ }^{3369}$ | 3369 | Other transportaion equipment manufacturing |
| ${ }_{4}^{4234}$ | ${ }_{4}^{4234}$ | Professional and commercial equipment and supplies, merchant wholesalers |
| 4862 | 4862 | Pipeline transportation of natural gas |
| ${ }_{5112}^{4899}$ | ${ }_{5112}^{4899}$ | Other pipeline transporation |
| 5161 | na | Internet publishing and broadcasting |
| ${ }_{5171}$ | ${ }_{51711}^{5191}$ | Interet publishing and broadcassing and Web search portals |
| 5172 | 5172 | Wireless telecommunications carriers (except satellite) |
| 5173 | ${ }_{\text {na }}^{\text {ni }}$ | Telecommunications resellers |
| 5179 | 5179 | Other telecommunications |
| $\begin{array}{r}5181 \\ 5182 \\ \hline 1\end{array}$ | ${ }_{5182}^{\text {na }}$ | Internet Sesvice providers and Web search porals |
| 5211 | 5211 | Monetary authorities, central bank |
| 5232 | 5232 | Securities and commodity exchanges |
| 5413 5415 | 5413 | Architectural, engineering, and related senvices |
| ${ }_{5416}$ | 5416 | Manpueiementit scienienific, and technical consustuting services |
| 5417 5511 | ${ }_{5511} 5$ | Scienificic research and development sevices |
| ${ }_{5612} 511$ | ${ }_{5611}^{5511}$ | Managemenent of companies and enterprises Facilies supoot senices |
| 5612 | 5612 561312 | Facilieies support senices Executive earch sevicices |
| na ${ }_{8112}$ | ${ }_{8112}^{561312}$ | Executive search services Electronic and precision equipment repair and maintenance |

NAICS = North American Industry Classification System.
NoTES: Data on high-tech industries for 2008 and earilier years were complied using the 2002 NAICS codes. Data for 2009 and 2010 were compiled using the 2007 NAlCS
codes.
of outlets reported historically will be revised to reflect ooth internal growth and acquisition activity. If you want a true picture of growth, it will be necessary to go back on a year-to-year basis to collect the data, segmented by type of growth.

## 10. Number Of Full-Time Employees

For publically held firms, the number of full-time employces can be found in the 10 k document in a special category entitled "employees". This section also includes additional human resource management information including spe-
cial contracts, provisions, and unionization. The numbe of employees can give the researcher some measure of growth within the firm. It can also be very misleading, if not evaluated in light of the strategy of the firm overall. When looking at the number of employees, it is importan to note the type and nature of business segments in which the firm operates, and the changes that have taken place over the period of evaluation. The relationship of "labor intensive" to "capital intensive" technological processes across segments is critical to understanding the relationship between the number of employees and revenues for
instance. Consider also if the firm processes include Fabrication versus Assembly components.

| Figure 2 |  |
| :--- | :--- |
| Resource Intensity And Technology |  |
| Resource Intensity | Technology |
| High Labor | Customized, Job Shop |
|  | Batch, Mass |
| High Capital | Process |

Two companies that appear on the surface to be similar but are quite different in terms of resource intensity and technological processes are the Coca Cola Company $(1993,2015)$ and PepsiCo, Inc. $(1993,2015)$. Why is there such a significant difference in number of employees? Take a look at the segment revenues across the two companies. Included is the data from both 1993 when restaurants were PepsiCo's largest segment as well as the 2015
data. Both years clearly highlight the differences between the two companies strategically.

As number of employees is a critical variable in evaluating the economic impact of a company, and in turn its political and social clout, firms will want to reflect the number of employees in the most favorable light. Be careful inter preting number of employees based on narratives present ed. For example, a company may state in its annual repor that it "employs worldwide, across its brands 25Ø,Øøø however, its 10 K states number of full-time employees are $39, \emptyset \emptyset \emptyset$. This appears to be a significant deviation. However, note the wording---the larger number reflects employees of the brand, including all employees of franchisees. These represent indirect, not direct employees of the company. The number of employees may also be manipulated to indicate both full and part-time employees. Make sure you are pulling the appropriate number that reflects your objective with the greatest validity. Also, note that as you evaluate changes over time, it is important to reflect changes in employees relative to changes in strategy.

| Figure 3Coca Cola Company versus Pepsico 1993/2015 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |
|  | 1993 | 2015 | 1993 | 2015 |
| Net Revenues (\$øøø,øøø) | \$13,963 | \$44,294 | \$25,021 | \$63,056 |
| Full time employees | 34,øøø | 132,2øø | 423,øøø | 263,øøø |
| Segments (\%) | Soft drinks 88\% | Concentrate ops 38\% | Beverages 34\% | Frito Lay NA 23\% |
|  | Foods 12\% | Finished prod ops 62\% | Snack Food 28\% | Quaker Foods NA 4\% |
|  |  |  | Restaurants 38\% | Latin Am 13\% |
|  |  |  |  | North Am Bev 33\% |
|  |  |  |  | Europe/SubSah/Af 17\% |
|  |  |  |  | Asia/MidE/NAf 1ø\% |
| Gross Profit | \$ 8,803 | \$26,812 | \$13,075 | \$34,672 |
| Operating income | \$ 3,108 | \$ 8,728 | \$ 2,907 | \$ 8,353 |
| Net Income | \$ 2,176 | \$ 7,351 | \$ 1,588 | \$ 5,452 |

## STRATEGY \& STRUCTURE

The second area of evaluation is Strategy, Structure information, items 11-18.
Once you have collected general demographic data on the firm, you can begin to dig deeper into the strategy and structural configurations.

## 11. Business Description

Here you want a brief general description of the organization. You may include a more detailed description on page 2 of the Profile Sheet (Appendix A). As part of describng the business, we look at the Corporate, Business, and Functional Level strategies.

## 12. Identifiable Businesses: (Corporate Level)

 (Status-Quo, Growth, Retrenchment, Liquidation)Part I, first paragraph of the $1 \emptyset \mathrm{k}$ usually gives a concise description of the firm. This is followed by descriptive segment information. Segment information can also be found in the financial disclosure section of the Annual Report/10K. Companies operating in more than one business segment are required to report revenues and certain operating data by segment. The segments identieported in 3 Identification of critical business sers ments is the first step in evaluating corporate level strategy: in answering the key corporate question---What busi(s) has (pat) dos (prest), or stould (futre) ness (es) has (past),does (present), or should (future) the firm operate?

Several points should be noted:

- as stated, the organization itself and its boundaries are merely a conceptual construct;
- the measurements are not precise, nor do the represent an absolute criterion;
- selection of the SIC/NAICS category and the specificity (i.e. 2 digit code versus 6 digit code) will directly influence the way you classify the strategic business units;
- as movements toward both vertical and horizontal integration become fully institutionalized into the corporate level strategy of the firm the perception of the SIC/NAICS category will broaden and a firm that appeared to have multi-business related units will now appear to be a fully integrated single business firm with multiple diversified product market lines.
Single Business versus Multi-Business? Remember you inductive theory:
If it looks like a duck, walks like a duck, and quacks like a duck---even though it may not specifically meet the nor mative definitions presented for a duck, maybe you should evaluate it more fully. Just make sure and substantiate your classifications so that when asked how you arrived at your conclusions you have the data available to support your position.
The four basic corporate level strategies are: status quo growth, retrenchment, and liquidation.


## 13. Strategy Of Growth

Strategy of Growth is a representative measurement and classification of the firm's overall commitment to growth through diversity at the macro organization level.

Figure 4
Corporate, Business, and Functional Level Strategies



Rumelt (1974) developed classifications among the categories using the specialization and relatedness ratio calculations.
Specialization Ratio (SR): The specialization ratio is the primary measure of diversity and is defined as the proportion of a firm's revenues attributable to its largest single strategic business unit. A single business unit is the set of activities associated with the production and marketing of a single product/service or a line of closely related products/services. Included within a business unit are all products or product lines that require close coordination or which share important resources. In deciding whether two product-market activities are part of the same business unit or not, it is helpful to ask this question: "Would a major change in pricing, manufacturing processes, technology, materials used, etc., in one of these areas have a strong effect on the operations in the other area?" If not, strong effect on the operations in the other area? If not,
the two-product-market activities are separate and not part of the same business unit.
Relatedness Ratio (RR): The relatedness ratio is the proportion of a firm's revenues that are attributable to the largest group of businesses that are related in some way to
one another. A business is part of a group of "somehow re lated businesses" as long as it is tangibly related to at least one other business in the group. The operationalization of the classifications are shown in Figure 6.

## 14.Competitive Strategy: (Business Level) (Attack, Defend, Retreat, Flank)

Business Level strategy addresses the question: How does the company compete? This question is industry segment specific and must be answered for each of the individual business segments in which the company operates. It should be noted that a firm might follow different com petitive strategies in each of its different business seg ments.
As a first step in defining the business level strategy for the segment, look at the relationship between your internal strengths \& weaknesses, and external opportunities \& threats (SWOT). There are four basic competitive strategies: attack, defend, retreat, and flank.
Once the overall business level strategy is determined than you want to look at the generic strategies within the segment relative to the product and the market.

## Figure 6

| Figure 6 <br> Single Business- Multi-Business classification system |  |  |
| :---: | :---: | :---: |
|  | Classification | Definition |
| 1.Single Business$7 \emptyset \%-1 \emptyset \emptyset \%$ | 1.1 Single line <br> Firms with SR between .95 and 1.0 | Firms that grow by the expansion of one main product/market line so that at least $95 \%$ of net revenues lie within this singe product/ market business area. |
|  | 1.2 Dominant <br> Firms with SR between .7 and 95 | Firms which grow primarily by the expansion of one main product line but which in addition have added secondary business lines making up to $3 \emptyset \%$ or less of the total sales volume. These secondary activities can be related to the primary activity or can be unrelated. |
| 2.Multi- <br> Business <br> $<7 \emptyset \%$ | 2.3 Related <br> Firms with SR less than .7, and RR between .7 and 1.0 <br> These may also be referred to as Concentric | Firms which grow by expansion by means of entry into related product /market businesses, by the use of a related technology, by related vertical activities, or by some combination of these so that no one business segment accounts for $7 \emptyset \%$ of the net revenues. |
|  | 2.4 Unrelated <br> Firms with SR less than .7, and RR less than 7 <br> These may also be referred to as conglomerate | Firms which grow by expansion into new markets and new technologies unrelated to the original product /market business segment such that no one segment accounts for $7 \varnothing \%$ of net revenues. |



Porter (1985) defines the generic competitive strategies in terms of competitive scope and advantage. Porter defined two basic types of competitive advantage a firm can possess to establish its distinctive competencies: low cost or
differentiation. These combine with the "scope" of a firm"s differentiation. These combine with the "scope" of a firm's operations (the range of market segments targeted) to produce "three generic strategies for achieving above average performance in an industry: cost leadership, differentia-
tion, and focus" (namely narrow focus). To Porter, firms tion, and focus" (namely narrow focus). To Porter, firms
that wish to gain competitive advantage must "make a that wish to gain competitive advantage must "make a
choice" among these: "being 'all things to all people" is hoice among these: "being all things to all people is a recipe for strategic mediocrity and below-average performance A firm that is stuck in the middle, engagng in each generic strategy but failng to achieve any of damentally distinct about its business in the marketplace damentally distinct about its business in the marketplace as perceived by its customers. Looking at customer type,
Business to Business/Business to Consumer, can also be aseful. useful.

## 15. Primary Markets-Primary Products/ Brands/

## Patents/ Copyrights/ Trademarks/ Registrations

Following item 14, primary markets and products are segment specific questions. Markets may include geographic,

| Business Level: Product AND MARKEt Strategies |  |  |  |
| :--- | :--- | :--- | :--- |
|  | Competitive Advantage |  |  |
|  | Market/Advantage |  |  |
| Competitive | Broad Target | Low Cost | Differentiation |
| Scope | Narrow Target | Cost Focus | Differentiation |

customer type, or some combination. Understanding the primary market segments and product/brand components of strategy helps in understanding relative competi tive positioning.

Also important, are the critical registrations that give a company "proprietary rights over a technology, product process or symbol. These can serve as market barriers to potential competitors. It is also important to note the are over which these proprietary rights are enforceable. Does the company have the local, state, national or international rights to use of a name or trademark?

## 16. Integration: Vertical/ Horizontal

The strategist must understand the degree and nature of vertical and horizontal integration strategies within and across the industry segments and sectors. A commodity is a product that is purely substitutable with no differentiat ing value added components.
Vertical integration is defined as extending the value added chain from the commodity to the end consumer---getting as close to the ultimate customer as possible. Forward vertical integration is moving the segment from where it moving the firm back towards the commodities required in fabrication.
Horizontal integration is extending the firm's market share with related or concentric products/ businesses. This may include buying out key competitors.

## 17. Process Of Growth: Internal Development Or External

 ExternalFrom a strategic perspective, interest is not only in how businesses grow in terms of the strategic content, but also the process or method through which firms attain a cer tain strategy. Firms that grow and diversify through a pro cess of internal investrent and re-inves inputs to support outputs of the firm reenter the system as inputs to support
growth, are classified as utilizing an internal development growth, are classified as utilizing an internal developmen process of growth.

Firms which show a propensity to grow and diversify by process strategies which require going outside the pereived organizational boundaries including acquisition, nergers, joint ventures, and strategic alliances among thers are classified as employing an external process of growth.
n terms of complexity, utilizing a process strategy which requires going outside of the organizational boundaries to secure resources for survival and growth is much more complex than a strategy which utilizes a resource base internal to the firm. The level of differentiation introduced into the firm increases with the degree of external intervention. Strategic alliances are relatively limited in impact and usually contractual in nature. Joint ventures require more negotiation, but boundaries across the systems are usually well defined and limited in project scope, nature, and duration. The waters get much fuzzier and much more strategically and structurally complex with mergers and acquisitions. Negotiated contracts serve to outline how the new company or unit will be governed. It is important to know if the firm under evaluation is preconditioned to internal or external process of growth as this can impact the alternatives available.

## 18. Structure

Structure looks at how the organization integrates the parts. The organization represents the strategy machine, the corpus that both creates and executes the strategy. The structural configuration of the organization directly inluences how well these functions are performed.
The DNA of formal organizations is authority, the right to command, initiate actions and make decisions. Authority is built into jobs-jobs that have two dimensions: scope and depth. Jobs are groups of combined tasks. Scope represents the number and variety of tasks included in a specific job; depth-the degree of discretion or authority an individual worker can exercise over his or her job. Jobs are combined into relationships such as chain of command, and exhibit characteristics- scalar chain, unity of command, span of control. These relationships may also represent line or staff functions, and may be centralized or decentralized. As the authority relationships are grouped, structural configurations emerge.
Two major structural types are identified: functional and divisional. These two types represent the "root" or generic categores un . In evaluating the research on structural configurations it appears that most of the infructural configurations it appears that most of the in-
ferences drawn using the more complex structural forms have involved pooling the data back into the two broad generic categories in order to relate growth and diversifi-
cation strategy to the structure variable. For this reason, the more generic classifications are adopted for use here. Firms defining their major subunits in terms of the business activities (production and operations, marketing, finance and accounting or stages in the manufacturing process) are functionally structured.
Firms which are split into a number of quasi-autonomous units, each headed by a general manager and supplied with the resources necessary for it to operate as an independent economic entity are divisionally structured. Structures in cluded under this category include product division, geo graphic division, and holding company forms.

## PERFORMANCE

The third area of audit is Performance, items 19-34. Per formance looks at the outputs. A strategic manager must look at the financial numbers in order to understand what is going on in the company. It is critical that the strategist learn to appreciate and "love" the numbers in order to de velop effective strategy.

