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Understanding Business Education: Examining the Effect of the Application of Strategic Learning Among Diverse Business Disciplines

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This research is a product of the Doctor of Business Administration (DBA) program at George Fox University.
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Learning Among Diverse Business Disciplines

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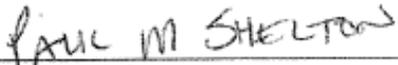
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**Definitions of Terms**

Several terms within this study required operationalization for the purposes of

creating a common vocabulary for clarity and understanding. Many of the terms used in

business and higher education have either ambiguous, generic, or multiple meanings. A

working set of definitions for these various terms was necessary in order to establish a

more precise and intelligent discussion.

Strategic Learning

The concept of *strategic learning* has several definitions in modern business and

education literature. For the purposes of this study, strategic learning assumes a broad

definition which applies to education overall, not just the study of business specifically.

In this regard, strategic learning is described by Weinstein, Palmer, and Acee (2016) as

having three components: skill, will, and self-regulation, each of which contribute to the

focus of the concept overall. As stated by Weinstein et al. (2016), with respect to

strategic learning, "the focus is on covert and overt thoughts, behaviors, attitudes,

motivations and beliefs that relate to successful learning in postsecondary educational

and training settings. Furthermore, these thoughts, behaviors, attitudes, motivations and

beliefs can be altered through educational interventions" (p. 6). The strategic learning

concept as an academic construct was a principal focus of this study, as the purpose of

this dissertation was to determine if the proposed method for delineating business

students by discipline is an appropriate target for the application of this conceptualization

of learning.

Learning Attributes

Within the strategic learning framework, learners exhibit many different attributes when acquiring new knowledge. The characteristics and skills displayed by learners during a learning event are defined as *learning attributes* by Weinstein, Palmer, and Schulte (1987). They developed a list of ten learning attributes that comprise an overall model for evaluating how individuals learn best in the current third edition of their Learning and Study Strategies Inventory (LASSI) model (Weinstein, et al., 2016). The LASSI model and the attributes it measures were used extensively throughout this study. For reference, the ten LASSI attributes are listed as follows: anxiety, attitude, concentration, information processing, selecting main ideas, self-testing motivation, test strategies, time management, and the use of academic resources (Weinstein, et al., 2016). The LASSI attributes are described in detail in Appendix A of this paper.

Interventions and Outcomes

Within the strategic learning construct, an *intervention* is a procedure or process that can create a change in student thoughts, attitudes, or behaviors to positively affect learning (Weinstein, et al., 2016). Interventions, for the purposes of this study, were considered as either learning strategies employed by educators or self-regulated study approaches employed by students that in some way influence the manner in which learning occurs. Interventions lead to learning and achievement *outcomes*, which, within this study, were defined as the results of a learning intervention. Outcomes can be educator-led learning strategy changes, student-based self-regulated study approaches, or general improvement overall student achievement and success.

Learning Style

Loo (2002a), defines *learning style* as, "the consistent way in which a learner responds to or interacts with stimuli in the learning context. As such, learning styles are intimately related to learners' personality, temperament, and motivations" (p. 349). Learning style is a method for describing a learner's preferences for interacting with the characteristics of the environment, and is related to the learner's personal partialities for acquiring new knowledge. The important distinction between this term and learning attributes is that style is based on individual learner preference and agreeability ("how the learner likes to learn"), while attributes are descriptive of learner ability, motivation, and achievement ("how, and how well, the learner learns"). This was a critical differentiation in this study. While learning style has importance in the context of understanding higher education, and was explored briefly in Chapter 2 of this dissertation for this reason, the focus of this research was on the importance of learning attributes as components of the strategic learning concept.

Business Discipline

For the purposes of this study, *business discipline* is defined as an area of specific academic specialization within business higher education (i.e.: management, marketing, accounting, finance, and so on). Business discipline was determined by the primary declared major of the subjects under examination within their respective business higher education programs. As this study was concerned with better understanding the learning attributes of students within specific business concentrations, the declaration of a primary business major was sufficient for categorizing subjects into these different disciplines of business education. Therefore, with this study, academic major and business discipline

were understood as analogous terms. (Note: additionally, the terms *business*

specialization and *business concentration* were, at times, used interchangeably with the

term *business discipline* within this study, and should be considered equitable

terminology).