## 19-34. Performance

Performance on the Company Profile Sheet (items 19 34) involves evaluating select numbers from the income statement, balance sheet, and calculating a few significant ratios. In addition, expenditures on Research and Development, Marketing, and Patents are noted.
A few key questions to consider when evaluating perfor mance

- Identify financial Trends (year 20XXn-1 to 20XXn) from Income \& Balance Sheet Statements; What do they tell you?
- Consider the key ratios (liquidity, leverage, operating, profitability); What do they tell you? (include formulas you used to calculate ratios)
- Strengths/ Weaknesses of financials
- What do the financials NOT tell you?
- What else would you need to know to do a really effective financial due diligence from a strategic perspective? How would your analysis change if you were going to buy the company versus selling the company?
A few tips to interpreting and presenting the financials from a strategic perspective:
- The numbers should presented left-to-right. This is how strategists read.
- Revised versus Unrevised: If there were any major changes to a company (ex. sold a business unit), the numbers need to be revised in order to compare year-to-year performance. If we want to look at the company historically, we would look at the original numbers; if we want to look at the future, we would look at the revised numbers.
- Basic versus Diluted numbers: Use basic if looking historically, use fully diluted if you are considering buying the company or are a very conservative investor.
- The numbers should also be questioned constantly as they can be manipulated to show what we want. For example, the stock price of a company can change daily. To make the stock appear like it is performing better, the value listed could be the high value of the year versus what the stock was trading at today or at the end of the fiscal year. Another issue is that assets are listed as book value versus market value.
- Finally, recognize that different people look at the numbers in different ways. Accountants perceive the numbers one way, finance people another way, and strategists yet another way. Be aware of the dif-ferences- this will affect not only what information you present but how you present it


## Sample Company

TimeWarner ${ }_{\text {Ster }}^{\text {Rate Name }}$


## 



I. StRategy - SEGMENTNFORMATION (Revernec; Operaing Income by Segmen)


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# Middle Grades Student Achievement and Poverty Levels: Implications for Teacher Preparation 

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#### Abstract

This paper provides a history of the standardized testing and accountability movement, the curriculum standards attached to the accountability movement, and the attempted shift to common core. Student poverty and its impact on student achievement the focus of this paper. Recognizing the impact of poverty on student achievement as measured by standardized tests the authors question the explicit practices of teacher preparation programs in preparing teacher candidates to work with students of poverty.


## INTRODUCTION

In a time of increased accountability measures and volatility of educational policy, public and legislative bodies have become increasingly focused on student achievement as reported in statewide standardized test scores. Having all students take the same standardized test is like saying that we have "standardized" children and that we all expect them to learn in the same ways and exhibit this learning in the same way--through these standardized assessments. What these "one-size-fits-all" assessments fail to take into consideration, however, are the varied backgrounds of our students. Many factors play an important part in a student's academic success, like special needs or environmental factors; this study focused on students' socioeconomic status and how this affects student achievement. This paper discusses the implications of this research on current and future teacher preparation programs in higher education at the undergraduate level.

## STANDARDIZED TESTING

Popularity in standardized testing has risen dramatically after the publication of $A$ Nation at Risk: The Imperative for Educational Reform by the Reagan administration in 1983; this report portrayed the American educational system as a failing entity and proposed that its only way to redemption was through stricter accountability measures (i.e., increased standardized testing) ("Is the Use of Standardized Tests Improving Education in America?," n.d.).

The use of standardized testing has become controversial as these tests have become "high-stakes" for students and school faculty and administrators. Why do legislators and the general public care about standardized test scores? Numbers are the easiest data to analyze, and "educational attainment is well recognized as a powerful predictor of experiences in later life," policymakers and the public assume that standardized testing data provide accurate reflections of student achievement (Brooks-Gunn \& Duncan, 1997, p. 61). However, as the push for increased accountability through standardized assessment gained momentum it left many students falling through the cracks; standardized tests do not take the varying experiences of our students into consideration when it comes to test results, and as a result, achievement gaps became the norm for many subgroups but most noticeably for our economically disadvantaged children. Additionally, the recent downturn in our nation's economy has resulted in a greater income gap between our schools' wealthy and disadvantaged children: "...the Great Recession wreaked havoc among working-class families' employment. This has led to greater residential segregation and homogenously poor neighborhoods, leading to a higher concentration of poor students in certain schools" (Neuman, 2013, p. 18). The time frame that our nation experienced the Great Recession coincided with No Child Left Behind's deadline of having all children test as proficient in math and reading (according to standardized tests) by 2014; our nation did not meet this benchmark.

There are perspectives in favor of standardized assessments, in general, standardized tests are inclusive and non-discriminatory because everyone has to take them, regardless of race, gender, or ability. These tests can provide an indication of student's ability on a variety of topics while identifying areas of strengths and weaknesses, and they can also be a useful tool for assessing the schools themselves (Brown \& Hattie, 2012, p. 29Ø). Moreover, advocates of standardized assessments argue that these tests make certain that schools and faculty members are held accountable to taxpayers for their instruction and he Use of Standardized Tests Improving Education in America?, n.d.)
Concerns regarding standardized testing include placing too much emphasis upon scores, student testing anxiety, "teaching to the test," skewed test results, cheating concerns, and socioeconomic and cultural bias (Brown \& Hattie, 2012; Olson, 1999). Part of the concern regarding standardized testing comes from concern that there is too much emphasis placed upon them, leading to concerns about student testing anxiety, "teaching to the test," skewed test results, and possible cheating concerns (Olson, 1999; Brown \& Hattie, 2012, p. 289). Because these tests are considered "high-stakes," poor student performance can lead to negative consequences for students and teachers alike; to protect both the test-takers and test administrators, "....just as students need an environment of psychological safety to make effective use of assessment, so too do eachers and school leaders need protection from negative consequences" (Brown \& Hattie, 2012, p. 289). Some argue that the more important these tests become in terms of being the basis for promoting or retaining students, for funding or closing down schools--the more that anxiety is it ultimately "drives good teachers and principals that it ultimately "drives good teachers and principals out of Because the stakes of these tests are so high, test anxiety Because the stakes of these tests are so high, test anxiety nation; the Stanford-9 standardized exam, for example, even comes with instructions as to what actions the test dministrator must to take if to what vemits on test booklet (Ohanian 20ø2) Stories like this add to the pubic sentiment that these tests are inflicting serious harm to children, both academically and emotionally and these ssessments do not result in improved cognition (Horn, 2øø3; Popham, 2øø1). Furthermore, despite the avalanche f funds allotted to standardized testing there exists a great deal of evidence that standardized tests do not improve student learning or achievement. in fact according NAFP (the National Assessment of Educational Progress), American children are actually performing worse after the implementation of No Child Left Behind ac-
countability measures ("Is the Use of Standardized Tests Improving Education in America?," n.d.).

Perhaps most important is not what is being assessed but rather what is not being assessed, as what we measure is both invalid and misleading because student achieve ment depends on multiple factors that cannot be readily assessed, like ability, behavior, and socioeconomic statu (Brooks-Gunn \& Duncan, 1997; Wiggins, 2ø12). Be cause these examinations are designed to assess what is easily measured, they are inherently incapable of assessing what cannot be measured. These tests cannot ascertain initiative, creativity, imagination, conceptual thinking curiosity, effort, irony, judgment, commitment, nuance, good will, ethical reflection, or a host of other valuable dispositions and attributes" (Kohn, 2øøø, para. 45). This supports one of Albert Einstein's most famous assertions: "Not everything that counts can be counted, and not ev erything that can be counted counts."

## SOCIOECONOMIC STATUS AND STUDENT ACHIEVEMENT

With regards to this study, socioeconomic status is viewed as a lens through which one measures student achieve ment. Correlational studies show a strong relationship between high poverty and poor academic performance (Sirin, 2øø5; White, 1982; White et al., 1993). This cor relation begins at the beginning of a child's academic career, and even before, in some cases. Pawloski stated that poverty is more influential to academic performance than even gestational exposure to cocaine (2014). In every state in the nation the economically disadvantaged subgroup never outperforms other nonlabeled students regardles of the grade level or subject area, supporting that the vari able with the strongest correlation to academic achievement is socioeconomic status; correlations between SES and student achievement frequently range from . 100 to .800 (Tienken, 2010; White, 1982). In a meta-analysis of research regarding economic status and achievement, S increased throughout the levels of schoolin climaing the middle school and plane of at the high school level (2øø5). This is also an imporant for study on student achievement and SES at the middle leved study is crucial "th [cognitive] effects of wealh [are] indirect is crucial as "the [cognitive] effects of wealth [are] indire Accountability measures a decline in achievement gaps between low income and higher income students; No Child Left Behind legislated a goal of 100 percent of students, regardless of identify ing labels, test at proficient levels by 2014 . However, 2008 study forecast "nearly $10 \emptyset \%$ failure" of Californi schools to meet these accountability measures; the study
cited that the reason for this projected failure would be due to the poor results from limited English proficiency students and high poverty students "(Is the Use of Standardized Tests Improving Education in America?," n.d.). Unfortunately, NAEP data also supports this prediction; the National Association for Educational Progress reported in 2005 that nearly $50 \%$ of all immigrant, minority, and high poverty children would not graduate from high and high poverty children would not graduate from high
school and that in the nation's largest cities, more than $30 \%$ of the lowest-income students land in the lowest percentile rankings on standardized assessments in reading and mathematics (Renzulli, 2ø13). Even the founder of the Educational Testing Service, Henry Chauncey, has been quoted as saying "if there is anything in heredity (such as tall parents having tall children), one would expect children of high socioeconomic group parents to have more ability than children of low socioeconomic group parents;" in other words, according to the architect behind a multi-billion dollar standardized testing company, public schools are now a Darwinian model of survival of the fittest--or perhaps the richest ("No Child Left Behind?" n.d.).

## ACADEMIC STANDARDS

After the implementation of No Child Left Behind, state tandards (and standardized assessments aligned to these tandards) became the norm to meet accountability measures of this legislation. However, there was a common argument that states could not compare data to one another because each state's expectations was different from one nother; hence came the impetus for the Common Core standards, which is a national set of standards that are meant to be used as a curricular framework for all states who adopted them ("In the States," 2012). Like standardized testing, there exists a great deal of controversy surrounding the national implementation of these national standards.
In $2 \emptyset 09$ the National Governors Association, the Council of Chief State School Officers, and the organization "Achieve" Sll led Sy theol Officers, and the organization ent Partners" and the head of the College Board Orga ization, David Coleman, wrote these standards. While there were few educators in this group, there were many ting representatives present (Ravitch as cited in Strauss 014) Becsuse the S , schools, it was prohibited from subsidizing the creation of these standards. As a result, the Gates Foundation has funded the cause with nearly $\$ 200$ million to jump start he implementation of these standards. It is important to hote that these standards are considered a starting point and will continue to be revised as new research arises, and
students cannot currently opt out of this curriculum if they live in a state that has adopted the standards ("NC Common Core Explained: Frequently Asked Questions," n.d.)

Wiggins (1991) asserted that a school has standards when it communicates high expectations for all its learners, and many proponents of the Common Core standards ang that this curriculum does just that. Those in favor of this curriculum believe that, if implemented correctly, it move our nation's schools beyond superficial "test preparation curriculum and gives teachers the opportunity for deep, meaningful learning through fewer and more rigorou standards, helping our nation become more globally com petitive (Conley, 2ø11; Wagner, 2013). Furthermore, by sharing a national curriculum, it will eliminate issues of gaps appearing for students if they are moved from a state mid-year ("The Standards," 2ø1Ø). It will also allow for the sharing of ideas and resources on a national level while still allowing for local flexibility and interpretation of the standards (Phillips \& Wong, 2ø1Ø). Several professional education associations also support these new curricula standards, the most noteworthy being the nonprofit orga nization of the Association for Supervision and Curriculum Development (ASCD). This association, founded in 1943, is a membership-based group of educational professionals and experts, and it was one of the final educational organizations to formally endorse the Common Core standards. The ASCD only endorsed these standards after a thorough yearlong review of the standards development and implementation of this curriculum, and it stressed the importance of teacher and administrator input into thes standards, along with continuous professional develop ment, to make these standards a succes.

Perhaps it is because of improper support and lack of appropriate professional development that opposition, both from political and educational realms, is beginning to grow in response to the implementation of Commo Core standards. While a proponent of the common core himself, Conley warned that, if executed poorly, thes standards could result in "accountability on steroids, sti fling meaningful school improvement nationwide" (2011 para. 2). Furthermore, Diane Ravitch, noted educationa historian, expressed that our schools are now comprised of "guinea pigs" trying out a largely untested curriculum (Ravitch, 2013). Ravitch also relayed her fear that issuing national curriculum could lead to a test-based meritocrac by ranking and rating every student, teacher, and schoo in the country (as cited by Strauss, 2014). Moreover, those opposed to the standards argue that there is no need fo a national curriculum as a response to national mobility rates; as of 2011, the inter-state mobility rate is a mer $1.6 \%$ of the total population, and of that population, only $0.3 \%$ of these are school-age children ("Closing the Doo
on Innovation: Why One National Curriculum is Bad for America," 2ø11).

In Tienken's (2011) research on the growing body of evidence supporting the Common Core standards, he discovered a lack of empirical evidence supporting these standards; this assertion was based upon the $2 \emptyset 1 \varnothing$ Benchmarking for Success report, which was also written by the same group that created the standards. Of the 138 refernces used in this report, Tienken asserted that many of them are repetitive sources and that only four could be considered truly empirical studies directly related to national standards and student achievement (2011). The standards themselves are also a source for dispute. Colege professors who have reviewed the standards at length argue that they are oddly worded and leave much open to interpretation, much like this English Language Arts standard: "Analyze different points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) creating such effects as suspense or humor" (Schmoker \& Graff, 2ø11, p. 2). Other issues surrounding the standards themselves vary. Complaints expressed about English Language Arts are that they focus more on metacognition than content, they are too focused on informational texts (at least $5 \varnothing \%$ of texts in grades 6-12 must be informational), and they convey vague expectations and reading lists (Carmichael et al, 2ø1Ø; Luebke, 2013). Frustrations regarding mathematics standards include an avoidance of standard algorithms, fractions, and basic arithmetic skills, vague expectations for when to use a calculator, and the introduction of concepts before they re appropriate (such as introducing the idea of functions in first grade) (Carmichael et al, 2ø1ø)

Inevitably, growing constituencies of opponents are voicing their concerns that a "one-size fits all" curriculum is counterintuitive and counterproductive in a society that values individualization, differentiation, and customization and that it may place too much emphasis on standardized testing while discouraging teacher autonomy (Stancill, 2013; Westervelt, 2014; Tienken \& Zhao, 2010). Furthermore, it ignores various subgroups like learning disabled students as well as disregards parent and teacher nput in educational policy (Westervelt, 2014). Having a ingle set of standards is myopic in that it assumes that all students start and end at the same academic ability while overlooking student diversity (Tienken, 2011). This diversity has historically been viewed as a mark of strength in our educational system, and it is unfortunate that student diversity is now being viewed as negative as our system attempts to fit every student to the same constricted, standardized mold (Luebke, 2013). Opponents of a nationalized, standardized curriculum often draw the comparison of a doctor practicing medicine: would a person want a one-size-fits-all approach to one's medical treatment?

Tienken and Zhao (2ø10) argued: "Why would you al low your child to receive programmed, standardized, one-size-fits-all instruction? We would not allow that for ou children and we do not see any evidence that standardiz ing instruction will improve education for other peoples children" (p. 7-8).
Further undermining confidence in the Common Core movement has been its effect on standardized testing, th related decline in test scores. Ravitch, who has made her self a vocal opponent of Common Core standards, report ed that the dramatic drop in test scores was intentiona through testing design. In every state where these test have been implemented test scores have dropped by ap proximately $30 \%$, which on NAEP assessments has trans lated to less than 4 in 10 students being labeled as profi cient using the new Common Core standards (Gewertz, 2013; Strauss, 2014;). Given that this steep decrease in test scores is across the general population of students, it only follows that these assessments will hurt students with disabilities, economic disadvantages, and limited English proficiency even more (Ravitch, 2ø13). Given the fact that many states are opting out of paper-and-pencil assess ments in favor of online assessments, this leads to tech nology and additional funding concerns by states (Kober \& Rentner, 2012). U.S. Secretary of Education Arne Duncan has been vocal in his rebuttal to concerns over the precipitous decline in test scores, arguing that "white suburban moms" are upset about the new Common Core tests because "their child isn't as brilliant as they thought they were" (as cited in Strauss, 2013, para. 2). As a result
of the tremendous decline in scores and related of the tremendous decline in scores and related concerns as many as 10 states are now delaying implementation of Common Core assessments, and the board of New York teachers recenty unanimously voted to windraw its sup port for the Common Core standa (Bidwll, 201 . Strauss, 2013). Principals who withdrew their support in after testing and others vomited or lost condrol after testing, and others vomited or lost contre of their bowels or bladders. Others simply gave up. One teache reported 'Tis d' 'I
 out his test booklet" (Bidwell, 2014. para. 9).