Abstract

Strategic learning is an educational construct that evaluates the skill, will, and self-regulation of students across ten learning attributes to determine interventions that can improve overall academic achievement. If precisely implemented to a targeted grouping of students, these interventions can be generalized to achieve broader successful results in learning. Determining these groupings, therefore, is a necessary first step in applying this construct. Business discipline was identified as a possible method of categorizing business students in higher education for the purposes of more precisely applying the strategic learning construct. The purpose of this dissertation was to determine if the delineation of undergraduate business students based upon their selected business discipline is an appropriate target for the precise application of strategic learning. Through the use of the Learning and Study Strategies Inventory (LASSI), a research sample from a U.S. university was surveyed to determine both the subjects' business disciplines and their learning attributes with regard to the strategic learning construct. An analysis of variance (ANOVA) of the resultant data indicated if this method of delineation was suitable for categorizing business students with respect to the application of the strategic learning concept. The findings of this analysis indicated that no statistically significant differences among the discipline groupings were determined with respect to the any of the scales assessed by the LASSI, demonstrating that business discipline is likely not a worthwhile method for delineating business students with respect to their learning attributes.

Keywords: strategic learning, learning attributes, business discipline

Chapter 1: Introduction

The efforts of all organizations, regardless of their industry, must fundamentally balance two simultaneously conflicting requirements: the need to differentiate and the need to integrate (Lawrence & Lorsch, 1970). Differentiation is utilized to meet the diverse needs of varied and complex stakeholders, while integration is essential to maintaining unity of effort in most endeavors. Business schools within higher education face this differentiation-integration challenge in the context of managing student learning. Educators and administrators must diversify the manner in which they pursue student engagement and improved outcomes, while at the same time integrate with the whole of higher education to ensure adherence to educational best-practices and standards.

Differentiation, therefore, is a mechanism which business educators within the higher education environment can and often do use to vary their approaches to improving learning for business school students. Utilizing different approaches to business learning based upon factors such as role specialization, population characteristics, unique aspects of the regional job market, and the features of the local economy (McKenna & Yeider, 1991) all provide for the differentiation required to address the varied needs of a diverse generation of business students. Differentiation should be considered a foundational element of any approach to improving teaching and learning in business higher education.

Statement of the Research Problem

There are many tools at the disposal of business educators, many of which are conceptually based upon some unique aspect or aspects of improving learning for the student. However, differentiating approaches to student learning based upon the aforementioned criteria can potentially present a situation which may mitigate the effectiveness of the use of such tools; this is to say, not every tool will work best in every situation with every distinct group of students. In order to properly employ any learning device, approach, or construct, an understanding of how it will be most effectively utilized must be considered. In order for a learning implement to be put to effective use, the target for the use of that implement must be understood.

Strategic learning is an example of one such construct that can be used to affect outcomes for higher education students. As described in the definitions section of this dissertation, strategic learning, as developed by Weinstein, et al. (2016), focuses on the thoughts, behaviors, and attitudes associated with effective learning in higher education and the interventions which can be utilized to correct ineffective learner characteristics. The difficulty with the strategic learning construct, as with any learning tool, is understanding the best, most effective way to employ it to achieve the highest level of success. Any indication as to whether the intended employment of the concept on a population of students will be successful is therefore desirable. A determination of appropriate targets for the use of the strategic learning concept is needed. This need is the fundamental problem this study aims to solve.

Within business education, one potential target for the employment of the strategic learning concept is the categorization and grouping of students based upon their

distinct business disciplines. Business discipline is an area of differentiation which focuses on the specific academic majors or specializations of the student population, and presents a method through which students may be able to be delineated based upon their thoughts and behaviors as described in the strategic learning construct. Through a study of this particular method of differentiation, an appropriate target for strategic learning as an educational tool may be revealed.

Purpose and Significance of Study

The purpose of this dissertation was to determine if the delineation of undergraduate business students based upon their selected business discipline was an appropriate target for the precise application of strategic learning. Strategic learning as an educational construct is employed in the most effective manner if the specific target for the application of the construct can be validated. The goal of this study was to discover if utilizing business discipline as a method for segregating business higher education students provides a statistically significant means to define groupings for which the application of strategic learning concepts will have similar, generalizable impacts.

Strategic learning is defined by Weinstein, et al. (2016) as having three distinct aspects related to skill, will, and self-regulation. Ten learning attributes are aligned to these three components, each of which can be measured within an individual learner through the use of an instrument known as the Learning and Studies Strategies Inventory (LASSI) (Weinstein, et al., 1987). The LASSI has both diagnostic and prescriptive characteristics as a research instrument, in that it both collects data related to strengths

and weakness as they apply to the ten learning attributes, and also provides feedback that can lead to recommendations on how to adjust learning techniques through what are known as learning interventions. The 60 questions which comprise the LASSI can be examined in Appendix B of this dissertation.

The diagnostic aspect of the LASSI instrument was the primary focus of this study. The aim of this research was to determine the appropriateness of categorizing students based upon business discipline as a target for strategic learning; this was principally done through an examination of the data collected via the diagnostic feature of the LASSI. The prescriptive aspect of the instrument could invariably be used to prescribe interventions based upon this diagnostic data, which could thereby lead to improved learning outcomes for students. Interventions within the strategic learning construct, such as educator-enacted learning strategies and student self-regulated study (Weinstein, et al., 2016), can lead to outcomes which affect the approaches used by educators to affect learning, enable better self-directed learning in students, and improve overall achievement and success in the educational process as a whole.