With a sudden reversal of state support for the Commo Core, the future of the program is uncertain at best. Al though most states that originally adopted the initiative are still implementing the standards and their respectiv assessments, with the opposition growing, the effect of th standards on student learning is still undetermined at this time (Strauss, 2013).
At this point, after several years of research, development and a nearly-nationwide implementation of the Com mon Core standards, abandoning the movement mid
implementation may be disastrous. As the change process dictates, all implementations have an implementation dip where the process becomes more difficult before true, lastng change takes place. Several researchers believe that the Common Core standards implementation should continue through this "dip" but that some changes are necessary to make it succeed. These researchers believe that rather than as a tool for high-stakes testing, it should be used as a "low-stakes" tool to use for curriculum development and professional development. Furthermore, these researchers argue that Common Core standards and assessments should be subjected to field testing and reviions before using these standards for high-stakes assessments (Mathis, $2 \emptyset 10$ ).

## RESEARCH FINDINGS

This nonexperimental quantitative study with secondary ata analysis was designed to determine how socidary nomic status and student achievement on high-stakes as sessments are related. The study was focused on middle grades students in North Carolina public schools during the 2012 and 2013 end-of-grade state assessments. Comparisons were made between the 2012 assessments (preCommon Core implementation) and 2013 assessments post-Common Core implementation).
In this study the level of socioeconomic status of the student, the academic year, and the grade of the student are the independent variables, and the dependent variable is academic achievement as indicated by proficiency levels (percentage of students labeled as proficient) on standardized assessments in the areas of reading and mathematics in the middle grades (grades 6-8). A paired sample $t$ test was performed to compare proficiency averages between the 2012 and 2013 academic year for reading and math, which addressed research questions 1 and 2. A one way nalysis of variance (AN mine if a significan diza 10012 Pris ardized assess research question 3. The Statistical Program for the Social Sciences (SPSS) was used to analyze data, all of which were analyzed at the . 05 level of significance.

## Research Question

Is there a significant difference between 2012 and $2 \emptyset 13$ Is there a significant difference between 2012 and 2013 zed tests for middle grades students?
$\mathrm{HO}_{7}$ There is no significant difference between $2 ø 12$ and 2013 academic achievement scores on the
mathematics standardized tests for middl grades students.

A paired-samples $t$ test was conducted to evaluate whether a significant
difference exists between academic achievement profi ciency scores on mathematics standardized tests for mid dle grades students between 2012 and 2013. Mathematic achievement scores were significantly lower in 2013 than in 2012 . The results indicated that the mean proficiency score $(M=81.54, S D=10.07)$ was significantly highe in 2012 than in $2013(M=34.83, S D=15.74), t(1 \emptyset 88$ $=107.61, p<. \emptyset 01$. Therefore, the null hypothesis was rejected because test scores were significantly higher in 2012 than in 2013. The standardized effect size index, $d$, was 3.26, which is a large effect. The $95 \%$ confidence inter val for the mean difference between the two years' scores was 45.86 to 47.56 . A plot comparing the means of thes scores is shown in Figure 13.

## Research Question 2

Is there a significant difference between 2012 and 2013 academic achievement scores on reading standardized tests for middle grades students?
$\mathrm{HO}_{8}$ : There is no significant difference between 2012 and 2013 academic achievement scores on the reading standardized tests for middle grades students.

## Figure 1 <br> MEANS OF MATHEMATICS SCORES in MIDDLE GRADES STUDENTS COMPARED BY ACADEMIC YEAR



A paired-samples $t$ test was conducted to evaluate whether a significant
difference exists between academic achievement proficieny scores on reading standardized tests for middle grades tudents between 2012 and 2013. Reading achievement cores were significantly lower in 2013 than in 2012. The results indicated that the mean proficiency score ( $M=$ $70.40, S D=12.65$ ) was significantly greater in $2 \emptyset 12$ than in $2013(M=43.06, S D=14.09), t(1088)=76.06, p<$ $.0 \emptyset 1$. Therefore, the null hypothesis was rejected because test scores were significantly higher in 2012 than in $2 \emptyset 13$. The standardized effect size index, $d$, was 2.30 , which is large effect. The $95 \%$ confidence interval for the mean difference between the 2 years' scores was 26.63 to 28.04 . A plot comparing the means of these scores is shown in Figure 14.

## Research Question 3

Is there a significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2012 and 2013 for middle grades students?

HO1a: There is no significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in $2 \emptyset 12$ for middle grades students.
A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed be-

## Figure 2

MEANS OF READING SCORES IN MIDDLE GRADES STUDENTS COMPARED BY ACADEMIC YEAR.

tween students' proficiency levels in reading and math ematics standardized tests when compared by the schools economic levels for middle grades students on the $2 \emptyset 12$ North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, in cluded four levels: $1 \%-4 \emptyset \%$ economically disadvantaged $41 \%-60 \%$ economically disadvantaged, $61 \%-80 \%$ eco nomically disadvantaged, and $81 \%-1 \emptyset \emptyset \%$ economically disadvantaged. The dependent variable was the percent age of economically disadvantaged students passing both the reading and mathematics end of grade test for 2012 in each of these SES levels. The ANOVA was significant $F(3,359)=57.99, p<. \emptyset \emptyset 1$. Therefore, the null hypothesi was rejected. The strength of the relationship between economically disadvantaged proficiency levels and the fou socioeconomic levels as assessed by h2 was medium (.33)
Because the overall $F$ test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of students passing both the reading and math standardized assessments at every socioeconomic level. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch.
Schools with $1 \%-40 \%$ of students receiving free Schools with $1 \%-40 \%$ of students receiving free or reduced cost lunch scored significantly higher than schools with $41 \%-60 \%$ of students receiving free or reduced cost lunch, and the 41\%-60\% socioeconomic bracket scored significantly higher than schools with $61 \%-80 \%$ of the student population receiving free or reduced cost lunch Likewise, schools in he $\%$ scored significanty highe than schools wh 81\% of the student population receiving free or reduced cost lunch. The circles on the box plots denote ouniers that are farther than 15 ind 3 interquartile ranges), and the star on the box plots de not numbers next to the circles and star indicate the case number of the outlier. The $95 \%$ confidence ine for nurber of che differences, he coll he parwise diferes, as wer as the le are reported in Tible 13, da box plompring the in Table 13, and a box plot companing the means betwee the groups is reported in Figure 15

HO1b: There is no significant difference between pro ficiency levels in both reading and mathematics standardized tests when compared by th schools' economic levels in 2013 for midd grades students.

| Table 1 <br> 95\% Confidence Intervals of <br> Pairwise Differences in Mean Proficiency Scores in Reading and Mathematics Standardized Tests of Middle Grades Students Among Different Levels of Socioeconomic Status |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SES Level | N | M | SD | 1\%-40\% ED | 41\%-60\% ED | $61 \%-8 \emptyset \% \mathrm{ED}$ |
| 1\%-40\% ED | 64 | 66.27 | 10.43 |  |  |  |
| 41\%-60\% ED | 121 | 57.97 | 8.06 | [4.36, 12.23]* |  |  |
| 61\%-80\% ED | 133 | 53.47 | 9.32 | [8.77, 16.84] ${ }^{*}$ | [1.66. 7.34]* |  |
| 81\%-10ø\% ED | 45 | 44.00 | 9.43 | [17.18, 27.36]* | [9.76, 18.18]* | [5.16, 13.77]* |

Figure 3
2012 Proficiency levels MIDDLE GRADES STUDENTS ACCORDING TO SOCIOECONOMIC GROUP


A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between students' proficiency levels on reading and mathematics standardized tests when compared by the schools' conomic levels for all middle grades students on the 2013 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, inluded four levels: $1 \%-40 \%$ economically disadvantaged, $41 \%-6 \emptyset \%$ economically disadvantaged, $61 \%-8 \emptyset \%$ ecoomically disadvantaged, and $81 \%-1 \emptyset \emptyset \%$ economically disadvantaged. The dependent variable was the percentge of economically disadvantaged students passing both in each of these SES levels. The ANOVA was significant,
$F(3,359)=50.78, p<. \emptyset \emptyset 1$. Therefore, the null hypothesis was rejected. The strength of the relationship between ec onomically disadvantaged proficiency levels and the fou socioeconomic levels as assessed by h2 was medium (.30)

Because the overall $F$ test was significant, post hoc multi ple comparisons were conducted to evaluate pairwise dif ference among the means of the three groups. A Dunnet C procedure was selected for the multiple comparison because equal variances were not assumed. There wer significant differences between the means of economically disadvantaged students passing both the reading and math standardized assessments at every socioeco nomic level. Schools with more students on free/reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with $1 \%-4 \emptyset \%$ of students receiving free or reduced cost lunch scored significantly higher than schools with $41 \%-60 \%$ of students receiving free or reduced cost lunch, and the $41 \%$ $60 \%$ socioeconomic bracket scored significantly highe than schools with $61 \%-80 \%$ of the student population receiving free or reduced cost lunch. Likewise, schools in the $61 \%-8 \emptyset \%$ socioeconomic bracket scored significantly higher than schools with $81 \%-1 \emptyset \emptyset \%$ of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges), and the stars on the box plots denote outliers that are farther than 3 interquartile ranges. The numbers next to the circles and stars indicate the case number of the outlier. The $95 \%$ confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 14, and a box plot comparing the means between the groups is reported in Figure 16.

| TABLE 2 <br> 95\% Confidence Intervals of Pairwise Differences in Mean Proficiency Scores in Reading and Mathematics Standardized Tests of Middle Grades Students Among Different Levels of Socioeconomic Status |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SES Level | N | M | SD | $1 \%-40 \%$ ED | 41\%-66\% ED | 61\%-8ø\% ED |
| 1\%-40\% ED | 62 | 25.37 | 10.60 |  |  |  |
| 41\%-60\% ED | 121 | 17.83 | 4.98 | [3.79, 11.29]* |  |  |
| 61\%-8ø\% ED | 126 | 15.04 | 6.34 | [6.48, 14.17]* | [ $0.90,4.67{ }^{*}$ |  |
| 81\%-1øø\% ED | 54 | 11.04 | 4.79 | [10.38, 18.29]* | [4.7Ø, 8.88]* | [1.74, 6.28]* |


| FIGURE 4. |
| :---: | :---: | :---: |
| 2013 PROFICIENCY LEVELS OF |
| MIDDLE GRADES STUDENTS ACCORDING TO |
| SOCIOECONOMIC GROUP. |

## DISCUSSION AND IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE

After analyzing these data, it becomes apparent that student socioeconomic status and academic achievement continue to be negatively correlated, supporting earlier research by Sirin (2005) and White (1982); that is, the higher the poverty level within a school, the lower the academic achievement based on standardized test scores. However, the question still remains regarding the relationship between the new Common Core curriculum and standardized test scores. Although test scores with the new curriculum were significantly lower in $2 \emptyset 13$ than in $2 \emptyset 12$, correlation does not equal causation. One cannot prove that the Common Core curriculum caused lower
test scores. Furthermore, it is often anticipated that test scores are lower the year a new curriculum is implemented, so the findings of this research are consistent with this ed, so the findings of this research
expectation. It is this researcher's recommendation that expectation. It is lis study be replicated longitudinally over the course of 5 years (a normal curriculum cycle) to determine whether 5 years (a normas curriculum cycle) to determine whethe standardized test scores continue to be signifen the
with the the previous North Carolina Standard Course of Study the previous North Carolina Standard Course of Study
Five-year trend evidence would provide appropriate evidence for the effects of the Common Core curriculum on high poverty students.
Additionally, those in control of the educational system must not continue to ignore the host of research that warns against using only standardized testing as the only means of measuring the quality and effectiveness of schools and student achievement. Kohn (2øøø) reminded the public that Piaget warned schools not to rely heavily upon standardized test scores and grades, as they do not
serve as predictors for future success in the adult workserve as predictors for future success in the adult workplace. Popham (2øø1) argued that educators must also accept blame for placing too much emphasis on standardized testing because teachers and principals did not take a more aggressive stance against testing when the ac-
countability movement gained momentum. Furthermore, countability movement gained momentum. Furthermore,
Wiggins (2ø12) pointed out that there are always outliWiggins (2012) pointed out that there are always outliers regarding standardized testing trends. There are some
high poverty schools that score much higher than schools high poverty schools that score much higher than schoo of similar demographics, and occasionally, there are low
poverty schools that do not score as well as other wealthy poverty schools that do not score as well as other wealthy
schools. It is crucial that researchers study the high pover schools. It is crucial that researchers study the high poverwith similar demographics in order to determine which measures or programs educational leaders ascribe to th school's academic success.

One such outlier, Grassy Fork School in eastern Tennessee, became acclaimed for its academic turnaround because of its focus on differentiated instruction, differentiated (and quality) professional development, and attitude its school leaders that changed the culture and climate in the school (Thomas, 2øø9) As a result this school went from nearly being taken over by the state department of ducation to an example the rest of high poverty schools education to an example the rest of high poverty schools ing tolerant and accepting of the link socioconomic stang tond student achievement by referring to it as a truth of us and student achievement by referring to it as a truth of our system (Wiggins, 2ø12).
Lastly, but perhaps most importantly, schools cannot effectively improve student academic achievement without dealing with one of the most critical issues in our schools today: student poverty. Just as a doctor cannot treat a patient's symptoms without attacking the infection, teachers cannot improve academic achievement in students without addressing the underlying economic issues that affect the student and family. Schools in high poverty areas already have difficulty in hiring and retaining high quality teachers due to the inherent difficulty in these positions and cycle of low expectations and poor performance (Potter 2ø13). When the deck is already stacked against high poverty schools and students, high quality instruction is paramount.
Some researchers suggest introducing socioeconomic integration by busing, much like what was implemented during the Civil Rights movement, to bring in better teachers and enhance parent engagement. A 2010 meta-analysis suggested that students in socioeconomically integrated schools performed better in mathematics achievement testing than nonintegrated schools (2013). It is important to note that because poverty is an issue that exists outside the control of our schools, "...no policy improves socioeconomic status' directly....good policy is based on an understanding of causal relationships between family background and children outcomes, as well as cost-effectiveness" (Duncan \& Magnuson, 2005, p. 35). However, there are several ways schools can positively impact our high poverty students to address issues that stem from a ow socioeconomic level

- Provide access to high quality, experienced teachers;
- Provide access to school resources (both at school and at home);
- Maintain high expectations and high quality curriculum;
- Provide parent education and assistance from social services;
- Facilitate community services provided to families through the school (i.e., free dental clinics, parent education workshops, food pantry for families, etc.);
- Focus on early education programs (like Pre-Kindergarten/Head Start programs) and interventions for all at-risk students,
- Provide specialized training and high quality professional development for faculty and staff in best practices for high poverty students;
- Focus on the school becoming a community of learners;
- Improve parent involvement;
- Improve relationships between school and community;
- Increase school funding from local, state, and federal agencies;
- Offer summer enrichment and summer school programs; and
- Maintain for small school and class size (BrooksGunn \& Duncan, 1997; Jensen, 2øø9; Muijs, Harris, Chapman, Stoll, \& Russ, 2øø9; Reardon, 2013 Sirin, 2ø05).
While this list is not all-inclusive, it provides a beneficial starting point for schools that have a large population of high poverty students. However, improving academic achievement in the high poverty school is often an uphil battle.
Sadly, the founder of the Educational Testing Service Henry Chauncey, has been quoted as saying "if there is anything in heredity (such as tall parents having tall children), one would expect children of high socioeconomic group parents to have more ability than children of low socioeconomic group parents" ("No Child Left Behind?, n.d.). In other words, according to the architect behind a multi-billion dollar standardized testing company, pub lic schools are now a Darwinian model of survival of the fittest-or perhaps the richest. If this is the mantra behind standardized testing and accountability in our country our schools, and therefore our nation's future, are in dire straits.


## DISCUSSION AND IMPLICATIONS FOR <br> TEACHER PREPARATION PROGRAMS

The Common Core movement, along with what we know as educational researchers about the effects of poverty on student achievement, has a significant impact on how w are preparing our future teachers as undergraduate stu-
dents at the collegiate level. Schools with high levels of poverty score very low on current measures of effectiveess which are primarily based on standardized tests. Reeves (2ØØø) recognized exceptions to this in his study nd $90 \%$ schools; $9 \emptyset \%$ poverty, $90 \%$ eth nd $90 \%$ proficient on state assessments. Jenson (200) from poverty. Jenson used the SHARE acronym:

- Support of the Whole Child
- Hard Data
- Accountability
- Relationship Building
- Enrichment Mindset.

In addition to recommendations from Reeves and Jenson, Marzano (2øø4) discussed closing gaps of children from poverty with specific approaches to teaching. And finally, Payne (1996) offered schema to understand the experiences and thinking of families in generational poverty. Are these resources being used in teacher preparation?
An informal survey of five teacher preparation programs in the Appalachian area revealed no explicit approach to preparing teacher candidates for teaching students of poverty. All five schools rely on the broad diversity statements in each syllabi, field experiences, and the candidate's final portfolio for evidence of the candidate's preparation in his area. We, the authors, make the assertion that this is not enough
We recommend a deep look at course syllabi to identify where approaches to teaching students of poverty can be included. We recommend that teacher preparation programs identify assessment measures for student learning in this area. The academic gap for children of poverty is too obvious for this to be ignored by teacher preparation programs.

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# Foundations for a Team Oriented Curriculum 

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#### Abstract

The business world today values collaboration and team work skills such as those found in the area of project management, business process reengineering, quality circles, etc. In response, the use of group projects permeates many curricula today with varying consequences and levels of success. Technology claims to enhance collaboration in distributed teams but its success has been a challenge for organizations. Our objective, is to demonstrate that the concepts underlying team work can be the pedagogical basis for a bands-on, information systems class to teach the development of systems to support teamwork. In the end, the class exposes students to the underlying assumptions of good group work and provides underlying principles for how best to automate a collaborative environment.


## INTRODUCTION

The case can be made that while individuals are still important, groups are becoming the de-facto unit of work for organizations today. Working cooperatively is becoming a necessity; while working collaboratively is becoming critical to success.

Over the years, the popular press (Information Week, 1999; Business Week, 1999; Computerworld, 1999; USA Today (Kay 2011); CIO Magazine (Schiff, 2013); Forbes (Adams 2014); and Monster.com (Lester, 2016), identified and continue to identify the fact that organizations today emphasize more and more group work and that teamwork skills are more and more important in recruiting. Pundits estimate that managers spend as much as $80 \%$ of their work time in meetings and working with groups (Johansen, 1998). More detailed studies by Robert Johansen (1998) add additional confirming details. Johansen's list of driving forces contributing to the trend toward the increased use of business teams includes; a decreasing number of middle managers, a trend toward contract work, an increasing geographic spread for companies and more team-oriented companies becoming the model.
This last force is further confirmed in Peters and Waterman's book, In Search of Excellence (1982, p.127), where they record that the small group is becoming the main building block in those businesses with a "bias for action." Kilmann (1985 p.43) presents the team in the most positive light when he writes, "Generally, it is the team approach that will provide the most comprehensive source of expertise and information to solve complex problem,
where synergy enables the team to contribute more than the sum of its members." College recruiters and employers explicitly support this notion as they consistently rate teamwork skills and group skills high in their evaluation of future employees. Martz and Landof (2øøø).

## GROUP AND TEAMWORK SKILLS ARE EMPLOYABLE SKILLS

Mattson (2015) proposes 6 key benefits of teamwork in the workplace: Fosters creativity \& Learning; Blends Complementary strengths; Builds trust; Teaches conflict resolution skills; promotes wider sense of ownership; Encourages healthy risk-taking. Teamwork skills are sought after and employable skills. University of Kent (2ø16) surveyed their graduates who worked for employers such as Microsoft, Target Jobs, and the BBC. The survey results list teamwork as the number 2 skill that employers want. In a second broad based survey, National Association of Colleges and Employers (NACE) reports that "[the] ability to work in a team structure" as the number one skill employers seek (Adams, 2Ø14). US News (Holmes, 2ø14) echoes this finding and places collaboration at the top of their list saying, "It is imperative for college-bound students to function efficiently and appropriately in groups, collaborate on projects and accept constructive criticism when working with others." Finally, the job-search site, Monster.com, identifies teamwork as an essential job skill after review hundreds of thousands of job descriptions (Lester, 2016).

The need to incorporate this desire from employers for the major areas of process losses and process gains along employees with well-rounded, broad-based technical kills complemented with soft skills is not new (Bailey nd Mitchell, 2007. Kung et al, 2006. Martz and Cata 2øø8). Barr and Tagg (1995) identified a gap between academia's "espoused theory" and academia's "theory in use." Essentially, when evaluated, the idea of teaching more re-al-world business concepts, the espoused theory, was not being achieved, the theory in use, by business schools.
These newer, additional program requirements center on activities such as teamwork and integrate knowledge across several functional areas (Trauth et al, 1993). In a study similar to Barr and Tagg (1995), Martz and Landof (2Øøø) found that recruiters ranked team skills in the top three "most desirable" skills for graduates. More significantly, the recruiters surveyed placed team skills among the skills needed for career advancement. Trade publications, ComputerWorld (Ouellette, 1998), and academic research (Bailey and Mitchell, 2øø7; Martz and Cata, 2øø8) continuously confirm that these concerns for business school educations linger. The business information systems field is one academic discipline that has attempted to respond by incorporated more emphasis on where this kills are distinctive competencies for career placement and advancement. These areas include project management, requirement definition, quality circles, etc. As these areas are incorporated, more attention must be paid to understanding how groups work.

## HOW GROUPS WORK

The fundamental task for most problem-solving groups is to resolve an issue. These can be either a problem or an opportunity. As the team works toward resolving its as-
signed issue though, characteristics of the group members signed issue though, characteristics of the group members combine with those of the task in what is almost an infinite number of ways. Combinations which move groups toward better decisions are termed process gains. Those, decision are termed process losses. Shaw (1981) identifies

| TABLE 1 <br> GSS Process Gains and Losses |  |
| :---: | :---: |
| Derivative Process Losses | Primary Process Gains |
| - channel conflict <br> - information overload <br> - overhead costs <br> - GSS influence choosing wrong "structure" <br> - stronger identification of non-consensus | - better analytical support <br> - easier multi-phase voting <br> - more reflective <br> - increase in "effective" group size <br> - wider perspective of information domain <br> - removal of time and geographical constraints |

with significant group research in those areas. Process losses are found with traditional groups, so we should openly expect to find new process losses identified with electronic groups. As ongoing iterations of research in this area occur that compare manual to electronic en vironments (Dennis and Kinney, 1998), new environments are created. One such environment is the group support systems environment defined as an "interactive computer-based environment that support[s] concerted and coordinated team effort toward completion of join tasks" (Polya, 1957). Martz (1999) proposed that as GSS are implemented, researched and used, the new environment may create their own set of group process losses. For example, two such losses - information overload, higher levels of non-consensus - have been identified in the research.
Most researchers, practitioners and theorists describe the task of group problem solving as having a divergent phase, called production, and a convergent phase, termed selection (Table 1). Interestingly, these sub-processes so neces sary in problem solving, seem to antagonize each othe
when a group is trying to reach common ground or consensus.
Historically, groups accomplish the divergent proces more easily than the convergent process. Research show that electronic GSSs have been able to outperform traditional methods for producing numbers of comments and numbers of unique comments (Shepherd et al, 1996; Gal lupe et al., 1992; Dennis and Valacich, 1993; Benbasat and Lim, 1993; Valacich et al., 1994). However, along with this increased production comes the associated dys function of groups inefficiently combining and filtering
the large lists of comments, ideas or items. There are so the large lists of comments, ideas or items. There are so
many items that individuals have difficulty assimilating many items that individuals have difficulty assimilating all the information
This clearly presents a dilemma for problem solving groups. Maximizing the divergent process should provide
uncovering of information; 2.) analysis, the decomposing of information into data and perspective; 3.) synthesis, the recombining of data into information; and 4.) choos ing, the act of selecting a solution to the problem.

## AUTOMATING GROUP PROCESSES

With the introduction of electronic based GSSs, these and other techniques have been automated with varying degrees of success. As an example, the Electronic Brainstorming tool from GroupSystems.com (a.k.a. Ventana Corporation) automates and extends the basic premise of the Brainwriting-type techniques (Nunamaker et al 1997). SharePoint is a collaborative work environment of fered by Microsoft.
SharePoint was created as a way to allow collaboration and increase the productivity of business team processes. Being a Microsoft product, allows for close integration with other Office products which is a coordination bonus. SharePoint allows you the ability to manage documents, organize content, share knowledge, provide collaboration environments, and search for people and information. Newer releases of SharePoint have built-in social functionalities. These features, allow organizations to build communities, share ideas and thoughts, and discover knowledge and resources. Below, we have identified five common group oriented activities and mapped Share Point functionality to them

As stated in the introduction, the purpose of this paper is to show how concepts underlying team based problem solving can become the pedagogical foundation for an in formation systems class. The following five examples at tempt to show this approach. We pick five popular activities or methodologies used in groups or teams for project planning and show how to map these to SharePoint with screen shots from prototype SharePoint development for proof of concept.
de Bono's Six Hat Thinking - As discussed, one of most generic ways to facilitate group problem solving is to have group members provide information based on categories This activity can been seen as a combination of the discovery phase and the analysis phase. The categories prowith the category. One popular group technique is de within the category. One popular group technique is Bono's (1985) six hats.
In the technique, de Bono has designed six categories of or perspectives from which to view a problem. Each cat egory's perspective is some up with a focus. For example the red hat thinking focuses on feelings and hunches; the emotional perspective of the problem. One would find a group member talking about how their gut feels about how to solve or react to a problem. Conversely, a blue hat
perspective focuses on the process for taking the next step in a plan to solve the problem. In the end, the group is taken through prompting questions and activities from the six perspectives in order to get a fuller description of the problem.
SharePoint can be useful in facilitating de Bono's six hat thinking (1985). We were able to accomplish this by seting up keywords on a field in a custom list. Once a member enters their unique point of view, a work flow is initiated that searches the record for specific keywords. When those keywords are found, the workflow assigns the appropriate colored hat based on the entry.
Based on our SharePoint work flow, the following colored hats are associated with the adjacent keywords.

| Table 3 <br> de Bono's Thinking Hats |  |  |
| :---: | :---: | :---: |
| $\begin{gathered} \text { Hat } \\ \text { (Area of Concern) } \end{gathered}$ |  | Potential Keywords |
| White |  | Facts; Information; Data; Figures |
| Blue |  | Agenda; Thinking; Planning; Decision; Global; Overview |
| Black |  | Critic; Difficulties; Weaknesses; <br> Dangers; Analyst; Risks |
| Green |  | Creative; Growth; Alternatives; <br> Possibilities; Ideas |
| Red |  | Emotions; Intuitions; Hunches; Feeling; Instincts |
| Yellow |  | Logical; Positive; Benefits |

Random Stimulation - Random stimulation is a brainstorming and creativity technique used to help members of groups develop more ideas. One simple strategy uses a dictionary to develop a set of words. These words should be randomly selected. Now, each word is reviewed and the associations created by your brain should be recorded. These words and associations become the genesis of new ideas and thoughts. Another more structured example is found in Roger von Oech's (1983) creative strategy
detailed in his book "A Whack on the Side of the Head."

Using a deck of 64 cards with different prompting ques tions, the activity works to help jar the thinking that may have been stalled. For example, a group working to solve about possible solutions. One of the whack packs card would be drawn and read out loud to the group - "Think like a kid"-and used to jumpstart addition discussions

SharePoint can provide prompting words or questions to help individuals and groups generate ideas. One way to accomplish this would be to have a team member create an entry based on the problem they're trying to solve. The entry form, displays random cards from the Roger von Oech's Creative Whack Pack. The card is presented in a defined location on the entry form, where additional field are available to enter new ideas or questions generated by the random stimulation. The workflow would keep track of the 64 cards that have been displayed and display a new card each time the button is clicked, until the randomized rotation starts over. SharePoint also allows the ability to track questions and ideas associated with each card, so those thoughts are never disregarded.
The entry form is available to all members of the team and has the ability to be edited at any time. This allows for collaboration, idea sharing, and thought tracking through out the team without the need to be in the same physical location or time zone.
Force Field Analysis - Force Field Analysis is a proces originally designed by the social psychologist Kurt Lewin (1947) in the 1940's. His idea was to identify those item or influences that both support you plan and that wor against your plan. Once identified, the influences wer scored as to their level of impact. The total scores from each perspective would help resolve the issue at hand. Fig ure 1 provides one visual of this thinking
Stakeholder Analysis - Stakeholder Analysis is a very popular component of management; used broadly for strategic decisions and more narrowly for project management. Regardless of its scope, it is designed to solicit and ensure support of key groups of people or organization - stakeholders - for projects. Stakeholder analysis is the technique to identify these stakeholders and solicit their input and opinions concerning the successful completion of the project. The techniques can be deployed at varying levels. (Babou, 2øø8; Savage et al, 1991; Mitroff and Linstrone, 1993).
Generically, the technique starts with brainstorming the list of stakeholders. From there, there exists many deriva tives of the technique, but most look to have the tean members rate the stakeholders on two characteristics; say "power concerning the project" and "interest in the suc cess of the project." The final ratings are them compiled
and displayed in a matrix using the characteristics and the axes. The results have the stakeholders fall into four natural quadrants (Figure 2). Assuming low to high and er to right as increasing values of the ratings, the upper ect. These are the critical stakeholders and concerns that must be addressed closely. Stakeholders in other areas are important and the techniques suggests are handled differmportant and teche quers should be satisfied : lower left nt: upper left stakeholders should be satisfied; lower left ffort; and the lower right should be kept abreast of the project.
SharePoint, can help you through the whole stakeholder analysis. First, we built a SharePoint form that asks the individual or group to identify the stakeholders. We provided a list of people that might be associated with the project, as a way to keep members thinking about all the people that are affected by their work. Next, with a simple rating process, the stakeholders are identified by their power and interest in the project. The form asks questions about each stakeholder to help the group identify and understand their key stakeholders. Finally, the graph is automatically developed and used in the analysis phase.
Stakeholder Assumption Surfacing Technique (SAST) - SAST is a multi-layered business planning process designed and promoted by R.O. Mason and Ian Micess designed (1981) in their book Challenging Strategic Planning Assumptions: Theory, Cases and Techniques. The process is derived from the recommendations of dialectic thinking whereby emotion is removed from a debate and the facts are presented and studied to obtain truth, as Socrates envisioned it. The SAST process includes the concept of a structured debate which operates to present hypotheses, provide supporting or contradicting data as warrants, evaluate such data with group votes and ratings, and reach a logical conclusion around the problem's solution
In a way this technique can be viewed as combination of the Force Field and the Stakeholder Technique combining portions of each. However, Mason and others (Mason, 69; Mason and Linstrone, 1993; Mason and Mitroff, 1981; Churchman, 1981) have developed a more specific technique concentrating on the assumptive actions of the achore (SAST) they cong Assumption Surfacing tecs of certainty (low to high) - How certain are you of this assumption? - And importance (low to high) - how his assumption? - And importance (low to high) - how ct? The resulting matrix produces a set of important asumptions (upper right) that need validation and interest ingly a set of assumption (lower right) that are identified as Important and Uncertain. Mason and others felt these
to be key items for a successful analysis of a policy or plan ning problem.

## DISCUSSION

Automating team processes will require a combination of information systems development knowledge and of the underlying concepts of team work. The incorporation of courses that discuss and understand team work can be found in various areas. The ability to build a simple computer system also resides in various areas. The most likely pedagogical home will be one that recognizes informa tion technology and it interaction with human beings. One finds this combination in the study of informatics in general and more specifically with information systems.
The class envisioned around this area would combine students with soft skill backgrounds and students with ap plication development backgrounds. One could imagine a student previous classes in psychology or small group theory finding a class that automates those theories appealing. A second student looking for a process to automate would also find well defined and documented activities appealing. The class envisioned would work to merge these interests and build students with practical backgrounds in building team oriented problem solving techniques.

## SUMMARY

Employers value teamwork skills. Therefore it seems rea sonable that teamwork skills are a key skill for students to learn and have at their disposal for their careers. Further it would seem that knowing how to help automate and for business school programs. Building on this premise for business school programs. Building on this premise this paper has presented a proof of concept using proto type automations of five basic team oriented tools. Th students who understand the underlying premises of the activities and can encode them in company work flows fo businesses will be greatly sought after.

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SCREEN CAPTURES

## Figure A1

 Debono's Thinking Hats

de Bonos's six Hat Thinking

de Bono's Six Hat Thinking
$\qquad$
$\underset{\substack{\text { Poblem } \\ \text { Poseripion }}}{ }$
Figure A2 Random Stimulation



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# Emotional Responses to Service Learning: An Exploratory Study 

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#### Abstract

This study measured the emotional responses of students to common service learning activities. Two hypotheses focused on (1) expected changes in the mean emotion scores and (2) expected differences in individual responses. Results showed significant increases in Surprise, Anxiety and Distress and individual differences in Contempt, Disgust and Fear. The findings suggest that educational institutions have a responsibility to adequately prepare students for service learning experiences. There is also a need to accommodate the different sensitivities students have when service learning is required.


There is considerable emphasis on service learning in college curricula. The national average participation rate across all types of educational institutions is 34 percent (Campus Compact, 2ø12). Business schools and professional schools report 35 percent and 38 percent respectively of students actively engaged in service learning. Integrating service learning projects into academic coursework holds the promise of transforming students through positive connections, uniting classroom theory with "real world" applications. The opportunity to step into a service learning experience can motivate, inspire, and engage students while exposing them to some of the challenges in society.
Often these engagement activities are presented to students as a component of a class or as a requirement for graduation, more often they are volunteer activities. At select institutions service learning is heavily emphasized. One recent survey reported $93 \%$ of faith-based or minor-ity-serving institutions include service learning in their mission statements or strategic plans. Institutions provide
a wide range of support for these activities. Universities often provide awards and scholarships to students, awards to faculty and, sometimes, require courses dedicated to service learning (Campus Compact, 2012).

Despite all the encouragement for engaging in service learning there remains 65 percent of students who choose to not participate. This relatively high non-participation rate suggests there are specific and likely unrecognized deterrents to initial or repeated participation. Because emotions play a dominant role in decision-making, it is entirely possible that emotions may be influencing students' decisions to participate in these types of emotionally-laden activities. To increase service learning participation, it may be necessary for educational institutions to recognize, understand, and manage the impact that emotions have on those students who engage in service learning activities.

## AFFECT AND SERVICE LEARNING

Kiely (2øø5) offers a Transformational Service Learning Model that provides a framework for research in this field. He proposes five essential steps as shown in Figure 1.
Kiely's (2005) concept of contextual border crossing refers to the individual differences that influence the way students process service learning experiences. These diverse frames of reference are grounded in the unique personal backgrounds of individuals. They result in differing levels of intensity and dissonance when exposed to service earning; some of which are conducive to learning while others are not. Kiely s concept of personalization is of primary incest Anger, Hap. Sades, Fer, And responses of Anger, Happiness, Sadness, Fear, and Anxiety that result from that dissonance. The senvee learning experiences are then processed by reflecting, problemffectively understanding and empathizing "through new frectiverth ulty" (Kiely, 2005, p. 8). ulty" (Kiely, 2øø5, p. 8 )

Kiely's recognition of emotions as essential to the transormation process is important. It suggests that, like other steps in the experience, how one responds emotionally can contribute to or impede the learning experience. He states that "They [students] experience a variety of emotions including shame, guilt, anger, confusion, compassion, denial, and sadness and he provides observations of student experiences to support this (Kiely, 2005, p. 8).

## PROCESSING AFFECT

The emotions and feelings recognized by Kiely have been explored by others who confirm that service learning activities stimulate a wide range of emotional responses in college students. "hese emotional responses vacillate between "satisfying" and "hazardous" (Carson
\& Domangue, 2013; Coles, 1993). They become part \& Domangue, 2013; Coles, 1993). They become pat
of one's "emotional biography" thus establishing an at of one's emotional begraphy attitude is either one of approach or avoidance (Carson \& Domangue, 2010 Coles 1993). The emotional responses arise from three possible sources: 1) prior service ing experiences (emotional biography); 2) service learn ing site expectations or experiences; or 3) a combination of both previous experience and expectations (Carso Domangue, 2ø13; Coles, 1993). According to Coles (1993), the "satisfactions" and "hazards" that result from service experiences are conceptualized as follows. Satisfactions, which provide motivation for future service engagements, include moral purpose, personal affirmation (discovery of one's own personal abilities), stoic affirmation, and a sense of success and advancement. Coles' hazards inhibit service learning and are identified as weariness, cynicism, anger and bitterness toward the problem, despair (deepening sadness toward service recipients), and burnout. Left unprocessed, unpleasant emotional responses drive movement toward disengagement and burnout. With this in mind, attention to service learning emotional responses, as well as awareness of optimal points of intervention, are essential to ensuring the healthy management and processing of students emotional experiences within service learning activities.

## APPRAISAL

Understanding the dynamic, interdependent systems of affect requires attention to the link between appraisa and emotions. The unique way in which an individual processes and appraises an event establishes the emotiona experience (Frijda, 1993). Richard Lazarus continues Fri jdas emphasis on appraisal by describing emotions as ... the product of reason in that they flow from how we ap
praise what is happening in our lives" (Lazarus 1999 . praise what is happening in our lives" (Lazarus, 1999, p

| Transformational Service Learning Model* |
| :---: |
| Contextual <br> Border <br> Crossing |
| Dissonance |

Graphic representation of the Transformational Service Learning Model. Adapted from "A Transformative Learning Model for Service Learning: A Longitudinal Case Study," by R. Kiely, 2øø5, Michigan Journal of Community Service Learning, 12, p. 8.
87). Within his Cognitive-Motivational-Relational The- dressed in the literature" (Langstraat \& Bowdon, 2ø11, p. ory (CMRT), Lazarus defines two types of appraising: 5). primary and secondary

Primary appraisals assess whether or not the target activity is 'relevant to one's values, goal commitments, beliefs about self and the world, and situational intentions" Lazarus, 1999, p. 76). In other words, primary appraisal takes into consideration: 1) whether the target activity is relevant to personal well-being; 2) whether the target activity facilitates or thwarts a personal goal; and 3) the ole of an individual's diverse goals in shaping an emotion. Within this category, unpleasant emotions (Anger, Fear, Anxiety, Shame, Sadness, Contempt, and Disgust) are experienced in response to appraisals of threat, delay, and thwarting or conflict of goals and goal attainment. The pleasant emotion (Happiness) and non-emotions (Surprise and Interest) are experienced in response to goal attainment or potential movement or openness toward it.
Secondary appraisal refers to a cognitive-evaluative process focused on what can be done about a stressful situation, relationship, or activity. Secondary appraising evaluates three basic issues: 1) blame or credit; 2) coping potential; and 3) future expectations (Lazarus, 1999). For example, if self-blame is the emotional appraisal associatShame or inwardly-directed Anger. If, on the other hand, other-blame is the emotional appraisal, the resulting emotion could be Contempt, Disgust, or outwardly-directed Anger. If credit is the emotional appraisal, the resulting emotion would most likely be Happiness experienced as an increased sense of well-being. One's coping potential serves to either diminish or enhance the emotional experience; it also influences the significance of the experience.
Appraisal of prior experiences plays a role in decisionmaking (Morris, Woo, Geason, \& Kim, 2øø2), and participation in service activities depends on an individuals decision to engage in the activity or avoid it altogether. volve activities in emotionally-laden contexts, one would expect the expect the emotional response to homeless shelters battered women shelters, and food lines ikely have significant emotional impact on students. De pite the evidence that affect infuences engagement in service learning little work has been done to characterize he emotional responses involved Hunt contends that "essentially nothing has been published about the cognitive, affective or social processes experienced during service learning" (Hunt $20 \varnothing 7$ p 28ø). According to L ngstrat, "most attention to the emotionality of service-learning pedagogies remains undertheorized or only implicitly ad-

## METHODOLOGY

In an effort to identify the specific emotional responses of individuals to service learning experiences a sampof teen students was drawn from an undergraduate progran at a private catholic university. Permission for the use of human subjects was received from the university's Institutional Review Board (IRB) subsequent to a formal reques by the authors. All authors hold a certificate of comple tion of human subjects training from the NIH Office of Extramural Research
Emogram, an interactive computer program, was used to measure emotional responses to service learning experi ences (Priesmeyer, 2011). The program assesses eleven basic emotions through the presentation of 33 facial photograph depicting low, medium and extreme expression of each emotion. The subject responds by indicating the extent of concurrence with each photograph. The assessment solicits affective responses and has been used as the primary data collection instrument in a variety of doctor al dissertations (Mudge, 2ø03; Capps, 2005; McGinnis, 2008; \& Edralin, 2010). Measures of emotions are computed as the change in response to a stimulus. This is done by first establishing baseline measures for each individual, providing the stimulus (i.e., the recall of a service learning activity), and then measuring the emotions again in a post-test. Emogram reveals the emotional responses that result from exposure to the stimulus.
Table 1 provides a list of the basic emotions measured by Emogram and an interpretation of each one. The inter pretations are not arbitrary; instead they are based on a review of the literature on human emotions (Darwin, 1897 Izard, Ackerman, Schoff, \& Fine, 2øø8; Lowenstein 2øø1; Plutchik, 1994; Shalif, 1991). The meaning of each emo tion in Table 1 is based on an increase in that emotion.
Subjects were qualified by confirming that they had engaged in service learning activities within the past two years. They then cond IRB consent requirements and were admins end ject was asked to recal a pariol har serce la ence. The Emogram post-test was then administered and results were shared with the subject.

Two hypotheses were constructed for each of the eleven emotions. It was anticipated that service learning experi ences would have a significant emotional impact although no attempt was made to specify whether that impac would result in a decrease or increase of each emotion. The first set of hypotheses, therefore, were tests of the means
between the pre-test and post-test emotion scores with the null hypothesis declaring there would be no significant change and the alternate hypotheses defining a significant change in either direction. A two-tailed $t$-test provides the test statistic.

Hal: Service learning experiences have an emotional impact. The mean value of post-test emotion scores will differ significantly from the mean values of the pre-test emotion scores.

It was also suspected that individual subjects would respond differently to service learning activities. Therefore tests were conducted to identify significant changes in the variance between the pre-test and post-test scores for each emotion. Specifically, it was expected that some individuals may have had substantial emotional service learning experiences that would cause them to respond more pro-

| Table 1 <br> Emotional Response Interpretations |  |
| :---: | :---: |
| Emotion | Meaning |
| Happiness | The activity is congruent with personal goals and competency |
| Interest | Subject is open to additional information and engagement with the activity |
| Surprise | The activity presented unanticipated events or circumstances |
| Disgust | The subject seeks to avoid the action or persons, places, or activities associated with the action |
| Contempt | The subject assigns blame to persons, places, or activities associated with the action |
| Anger | The subject seeks to change or eliminate the action or persons, places, or activities associated with the action |
| Fear | The action presents a specific, identifiable threat to the subject |
| Anxiety | The action relates to multiple, nonspecific threats that suggest ominous conditions or events |
| Shame | The subject associates failures or shortcomings to the action and assigns blame to self for perceived failures |
| Distress | The subject associates vulnerability and a need for help with the action |
| Sadness | The subject associates an irretrievable loss and a sense of helplessness with the action |

foundly than others, resulting in an increase in the vari ance of the post-test measures compared to the variance in the pre-test. Thus, the null hypotheses declare no dif ference in the variance between the pre-test and post-tes difference as measured by an F-test on each emotion. The significance level for all of these tests was set at $95 \%$ (p significance
value=. 05 ).

Ha2: Individuals will respond differently to service learning experiences. The variance of post-test emotion scores will be greater than the variance of pre-test emotion scores.

## RESULTS

Figure 2 provides the mean emotional responses for the subjects in the study. The notable increase in Surprise is apparent along with increases in each of the unpleasan emotions of Contempt, Disgust, Shame, Fear, Anger Anxiety, Distress and Sadness. Happiness, the only pleas ant emotion, declined while Interest showed only a minor increase. Taken collectively, this response profile lack anything positive and includes increases in every unpleas ant emotion. While individual student responses differed the profile in Figure 2, which is based on the means of all subjects, suggests considerable dissonance exists. Sub stantial processing of these emotional responses would be necessary to transform these service learning events into positive learning experiences.
Table 2 provides the specific pre-test and post-test mean scores for each emotion along with the test statistics. Sig nificant results are highlighted in bold type. Note that significant differences in the mean scores were found for Surprise ( $p=. \emptyset \emptyset$ ), Anxiety ( $p=.02$ ) and Distress ( $p=.04$ ) A comparison of the pre-test and post-test mean scores shows that there was a significant increase in each of these three emotions. We can, therefore, accept our first alter nate hypothesis and conclude that service learning does have a significant emotional impact. For this sample, that impact consisted of increases in Surprise, Anxiety and Distress. While not significant at the .05 threshold level, Shame and Fear have $p$-values of . 06 and .07 suggesting these two emotions may also be important responses.
The second set of hypotheses addresses the differences in variance between the pre-test and post-test data to test the variance between the pre-test and post-test data to test the service learning experiences. Here three emotions, Con service leanisg and Fear were significant with differences at $p=\emptyset 1$. An examination of the test results reveals that the variances for these three emotions increased. The sec ond alternate hypothesis is therefore accepted providing

evidence that individuals respond differently to service learning experiences. While this result is as anticipated, this may be a particularly important finding because it suggests that service learning experiences relate to individuals in profoundly unique and personal ways. For example, interacting with the homeless or abused would undoubtedly trigger emotional responses in individuals who ave been personally affected by these conditions while other participants may remain largely unaffected.

## DISCUSSION

Using Lazarus' Cognitive-Motivational-Relational Thery (CMRT), emotional changes can first be examined to determine whether the subject is engaged. This reveals whether the student perceives the experience as relevant. If activities are considered relevant, pre-test and post-test mogram assessments would show changes across at least
some of the eleven emotions. In other words, individual respond emotionally to that which is considered relevant meaningful, and/or worthy of attention. Scores for Sur prise, Anxiety and Distress show significant changes thu indicating that the targeted activities are deemed relevant and that engagement exists. The fact that there are also significant inter-individual differences suggests varyin levels of relevance among the individuals ingests vary

The significant emotional responses in this study can b discussed within the CMRT framework. Surprise, a pre emotion, isn't considered positive nor is it considered negative. Surprise does, however, reflect an unprepared openness or vulnerability to a targeted activity. An increase in Surprise indicates that the participants were "caught off guard" or ill-prepared for the targeted activities. Increases in Surprise across participating subjects suggest that bet ter pre- engagement orientations are needed to ensure that students are fully prepared for their service learning expe-
riences. Additionally, more extensive debriefing is apparently needed to help students process the service learning experiences.

Anxiety is an emotional response based on the appraisal of an uncertain, existential threat. Anxiety occurs when an individual appraises a situation as 1) relevant; 2) incongruent or threatening to goal attainment; and 3) there is no obvious person or group to hold accountable or blamed for a wrongdoing. Increases in Anxiety across participating subjects indicate lack of known structure and direction, diminished self-efficacy, disorientation, panic, and a desperate need for outside guidance and support. Within service learning setting, the participant needs to process the free-floating fear in an effort to define the problem and identify coping strategies or possible courses of acion. Left unaddressed, Anxiety escalates and may cause the individual to disengage and withdraw as a means of self-protection and avoidance.
Distress, an uneasiness or discomfort due to perceived inadequacies or imperfections of the self, often coexists inadequacies or imperfections of the self, often coexists from situations or step into the shadows in hopes that others will not see their flaws. Self-perceived inadequacies others will not see their flaws. Self-perceived inadequacies
and flaws must be acknowledged and addressed in order for the individual to move to an improved state of selfworth. Within the service learning setting, Distress is one of the most common and difficult emotional states to address. Wanting to appear competent and gain the respect of others, students are often unwilling to share deficits and perceived inadequacies. Group processing of service experiences must be done in a way that is accepting of mistakes, perceived inadequacies or flaws and supportive and encouraging of the personal and professional growth of participants.
The literature on burnout can provide guidance in this matter. It can help identify optimal points for early intervention with the goal of curbing emotional exhaustion and depersonalization while supporting personal accomplishment and engagement. Burnout is described as consisting of three dimensions: emotional exhaustion, (Maslach \& Jackson, 1986. Maslach \& Schaufeli, 1993). urnout theory likely offers he hepropiate field of inqui Burnout theory likely offers the appropriate field of inquihow to effectively process the emotional responses associhow to effectively process with service learning experiences.

Encouraging service learning, or requiring it, carries with it an ethical obligation to protect those who engage in it. However, it inevitably exposes some individuals to emotionally significant circumstances because much of the activity is outside the control of the educational institution. Unpleasant experiences work against continued engage-
ment. In some cases, a required service learning experience may compound previous emotional and psychologi cal traumatization for a student. Wendler proposes that human subjects research protection tradition $m$ inform the field of service learning about principles fo ethical community engagement" and offers guidelines fo doing so (Wendler, 2012, p. 30).
The significant results identified here suggest that service learning activities may need an enhanced structur modeled after Wendler's human subjects protection prin ciples. Additionally, a lack of infrastructure, inadequate preparation, and incomplete debrief sessions may explain why there is such a low participation rate among colleg students. One should recognize that these results are based on the recall of a service learning experience; one would expect that the experience itself offers a far riche context and stronger emotional reaction. Regardless, the emotional responses shown here reveal the nature of th memories retained by the individuals tested. The following comment from Carnegie Mellon's Eberly Center for Teaching Excellence \& Educational Innovation capture the central issue here.
Service learning is a potentially rich educational experience, but without careful planning, students can wind up learning far less than we hope or internalizing exactly the opposite lessons we intend. ("Service Learning," n.d. para. 2)
These findings have implications for all those who advo cate, require, or manage service learning. Those responsible for university service learning experiences should examine existing programs and ask "What preparation is provided to students for the situations they will likely experience?" What support is available during and a "er these activities and how is that support structured? What attention is given to the individual background and diferences that may cause some students to unde standably avoid certain activities?" Most importantly "How do see leanng expecices connect whe the goals of ( " " given evidence that he quen resporice to given evidece thif and tha future engese those who participate likely dep epends on how service learn ing activities are managed.

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# Community College Student Success in Online Versus Equivalent Face-to-Face Courses 

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#### Abstract

As part of a nationwide effort to increase the postsecondary educational attainment levels of citizens, community colleges have expanded offerings of courses and programs to more effectively meet the needs of students. Online courses offer convenience and flexibility that traditional face-to-face classes do not. These features appeal to students with family and work responsibilities that typically make attending classes on campus difficult. However, many of the students who tend to take courses in this instructional format have characteristics that place them at high-risk for academic failure. Because of the traditional mission of community colleges, they generally serve more students who fit this highrisk profile. Despite the promise and potential of online delivery systems, studies have associated distance education with higher student withdrawal rates. In addition, research has indicated that online students tend to earn lower grades than students in comparable face-to-face classes. The existence of contrasting findings in the literature exposes the need for additional empirical research relative to the overall success of students in online courses, as well as on factors associated with success in distance education. This is especially true for community college students.


#### Abstract

The purpose of this study was to determine if significant differences existed in student success at the community college level in online courses as compared to face-to-face courses. In addition, the researchers investigated the relationship between selected demographic, academic, enrollment, and external environmental factors and student success in online courses. The study involved secondary data analysis of quantitative data relevant to students enrolled in course sections taught by instructors who taught both online and face-to-face sections of the same course within the same semester from fall 2012 through spring 2015. The target population included 4,604 students enrolled at a public 2-year community college located in Tennessee. Results indicated there was a significant difference in success between students taking a course online and students taking a course face-to-face. Also, there was a significant difference in success based on instructional method when the following factors were considered: age group, gender, student academic classification, and Pell Grant eligibility status. There was no significant difference in success based on instructional method when first-generation college student status was considered.


## INTRODUCTION

The convenience and flexibility offered by distance education has made online education attractive to students in rural locations and those with work and family responsibilities that make attending college difficult (Allen \& Seaman, 2ø15; Hachey, Conway, \& Wladis, 2ø13; Radford, 2011; Wojciechowski \& Palmer, 2øø5). Postsecondary student enrollment in online education has increased at a rate far exceeding the overall higher education enrollment (Allen \& Seaman). The NCES's Integrated Postsecondary Education Data System (IPEDS) reported that $70.7 \%$ of
public, degree-granting institutions participate in some level of distance education offerings. NCES data also indicated that distance education participation has been highest at public 2 -year colleges (NCES, 2ø15).
The role of a community college is different from that of 4 -year colleges or universities (American Association of Community Colleges. Most community colleges award associate's degrees, certificates, and credit for courses designed to transfer to a 4 -year postsecondary institution. They provide workforce development and specialized training to assist area employers. In addition, most offer noncredit courses, cultural activities, and enrichment
programs as a service to members of the community. The majority of these institutions have open admissions policies whereby they allow any individual with a high school diploma or General Education Diploma (GED) to enroll as a student and register for classes. Also, the tuition at these colleges is much less than that at a university. All of tive to a wide range of individuals, particularly minority, low-income, nontraditional-aged, and academically underprepared students (AACC, n.d.; Provasnik \& Planty, 2øø8).
As student enrollment increased at many community colleges over the past decade, institutions expanded course offerings to meet the demand for more class sections. Some institutions had outgrown their existing classroom space and had to determine effective ways to manage the problem without new building construction. One of the core missions of community colleges has always been to provide access to education for students with a wide range of needs. The fact that the 2 -year schools have been leaders in distance education participation seems logical, given that the offering of online courses and programs is a relatively inexpensive way to expand access and serve students with diverse needs (Hachey et al., 2ø13).
Additional NCES data showed the majority of students taking distance education courses were 24 -years-old or older, employed full-time, and either married or with dependent children (Radford, 2011). Traditional-aged college students are 18 to 24 -years-old, and nontraditional students, or adult learners, are generally considered those 25 -years-old and older (Compton, Cox, \& Laanan, 2006; Wyatt, 2011). Although they tend to be more serious, focused, and mature than traditional students, adult learners face challenges as they attempt college. Because they have often been out of school awhile, they are often underprepared for collegiate-level work. Also, their personal lives may require so much time and energy that they have insufficient time to attend traditional classes. Consequently, the dropout rate at many community colleges is higher for nontraditional students than for traditional students.
Although the flexibility offered by online classes potenially allows adult learners the chance to pursue an edumation while fulfolining outside commitments, its structure may also be a banricr to student success. The nature of hink critically, take active roles in their learning experences, and be more self-motivated, independent, selfdisciplined and goal-oriented (Kerr, Rynearson, \& Kerr, 20ø6. Wojciechowski \& Palmer 20ø5). Also not only must students learn new content, they must become fa miliar with the technology required to navigate and par-
ticipate in the course. Many students have issues with the technology, time management, and feelings of isolation as a result of not assessing their fit for this course format pri Woiciechowski \& Palmer). Administrators tapra, 2011 wojciechowski \& Palmer). Administrators tend to agre
that institutions have a more difficult time retaining dis that institutions have a more difficult time retaining dis-
tance education students, but they are unsure whether the cause is the nature of the course, the characteristics of the cause in the nate of chen \& Seaman, 2015).

## Statement of the Problem

As the United States strives to increase the educational at tainment levels of its citizens, institutions of higher edu cation are under pressure to increase student access, meet diverse student needs, and ensure student success. Colleg es and universities have increased the number of students they can serve with distance education programs and courses. Although online courses are popular, primarily courses. Although online courses are popular, primarily
because of the convenience and flexibility they offer, the students who tend to enroll in them have characteristics or circumstances that put them at high-risk for academic failure (i.e., dropping classes, failing classes, and/or with drawing from school).
The purpose of this quantitative study was to determine if differences existed in overall student success at the com munity college level in online courses as compared to face-to-face courses taught by the same instructor and across
disciplines. In addition, the researchers investigated the disciplines. In addition, the researchers investigated th relationship between student success and age group, gen-
der, academic classification, financial aid status, and first der, academic classification, financial aid status, and firs generation college student status.

## Significance of the Study

Institutions of higher education are increasing student access by expanding distance education offerings. Thei common goal is increased educational attainment by citi zens, which means completion of a degree or certificate Therefore, colleges and universities must ensure that students are successful in the courses and programs in which they enroll. The NCES (2015) reported that the 2013 national 3 -year graduation rate at community colleges for first-time, full-time freshmen students at community colleges averaged $29 \%$ for students earning an associate's degree or certificate. Information from the Tennessee Higher Education Commission (THEC) indicated that the $2 \varnothing 14$ state 3 -year graduation rate at Tennessee's community colleges for first-time, full-time freshmen students averaged $28.1 \%$ (THEC, 2015). These statistics show there is room for improvement in efforts to have a more educated public. The identification of factors associated
with student success in distance education could help improve online course development, evaluation, instruction, student advisement, and support services.

## REVIEW OF LITERATURE

## Distance Education and Community Colleges

In 2ø14, $97 \%$ of public 2 -year institutions offered distance education courses, a higher percentage than for any other nstitutional category (Allen \& Seaman, 2015). Approximately $30 \%$ of U.S. higher education students are enrolled in at least one online course, and enrollment estimates for 2013 ranged from 5.3 to 7.1 million online students. The majority of these students attend community colleges (Shea \& Bidjerano, 2ø14). The original intent of community colleges was to provide students from diverse backgrounds with a variety of postsecondary education options. As a result of their many roles, these institutions have attempted to effectively serve students with a broad spectrum of needs, knowledge, skills, and life experiences (Johnson \& Berge, 2012). In an effort to meet student demand for convenience and flexible scheduling options and to increase student access, community colleges have been eaders in distance education (Hachey et al., 2013; Parsad Lewis, 2øø8).
A significant number of students who attend community colleges are nontraditional students with work and family responsibilities that make attending traditional classes on campus difficult (Pontes \& Pontes, 2012). Some studies oll in distance the types of students who of the characteristics of students at risk for non-completion (Aragon \& Johnson, 2008; Hachey et al., 2013). On the contrary, other researchers have found that students who take on-
ine courses tend to have a stronger academic preparation than the average community college student (Xu \& Jaggars, 2ø11b).

## Differences between Online Learning and

## Traditional Learning

Online courses are categorized as asynchronous or synchronous, depending on whether or not the instructor and students interact or meet online at the same time. An asynchronous online course is one that is time-independent. The course materials are generally posted onine for students to access at any time. There are typically specific due dates for assignments and exams, but there are no class meeting times. Students are free to complete work at their own convenience, and they submit assignments by designated deadlines. Communication within an asynchronous course is usually by e-mail or posting on
a discussion board A synchronous online course is time dependent. It includes prescheduled class meeting times at which students and the instructor interact by way of two way video conferencing, Internet chat, or some technological means (Allen et al., 2004; Bergfeld, 2014 Bower \& Hardy, 2004). Communication in an online clal interaction and the use of the vocal expressions and cial interaction and the ure ore the pocal expressions and traditional, face-to-face classroom. Those limitations may , face-to-face classroom. Those limitations may cause frustration for some students.

## Organization and Delivery

Almost all online courses are organized and delivered and using course management software (CMS), also called learning management system (LMS) software, that enables students to access course materials, post on discus sion boards, submit assignments, send e-mails, take as sessments, and view grades (Bergfeld, 2014). Two of the most commonly used CMS systems are Blackboard and Desire2Learn. Many researchers concur that student fend to be more successful in distance education if they of technology and are comfortable with it (Dupin-Bryant, 2ø04; Hachey et al., 2013; Harrell \& Bower, 2011; Ker et al., 2øø6).

## Student Success in Distance Education

Many researchers agree that the most successful student in online learning are self-disciplined, self-motivated, goal-oriented, responsible, and organized (Johnson \& Berge, 2012; Kenner \& Weinerman, 2011; Kerr et al., 2006; Kiely, Sandmann, \& Truluck, 2004; Neuhauser 2002; Rovai, 2004; Wojciechowski \& Palmer, 2øø5) These students also possess skills in time management, multitasking, and critical thinking. In addition, they are able to take responsibility for their own learning and work independently. Most of these characteristics align with those of an adult learner, or a nontraditional studen (Wojciechowski \& Palmer). As older students, nontraditional students are usually more mature and have prior knowledge and life experiences they want to relate to their education in some manner (Johnson \& Berge; Ken ner \& Weinerman; Kiely et al.). Adult learners have much to offer as students, but there are potential obstacles to their success in higher education. These include the lack of financial resources, a lack of self-confidence, under-pre paredness for collegiate level coursework, the lack of suf 006, Ke, and a lack of academic focus (Compton et al., 2øØ6; Kenner \& Weinerman; Kiely et al.; Wyatt, 2ø11).

Xu and Jaggars (2011a) analyzed student data over a score, semester format (8-week or 16 -week), and ASSET 5 -year period from institutions of the Washington State Board of Community and Technical Colleges to compare academic outcomes of students enrolled in online courses to those of students in hybrid and face-to-face courses. Students in online courses were more likely to withdraw or fail than those in face-to-face courses. Also, students who took a greater proportion of online courses were less ikely to complete a program of study or transfer to a university (Xu \& Jaggars, 2011a). Similarly, Xu and Jaggars 2011b) examined data over a 4 -year period from the Virginia Community College System (VCCS) to compare of introductory college-level English and mathematics courses. The students who took the courses online were courses. The students who took the courses online were
significantly more likely to withdraw. This was true for both the English and math courses. In addition, the perboth the English and math courses. In addition, the per-
centage of students who made a final grade of a "C" or betcentage of students who made a final grade of a "C or betboth the English and math courses (Xu \& Jaggars, 2ø11b). Shea and Bidjerano (2ø14) analyzed NCES Beginning Postsecondary Student Survey (BPS ø4/ø9) data to compare degree completion rates of community college students enrolled in distance education courses during their first year to those of students enrolled in all face-to-face courses during the first year. They concluded that the students who participated in online education during their first year of college had higher rates of degree attainment than those who did not take online courses during the first year.

## actors Associated with Success in <br> Distance Education

Wojciechowski and Palmer (2øø5) investigated the relationship of various student characteristics to success in an online business course at a community college over a period of 3 years. For purposes of the study success was he class. The same instructor taught ach section of the course and used the same theng in seas the searchers concluded that a significant relationship existed searchers conched for rer from highest to lowest significance) and success in order from highest to lowest significance) and success in all GPA, attendance at an ans ion, number of course withdrawals in the past, ASSET placement test reading score number of online courses in the past, student age and ACT English score. There was o significant relationship between student success in the online business course and these variables: full or parttime status, gender, ACT composite score, ACT reading
writing score (Wojciechowski \& Palmer). Nontraditional students tend to have lower overall completion rates in higher education than traditional-aged students; however, research is contradictory relevant to the relationship between student age and online succes (Compton et al., 2Øø6). The results from several studies indicated that completers tended to be older students a opposed to traditional-aged students (Muse, 2003; Neuhauser, 2øø2). Wojciechowski and Palmer (2øø5) discovered that younger online students did not perform as well as older students. However, other researchers reported that student age had no relationship to online course completion (Aragon \& Johnson, 2øø8; Park \& Choi, 2øø9).
Aragon and Johnson (2øø8) also found that the completion rate was higher for females than for males. However Park and Choi (2øø9) observed no effect on course con pletion based on students' gender.
With regard to student course load, Aragon and John son (2øø8) reported that students who did not complete online courses tended to be enrolled in fewer hours than those who did complete online courses. Conversely, Wojciechowski and Palmer (2005) found that student enrollment status had no statistically significant relationship with online success. Educational level is determined by the number of credit hours a student has completed and refers to the classification of a student as a freshman sophomore, junior, or senior. Dupin-Bryant (2004) ob
served that lower-division online students tend served that lower-division online students tended to be non-completers more often than upper-division students. Muse (2003) found that the more credichours commu nity college students had completed, the more successfu they were in online classes.

The number of online classes students have taken may be an indicator of technological proficiency. Research ers consistently found that students who had previously taken online courses or had relevant computer experience were more successful in distance learning than those who had less online experience (Dupin-Bryant, 2004; Hache et al., 2013; Harrell \& Bower, 2011; Kerr et al., 2øø6).

## METHOD

This study involved secondary data analysis of quantitative data extracted from the student information databas system of the participating institution, a public 2 -yea community college located in Tennessee. The target population included students enrolled in course section taught by instructors who taught both online and face-toface sections of the same course within the same semeste during the following semesters: fall 2012 , spring 2013 , fall $2 \emptyset 13$, spring $2 \emptyset 14$, fall $2 \emptyset 14$, and spring $2 \emptyset 15$. Disciplines
represented included accounting, anthropology, biology, business, chemistry, economics, English, history, information systems, mathematics, political science, psychology, ociology, speech, and theater. The total number of stutest of independence (two-way contingency table analysis) was used to analyze the data relevant to research question The other five research questions were addressed using . Tcriptive analyses. A significance level of 05 was used to determine statistical significance.

## Data Collection

Prior to the study the researchers obtained approval to Prior to the study the researchers obtained approval to
conduct research from the administration at the participating institution to conduct the study and collect existing data from the student information database system for secondary analysis. Data relevant to the research questions were collected on all students enrolled in course sections taught by instructors who taught both online and face-toface sections of the same course within the same semester during the following semesters: fall 2012, spring 2013, fall 2013 , spring 2014 , fall $2 \emptyset 14$, and spring $2 \emptyset 15$. To protect the identities of the students and instructors and to maintain anonymity, unique identifier numbers were used in place of the identification numbers typically used in the institutional database. Members of the administrative computer programming staff at the participating institucomputer programming staff at the participating instituwith data that contained no personally identifying information on participants.

## Data Analysis

For the purposes of this study the researchers considered student success to be demonstrated by the final course letter grades earned in the classes included in the study. Final course grades had six possible levels ("A," "B," "C," "D," "F," or "W") and were assigned to students by the course
instructor based on class performance relative to expected learning outcomes.

This study involved secondary data analysis of quantita tive data extracted from the student information databas system of the participating institution, a public 2 -yea community college located in Tennessee. Discipline represented included accounting, anthropology, biology business, chemistry, economics, English, history, informa tion systems, mathematics, political science, psychology, sociology, speech, and theater. The total number of students involved in the study was 4,604. A chi-square (c2 test of independence (two-way contingency table analysis) was used to analyze the data relevant to Research Question 1. The other five research questions were addressed using descriptive statistics.

## Research Question 1

Is there a significant difference in student success as measured by the proportion of students making a letter grad of "A," "B," "C," "D," " $F$," or "W" on the final course grade between students taking a course online and students tak ing the same course with the same instructor face-to-face A two-way contingency table analysis was conducted to evaluate whether student success, as measured by the proportion of students making each letter grade on the final course grade, varied depending on instructional method The two variables were final course grade and instructional method (online or face-to-face). Student success and instructional method were found to be significantly related Pearson c2 $(5, \mathrm{~N}=4,272)=4.15, \mathrm{p}$. 001 , Cramer's $=.11$. Table 1 indicates the percentage of students earnin each final course letter grade by instructional method.
uate specific differences among proportions of student

| Table 1 <br> Percentage of Students Earning Each Final Course Letter Grade by instructional Method |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Instructional Method | Final Course Grade |  |  |  |  |  | Total |
|  | A | B | C | D | F | w |  |
| Face-to-Face | 38.0 | 25.6 | 16.9 | 6.1 | 10.2 | 3.2 | $1 \emptyset \emptyset . \emptyset$ |
| Online | 42.6 | 24.2 | 11.7 | 4.4 | 11.3 | 5.8 | $1 \emptyset \emptyset . \emptyset$ |

earning each final course letter grade. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the pairwise comparisons onducted. In genera, students taking a class online were than students taking a class face-to-face. Students taking class face-to-face were more likely to make a "B," "C," or "D" than students taking a class online.

## Research Question 2

What is the distribution of grades in online and face-toface courses for traditional-age and nontraditional-age students?
Table 2 displays the percentage of traditional age and nontraditional age students earning each of the letter grades for online and face-to-face courses. Nontraditional age students were more likely than traditional age students to make an " A " in both online and face-to-face courses. Traditional age students taking face-to-face course were least ikely to drop a course. The other three groups displayed similar drop rates. Traditional age students were more ikely than nontraditional age students to make an " F " in both online and face-to-face courses.

## Research Question 3

What is the distribution of grades in online and face-toface courses by gender?
Table 3 displays the percentage of male and female students earning each of the letter grades for online and face-to-face courses. Both males and female online students were significantly more likely to make an "A" than their peers in face-to-face courses. Surprisingly both online groups, males and females, were significantly more likely to withdraw from an online course than in a face-toface course. Both groups were also slightly more likely to make an " F " in online courses. Males had approximately the same chance of making a passing grade ( $\mathrm{A}, \mathrm{B}$, or C ) in online and in face-to-face courses ( $75.0 \%$ and $76.5 \%$
respectively). Females had a significantly better chance of making a passing grade in online classes ( $79.9 \%$ ) than in face-to-face courses (73.3\%).

## Research Question

What is the distribution of grades in online and face-toface courses by academic classification?

Table 4 displays the percentage of freshman and sophomore students earning each of the letter grades for online and face-to-face courses. Sophomores were significantly more likely to make an "A" than freshmen. Freshmen were more likely to make an "F". This was especially true for freshmen taking online courses. Both freshmen and sophomores were twice as likely to drop an online course as they were a face-to-face course.

## Research Question 5

What is the distribution of grades in online and face-to face courses by Pell Grant Eligibility Status?
Table 5 displays the percentage of students by Pell Grant Eligibility earning each of the letter grades for online and face-to-face courses. Students that were not Pell Grant eligible were more likely to make an "A" and to make an "A"
" B ", or " C " than Pell Grant eligible students. Students both groups (Pell grant eligible and not Pell Grant eligible) were more like to withdraw from online courses.
Research Question 6
What is the distribution of grades in online and face-to face courses by first generation college student status?
Table 6 displays the percentage of students by first genera tion college status earning each of the letter grades for on-
line and face-to-face courses. Students that were first genline and face-to-face courses. Students that were first gen eration and those that were not first generation had simila Both groups we in los likely to withdraw fro couses. face courses than from online courses.

| Table 3 <br> Percentage of Students Earning Each Final Course Letter Grade by Delivery Methods and Gender |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Delivery Method | Gender | Final Course Grade |  |  |  |  |  |  |
|  |  | A | B | C | D | F | W |  |
| Online | Male | 38.5 | 25.0 | 11.5 | 4.6 | 13.9 | 6.5 | 100.0\% |
| Face-to-Face | Male | 33.1 | 24.9 | 18.5 | 7.2 | 13.0 | 3.3 | 100.0\% |
| Online | Female | 44.1 | 24.0 | 11.8 | 4.3 | 10.4 | 5.5 | 100.0\% |
| Face-to-Face | Female | 41.5 | 26.1 | 15.7 | 5.3 | 8.2 | 3.2 | 100.0\% |

## TABLE 4

Percentage of Students Earning Each Final Course Letter Grade by
Delivery Methods and Academic Classification

| Delivery <br> Method | Classification | Final Course Grade |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A | B | C | D | F | W |  |
| Online | Freshman | 33.4 | 24.9 | 14.0 | 4.3 | 16.8 | 6.8 | $100.0 \%$ |
| Face-to-Face | Freshman | 29.9 | 24.8 | 19.1 | 8.3 | 14.5 | 3.4 | $100.0 \%$ |
| Online | Sophomore | 41.8 | 25.1 | 11.4 | 5.2 | 10.1 | 6.4 | $100 . \emptyset \%$ |
| Face-to-Face | Sophomore | 41.9 | 28.5 | 16.3 | 3.6 | 5.9 | 3.9 | $100.0 \%$ |

Table 5
Percentage of Students Earning Each Final Course Letter Grade by Delivery Methods and Pell Grant Eligibility Status

| Delivery Method | Pell Grant Eligible | Final Course Grade |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A | B | C | D | F | w |  |
| Online | Yes | 37.5 | 24.9 | 13.4 | 5.1 | 13.1 | 5.9 | 1øø.ø\% |
| Face-to-Face | Yes | 35.4 | 26.2 | 17.7 | 6.0 | 11.1 | 3.6 | 1øø.ø\% |
| Online | No | 50.1 | 23.3 | 9.1 | 3.3 | 8.7 | 5.5 | $1 \emptyset \emptyset . \emptyset \%$ |
| Face-to-Face | No | 41.3 | 24.9 | 15.9 | 6.3 | 9.0 | 2.6 | 1øø.ø\% |

Table 2
Percentage of Students Earning Each final Course Letter Grade by Delivery Methods and Age Group

| Delivery Method | Age Group | Final Course Grade |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A | B | C | D | F | w |  |
| Online | Traditional-age | 35.3 | 24.9 | 12.9 | 5.7 | 14.7 | 6.5 | 100.0\% |
| Face-to-Face | Traditional-age | 33.8 | 25.8 | 18.7 | 7.0 | 11.6 | 3.1 | 10ø.0\% |
| Online | Nontraditional-age | 45.3 | 24.4 | 11.0 | 3.3 | 9.7 | 6.3 | 100.0\% |
| Face-to-Face | Nontraditional-age | 47.2 | 24.8 | 11.9 | 2.6 | 7.9 | 5.6 | 100.0\% |

Table 6
Percentage of Students Earning Each Final Course Letter Grade by
Delivery Methods and Generational Status

| Delivery Method | First <br> Generation | Final Course Grade |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | A | B | C | D | F | W |  |
| Online | Yes | 40.9 | 23.9 | 13.6 | 5.0 | 10.9 | 5.8 | 100.6\% |
| Face-to-Face | Yes | 35.5 | 27.6 | 16.9 | 7.4 | 10.6 | 2.1 | 100.0\% |
| Online | No | 37.6 | 27.1 | 10.2 | 4.8 | 13.6 | 6.6 | 100.0\% |
| Face-to-Face | No | 37.9 | 25.7 | 17.9 | 5.2 | 10.1 | 3.2 | 100.0\% |

## DISCUSSION

From fall 2012 through spring 2ø15, the period from which data were collected, the overall student population averaged: $76 \%$ traditional-aged and $24 \%$ nontraditionalged, $61 \%$ females and $39 \%$ males, $44 \%$ enrolled full-time and $56 \%$ enrolled part-time, and a composite ACT score of 18.9. In addition, $75 \%$ of traditional-aged students were cligible to receive federal Pell grants (TBR, 2ø14; THEC, 2015).

## verail Student Success in

## Online Versus Face-to-Face Courses

The results relevant to Research Question 1 indicated that students in online courses were significantly more ikely to withdraw from a class than students in face-toface courses. This finding was consistent with those of earlier studies (Allen \& Seaman, 2015; Aragon \& Johnson, 2øø8; Hachey et al., 2ø13; Harrell \& Bower, 2011; Wojciechowski \& Palmer, 2øø5; Xu \& Jaggars, 2ø11a, 2011b). Another result from the present study was that students in an online course were significantly more likely to make an " $A$ " or " $F$ " final course grade, whereas those in face-to-face course were more likely to make mid-range grades of a "B," "C," or "D."
Over $21 \%$ of students in online classes made an "A," as compared to $18.8 \%$ of students in face-to-face classes. In face-to-face classes $24.1 \%$ of students made grades in the "B," "C," or "D" range, as opposed to $2 \emptyset .3 \%$ of students in online classes. There was no consensus among previous esearch, but indications were that online students tended to earn lower grades than face-to-face students (Capra, 2011; Helms, 2ø14; Scherrer, 2ø11; Sue, 2ø05; Xu \& Jaggars, 2011b). The results from the present study suggest onsistent with nor contradictory to earlier findings regarding grades based on demographics.

CONCLUSIONS
Results indicated there was a significant difference in student success between students taking a course online and tudents taking the same course with the same instructor face-to-face. Also, there was a significant difference in student success based on instructional method when the following factors were considered: age group, gender, student classification, and Pell Grant eligibility status. There was no significant difference in student success based on instructional method when first-generation college student status was considered.
Students who were nontraditional-aged, sophomores, and non-Pell Grant-eligible tended to have success in online courses at higher rates than other students in this study.

Ironically, these are the student groups who often have personal responsibilities, work obligations, and financial management issues that make attending and completin school a complicated and challenging process (Compton et al., 2øø6; Wyatt, 2ø11)
One factor that must always be considered with respect to the success of students concerns financial aid rules and regulations. Although $58.4 \%$ of students in this study were eligible to receive Pell Grants, many additional students most likely received other types of financial aid (i.e., loans, scholarships). Generally, a student must maintain full-time enrollment status to continue receiving aid. Also, they must maintain a specified minimum GPA which varies from one type of financial aid to another. Sometimes students who are doing poorly in courses will remain in the classes and receive " $F$ " grades, instead of dropping and having their load status change to part time. The effect of the " F " on the GPA may be less damag ing overall in terms of keeping financial aid.
Limitations
Factors not explored in this study may have had an effect on student success. In addition to an analysis of the proportion of students making a letter grade of "A," "B," "C "D," "F," or "W" on final course grades, other options ex ist to define and measure student success. The study was delimited to a specific public community college in Ten nessee. Therefore, the findings may not be generalized to other postsecondary institutions. Also, the study was delimited to course sections taught in both online and face-to-face format by the same instructor within the same semester from fall 2012 through spring 2015. The researchers made the assumption that the course conten and primary requirements were the sar for the line and face-to-face formats of each specific course.

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# ANOVA Analysis of Student Daily Test Scores in Multi-Day Test Periods 

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#### Abstract

Instructors are often concerned when giving multiple-day tests because students taking the test later in the exam period may have an advantage over students taking the test early in the exam period due to information leakage. However, exam scores seemed to decline as students took the same test later in a multi-day exam period (Mouritsen and Davis, 2012). This study reports mean test score analysis of a four-day exam period. Students with higher cumulative GPAs tend to take the exam earlier in the testing period. The majority of students take the exam the last day of the testing period. Test score variance for each test day also increases with each test day. One-way ANOVA analysis finds that mean test scores of students who take the test later in the test period significantly decline. Pairwise comparisons that assume unequal numbers of observations in each group as well as unequal variances of exam scores for each day, show that day 4 mean scores are significantly less than days 1, 2, and 3. The only other pairwise difference is day 1 and day 3. Further, a $4 X 2$ (4 test days by two different professors) ANCOVA analysis is also reported where cumulative GPA and Test \# (4 or more tests each semester) are used as control variables to see if student test scores still decrease for students taking the test later in the testing period. The results show significant decreases in mean test scores as students take the test later in the testing period even when controlling for students' cumulative GPA and Test \# within the semester. An estimated marginal means analysis further shows that the upper bound of day 4 is below the lower bound of days 1, 2, and 3, consistent with pairwise comparisons of test score means. The results suggest that information leakage, if any, is not evident in multi-day test scores. The results suggest that an instructor may bave an opportunity to further belp students taking the exam later in the exam period. Further research on demographics, test preparation, procrastination, self-efficacy, and emotional intelligence of students taking multi-day tests is in order (Hen and Goroshit, 2014).


## INTRODUCTION

Many universities are using testing centers to allow students to take tests when it is more convenient for the student. One of the issues related to testing centers in general, and specifically for tests that can be taken by students over multiple days, is the risk of information leakage to students who take that test later in the test period. However, two studies have found that instead of test scores being higher for students taking the test late in the multi-day testing period, test scores are actually lower for students who take the test later in the multi-day testing period (see

Mouritsen and Davis, 2012, and Reed and Holley 1989). Although, this information does not mean information leakage does not take place, it does suggest that other factors are much more prominent in determining test scores in a multi-day test period than any information leakage that may take place. For example, there are several articles in the education literature that study procrastination in academic settings.

The objective of this research is to discover why average test scores of students who take the test at the end of a multi-day testing period are lower than average scores of students who take the test earlier in the testing period.

This study analyses test scores of students taking exams over multi-day testing periods for introductory financial accounting (Accounting 2010) and introductory managerial accounting (Accounting 2ø2Ø) courses taught by wo dill administered in the teveral semesters. The tests period. Students were allowed to select when to a 4 -day test during the 4 -day testing period. The exams were all multiple choice and no time limit was given. The analyses in this study include test scores from different tests taken during different semesters. Exhibit 1 : shows the Distriduring different semesters. Exhibit 1: shows the Distriduring each of the successive four test days. The data induring each of the successive four test days. The data includes only tests where four test days were used so that the test percentages for each course could be consistent
based on the number of days. Exhibit 1: Distribution of based on the number of days. Exhibit 1: Distribution of
Students Taking Exam Each Day for Both Courses shows Students Taking Exam Each Day for Both Courses shows that more students took the test each successive day of the test period and the total number of tests included in the
study for each course. The total number of tests did instudy for each course. The total number of tests did in-
clude up to four test scores from each individual student for different exams taken during a semester. Exhibit 2: Distribution of Mean Exam Scores by Test Day for Both Courses shows that test percentage scores drop with each Courses shows that test percentage scores drop with each
successive day of the test period. One might expect that better students tend to take the test earlier in the exam period. Exhibit 3: Mean GPA of Students by Test Day for Both Courses shows that, in fact, the average cumulativ GPA of students who take the test earlier is higher than the average GPA of students who take the test later. Thi research is thus aimed at discovering and analyzing what other course and student characteristics might play a rol in students' test taking and scores over a multi-day testing period.
Student characteristics were also paired with the tes scores of each student as well as information about what day the test was taken by each student during a 4 -day testing period. In addition to student test percentage scores the student test percentages were matched with other tes information and student characteristics, including exam number during the semester the course was taken, clas level (freshman, sophomore, etc.), whether the studen was full-time or part-time, and age of student

## RESEARCH DESIGN AND HYPOTHESES

The descriptive statistics support the finding that students' average test scores get worse by day as the multi-da

| Exhibit 1 |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Course | Item | Day 1 | Day 2 | Day 3 | Day 4 | Total |  |
|  | \# of Students | 106 | 147 | 154 | $31 \emptyset$ | 717 |  |
|  | \% of Students | $15 \%$ | $21 \%$ | $21 \%$ | $43 \%$ | $10 \emptyset \%$ |  |
| Accounting 2020 | \# of Students | 68 | 60 | 184 | 428 | 740 |  |
|  | \% of Students | $9 \%$ | $8 \%$ | $25 \%$ | $58 \%$ | $10 \emptyset \%$ |  |


| Exhibit 2 <br> Distribution of Mean Exam Scores by Test Day for Both Courses |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Course | Item | Day 1 | Day 2 | Day 3 | Day 4 | Overall <br> Average |
| Accounting 2010 |  | 88\% | 85\% | 82\% | 72\% | 79\% |
| Accounting 202ø | Mean score by day | 80\% | 76\% | 79\% | 71\% | 74\% |
| Combined |  | 85\% | 82\% | $80 \%$ | 71\% | 77\% |


testing period progresses. With the ultimate objective of the day they took the test and the mean test score for each this research being to discover why average test scores of day. students who take the test at the end of a multi-day testing period are lower than average scores of students who take the test earlier in the testing period, this research takes the following basic approach: First an ANOVA model is used to determine whether there are differences overall in the mean test scores for each of the four days in the testing period. Then, if an overall difference is found, a pairwise test is used to determine which test days exhibit different mean test scores from each of the other test days. Statistical correlations are also run to find relationships between mean student test scores and various course and student characteristics. Using the information from these correations an ANCOVA model is developed to test whether these course and student characteristics are statically significant variables for determining mean test score by test
day. Finally, a marginal means analysis is used to further day. Finally, a marginal means analysis is used to further study the relationship of these student characteristics to

## ANOVA Hypothesis and Test Results

To determine whether the mean test score (test percent age) differs overall for the 4 -day test period an ANOVA model is appropriate. The ANOVA model provides an indication if the mean test scores for the four days are sta tistically different based on days. Formally, the null hy pothesis is as follows:
ANOVA H1(null):
No overall mean test score diffe ences between test days exist.
frinul) is not rejected, then the results of the research end with the finding that, on average, it does not matter which day a student takes the exam in relation to thei mean test score. If the null hypothesis is rejected, then the
results indicate that the mean test scores do differ by day The mean (average) test scores in the descriptive pane of the test period. Based on the descriptive statistics found match the means listed in Exhibit 3. The descriptive panel in Exhibit 3, the expectation is that the null hypothesis also provides the number of students taking the test in will be rejected, in other words, statistical differences exist in mean test scores for students taking the tests over 4 -day test period. One student characteristic that may 4-day test period. One student characteristic that may the test earlier in the test period. Exhibit 3 shows student GPA in relation to mean test score by test day. There may be other explanations for the results as well. Further analysis is in order if statistical differences are found using the ysis is in order if statistical differences are found using the
ANOVA test.

The ANOVA to determine if statistical differences between mean test scores for the 4 -day test period rejects the null hypothesis that there are no differences based on which day the test was taken by students. Exhibit 4 shows the descriptive statistics, the ANOVA and BrownForsythe results the test scores for the 4-day test period. match the means listed in Exhibit 3. The descriptive panel each of the four days, the standard deviation for each of the 4 -days test scores, and the $95 \%$ confidence interval for each of the 4 -days test scores. The main result of the the mean test scores for the four test days (significance of øøø). An important asper test days (significance of .0ص(). An important aspect of the descriptive statistic
reveals that many more students take the exam on the second day than more students take the exam on the second day than on the first day. Day three and four have
more students who take the exam than the previous days as well. Also notice that, with the exception of day three as well. Also notice that, with the exception of day three,
the standard deviation (a measure of variation from the the standard deviation (a measure of variation from the mean test score for the day) increases during the 4 -day test
period. It is not surprising that the standard deviation of period. It is not surprising that the standard deviation of
test scores increases with the number of students taking test scores increases with the number of students taking
the exam on a given day-more students, more variety. This finding suggests that students taking the exam each

## Exhibit 4

## Mean Test Percent Score

anOVA Results and Brown Forsyth for Non-homogeneity of Variance

## Descriptives

| Descriptives |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Day | N | Mean | Std. Deviation | Std. Error |  | 95\% Confidence Interval for Mean |  |  |  |
|  |  |  |  |  |  | Lower Bound |  | Upper Bound |  |
| 1 | 174 | . 851935 | . 1332764 | .01ø1037 |  | . 831993 |  | . 871877 |  |
| 2 | 207 | . 822888 | . 1571310 | .0109214 |  | . 801356 |  | . 844420 |  |
| 3 | 338 | . 799901 | . 1418721 | .0077168 |  | . 784722 |  | . 815080 |  |
| 4 | 738 | . 713808 | . 1708646 | .0062896 |  | . 701460 |  | . 726155 |  |
| Total | 1457 | . 765773 | . 1674227 | .0043862 |  | . 757169 |  | . 774377 |  |
| ANOVA |  |  |  |  |  |  |  |  |  |
|  | Sum of Squares |  | df |  | Mean Square |  | F |  | Sig. |
| Between Groups | 4.354 |  | 3 |  | 1.451 |  | 57.835 |  | .øø |
| Within Groups | 36.459 |  |  |  |  | . 025 |  |  |  |
| Total | 40.812 |  |  |  |  |  |  |  |  |

## Robust Test of Equality of Means

|  | Statistic $^{2}$ | df1 | df2 | Sig. |
| :--- | :---: | :---: | :---: | :---: |
| Brown-Forsythe | 65.282 | 3 | 970.419 | .$\emptyset \emptyset \emptyset$ |

${ }^{-}$The Brown-Forsythe test, which accounts for the lack of variance homogeneity, indicates statistically significant results even with unequal variances and unequal number of test scores in each day.
${ }^{2}$ Asymptotically F distributed
day may have differences that lead to different exam scores for each day. The fact that the number of students taking the exam each day increases by day and that standard deviations for each day test scores also generally increase procedures generally assume homogeneous (similar) vari procedures generally assume homogeneous (similar) varihr) variances, the Brown-Forsyth test was also performed The Brown-Forsyth test results show statistical differthe Brown-Forsyth ences in mean test scores for the multi-day testing period even when accounting for unequal variances and unequal
number of students taking the test each day. With statistinumber of students taking the test each day. With statistical differences in mean test scores for the 4 -day testing pe-
riod confirmed by the ANOVA and Brown-Forsyth tests, riod confirmed by the ANOVA and Brown-Forsyth tests, he next step is to test for pairwise differences of mean test scores for each day.

# Pairwise Hypothesis and Test Results 

In the case of differences, a pairwise comparison can provide information as to any statistical differences between mean test scores for each day in relation to each of the other days. Formally, the null hypothesis states:

## Pairwise H2 (null): No day-to-day pairwise differ ences in mean test scores for each of the four test days exist.

If H 2 (null) is rejected, we will then have information concerning which test days' mean test scores are statisti cally different from each of the other test days' mean tes score

| Exhibit 5 <br> Pairwise Comparisons of Test Days' Mean Exam Scores |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Multiple Comparisons Tamhane's T2 Pairwise Test1 |  |  |  |  |  |  |  |  |
| Exam Day <br> (a) |  | Exam Day <br> (b) |  | Mean Difference (a-b) | Std. Error | Sig. | 95\% Confidence Interval |  |
|  |  | Lower Bound | Upper Bound |  |  |  |
|  | 1 |  |  |  | 2 | . 0290471 | . 0148782 | . 272 | -. 010304 | . 968398 |
|  |  | 3 | . $0520339^{*}$ |  | .0127135 | .øøø | . 018404 | .085664 |
|  |  | 4 | .1381275* |  | .0119014 | .øøø | . 106621 | . 169634 |
|  | 2 |  | 1 | -. 0290471 | . 0148782 | . 272 | -.068398 | .010304 |
|  |  |  | 3 | .0229868 | .0133726 | . 418 | -. 012371 | . 058345 |
|  |  |  | 4 | .1090804* | .0126030 | .øøø | . 075735 | . 142426 |
|  | 3 |  | 1 | -.0520339* | . 0127135 | . $\square \square \square$ | -.085664 | -. 018404 |
|  |  |  | 2 | -.0229868 | .0133726 | . 418 | -. 058345 | . 012371 |
|  |  |  | 4 | . $0860936^{*}$ | .0ø99553 | .øøø | . 059834 | . 112353 |
|  | 4 |  | 1 | -.1381275* | .0119014 | .øø | -. 169634 | -. 106621 |
|  |  |  | 2 | -.1090804* | .0126030 | . $\square ø \square$ | -. 142426 | -. 075735 |
|  |  |  | 3 | -.0860936* | .0099553 | .øøø | -. 112353 | -. 059834 |

The mean difference is significant at the 0.05 level.
The Tamhane's T2 is a pair-wise procedure based on the Student $t$-distribution. Tamhane's is a more conservative post hoc comparison for data with unequal variances and is appropriate when variances are unequal and/or when he sample sizes are different." (source: chapter 11, page 256 of Basic Statistics and Pharmaceutical Statistical Applications By James E. De Muth

The results of the pairwise test comparing the mean test score of each day to each of the other three days is found in Exhibit 5: Pairwise Comparisons of Test Days' Mean Exam Scores.

Pairwise procedures result in mixed results as to whether he null hypothesis of no means test score differences of a particular day in relation to each of the other days is rejected or accepted. The results show that day 1 mean score s not statistically higher than day 2 (272), but it is higher han the mean test scores of day 3 (.øøø) and day 4 (.øøø). The day 2 mean test score is not different than day 1 (.272) or 3 (.418), but it is higher than day 4 (.øøø). Finally, day 3 mean test score is higher than day 4 test score (.øøø). It should be noted that day 4 mean test score is significantly ower than each of the other three days' mean test scores (.øø).

The Tamhane's T2 pairwise procedure was chosen because this particular pairwise test is appropriate when unequal samples sizes exist and when variances (i.e standard deviations) are also unequal. Since pairwise differences between mean test scores for most of the days are found, further analysis is needed to determine why the test scores for different test days tend to get lower as test days progseeks to find answers to the question, "Why are test scores for the last day, day 4 , lower than each of the other three days of the exam period?"

## Correlations of Test Scores with

## Student and Course Characteristic

Since some pairwise differences between each days' mean test scores were found, the next step is to study potential reasons why different days in the testing period yield diferent mean test scores. Statistical correlation procedures are used to find strong or weak relationships between student and course characteristics (i.e. course/prof, test number, student GPA, class level, full/part time) and test cores. Exhibit 6 shows the Correlation results between tudent test scores and student's cumulative GPA, exam day, exam number, class level (freshman, sophomore, etc.), semester, and age of student.
The Pearson correlations were significant for GPA (.437; ØøØ), exam day (-.312; .øøø), and exam number (-.292; $000)$. Exam number refers to the first to last exams in the semester. Tor correlation shows that exam scores tend to makes sense as exams taken later in the semester typicaldeal with more difficult topics or topics that build on y deal with more difficult topics or topics that build on fourse it makes sense that exam day has negative corre course it makes sense

Exhibit 8
Estimated Marginal Means of Exam Score Percentage and Exam Day

| Dependent Variable: Percent of Exam Score |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Exam Day |  | Mean | Std. Error | 95\% Confidence Interval |  |
|  |  | Lower Bound |  | Upper Bound |
|  | 1 |  | .814a | .$\varnothing 1 \varnothing$ | . 794 | . 835 |
|  | 2 | .797a | . 10 | . 777 | . 817 |
|  | 3 | .789a | . 007 | . 775 | . 803 |
|  | 4 | .733a | . 005 | . 723 | . 743 |

. Covariates appearing in the model are evaluated at the following values:
CUM_GPA_UGRAD $=3083.18$, Exam \# $=2.62$.

Estimated Marginal Means of Exam Score Percentage and Exam Day 95\% Confidence Intervals


## LIMITATIONS, SUMMARY

## CONCLUSIONS AND FURTHER STUDY

The breadth of the study is fairly limited since only two different accounting courses and only two different professors are included in the data. Readers should also recognize that, although the variables used as measures of student and course characteristics exhibit correlations or strong relationships between student test scores, cause and effect cannot be concluded. For example, we cannot conclude that a student's GPA causes their test score on any particular exam. However, the relationship between a student's GPA may help an instructor predict who may need more help in learning information to perform well on a test.
The results show significant decreases in mean test scores as students take the test later in the testing period even when controlling for students' cumulative GPA and Test within the semester. An estimated marginal means analthe lower bound of days 1,2 and 3 , consistent with pairwise comparisons of test score means. This results suggest ise conct day test scores. The results clearly show that students tak-號 he exam on days one through three. The results suggest the exam on days one through three. The results suggest help students taking the exam later in the exam period. Further research on demographics test preparation and test taking skills of students taking the exam on day 4 is in order. Perhaps interviews with students can provide a further understanding about student motivation, student test preparation, and student test-taking challenges. Particularly, further research can help instructors learn potential ways to help day four test takers improve their test thential ways to help day four test takers improve their test

Hen and Goroshit (2ø14) provide some direction for future research on how teachers might find ways to help students. They found that procrastination is related to ower levels of self-regulated learning and academic selfefficacy (Bandura, 1977) and associated with higher levels of anxiety, stress, and illness. They also review and discuss emotional intelligence (EI) and how it may influence a student's ability to assess, regulate, and utilize emotions associated with academic self-efficacy and academic performance including student GPA (see also Haycock, et al., 1998; Wolters, 2øø3; Zajacova, et al., 2øø5; Seo, 2øø8; Klassen et al., $2 \emptyset \emptyset 8$; Deniz, et al., 2øø9). Using the data in the current study, the test starting times showed that day 4 students started the exam on average at $2: 51 \mathrm{pm}$ while day one average was $12: 39 \mathrm{pm}$, day 2 average was 1:12 pm , and day 3 average was $1: 24 \mathrm{pm}$. The days of the week showed that most all the tests were taken during week-
days, so weekend test days were not a factor of taking the test later in the day. This data is another indication that procrastination plays a role especially for day 4 test takers. uture research could use standardized tests available measure students for emotional intelligence, self-efficac and motivation, look for direct and indirect relationship to procrastination and academic success. Then instructo might be able to begin to address these related issues to help students be more successful in academic settings.

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# JOINT CONFERENCE <br> May 24-27, 2017 <br> Nashville, TN 

## International Conference on Learning and Administration in Higher Education (ICLAHE.org)

## Academic Business World International Conference (ABWIC.org)


#### Abstract

All too often learning takes a back seat to discipline related research. The International Conference on Learning and Administration in Higher Education seeks to focus exclusively on all aspects of learning and administration in higher education. We wish to bring together, a wide variety of individuals from all countries and all disciplines, for the purpose of exchanging experiences, ideas, and research findings in the processes involved in learning and administration in the academic environment of higher education.


We encourage the submission of manuscripts, presentation outlines, and abstracts in either of the following areas:

## Learning

We encourage the submission of manuscripts pertaining to pedagogical topics. We believe that much of the learning process is not discipline specific and that we can all benefit from looking at research and practices outside our own discipline. The ideal submission would take a general focus on learning rather than a discipline-specific perspective. For example, instead of focusing on "Motivating Students in Group Projects in Marketing Management", you might broaden the perspective to "Motivating Students in Group Projects in Upper Division Courses" or simply "Motivating Students in Group Projects" The objective here is to share your work with the larger audience.

## Academic Administration

We encourage the submission of manuscripts pertaining to the administration of academic units in colleges and universities. We believe that many of the challenges facing academic departments are not discipline specific and that learning how different departments address these challenges will be beneficial. The ideal paper would provide information that many administrators would find useful, regardless of their own disciplines

The aim of Academic Business World is to promote inclusiveness in research by offering a forum for the discussion of research in early stages as well as research that may differ from 'traditional' paradigms. We wish our conferences to have a reputation for providing a peer-reviewed venue that is open to the full range of researchers in business as well as reference disciplines within the social sciences.

## Business Disciplines

We encourage the submission of manuscripts, presentation outlines, and abstracts pertaining to any business or related discipline topic. We believe that all disciplines are interrelated and that looking at our disciplines and how they relate to each other is preferable to focusing only on our individual 'silos of knowledge'. The ideal presentation would cross discipline. borders so as to be more relevant than a topic only of interest to a small subset of a single discipline. Of course, single domain topics are needed as well.

## Conferences

Academic Business World (ABW) sponsors an annual international conference for the exchange of research ideas and practices within the traditional business disciplines. The aim of each Academic Business World conference is to provide a forum for the discussion of research within business and reference disciplines in the social sciences. A secondary but important objective of the conference is to encourage the cross pollination of disciplines by bringing together professors, from multiple countries and disciplines, for social and intellectual interaction.