Intervention possibilities demonstrate the powerful effect that the application of strategic learning may have on the learning process for business student in higher education. Through differentiating the application of strategic learning based upon the selected business disciplines of students with business education programs, significant understanding of the impacts that disciplinary choice might have on interventions and subsequent learning outcomes might be achieved. In order for these differences to have any significance to business higher education, it must first be determined if these differences actually exist. The fundamental purpose of this study is to *diagnostically* test

business discipline as a delineator for differentiating business school students in order to

determine if *prescriptively* applying strategic learning interventions based upon this

categorization is a worthwhile pursuit. Figure 1 below graphically illustrates the process

through which strategic learning can be applied to business education from a disciplinary

perspective, and outlines how this study aligned to the proposed research question that

was the focus of this dissertation.
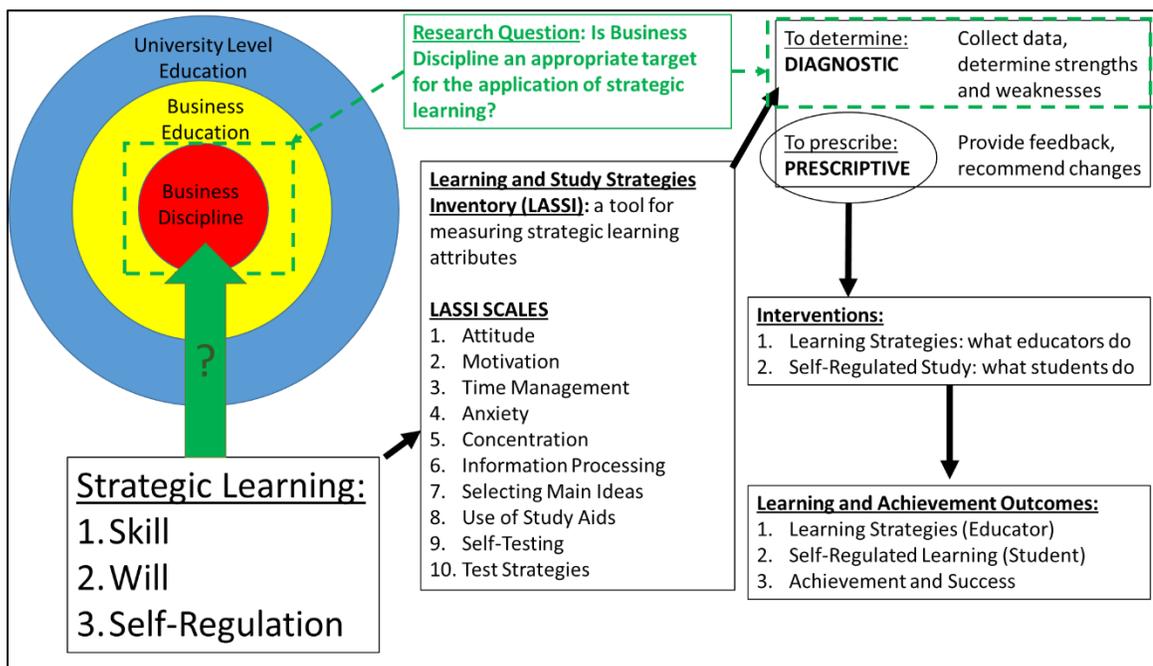
Figure 1: Strategic Learning Process Graphic

Research Hypotheses

The purpose of this dissertation was to determine if the delineation of

undergraduate business students based upon their selected business discipline is an

appropriate target for the precise application of strategic learning. More specifically, this

study determined if statistically significant differences existed among business students

of differing specializations with respect to the ten learning attributes associated with the

strategic learning concept. This finding could establish a student's selected business

discipline as an indicator of the successful and effective application of strategic learning

processes and its associated interventions. This study had the primary goal of first

determining if such differences exist with respect to these ten student learning attributes,

and, if so, to what extent they were significant across the various disciplines of business

education.

Fundamentally, the question being posed by this dissertation was expressed as ten

separate research hypotheses, which aligned to each of the ten learning attributes within

the strategic learning construct. Each hypothesis postulated that a statistically significant

difference existed among students of different business disciplines with respect to a

particular attribute, and also corresponded to a null hypothesis which indicated that no

such significant difference existed. The set of ten hypotheses tested within this study

were expressed as follows:

H-1:
- H-1: There is a statistically significant difference among students of different business disciplines with respect to the **anxiety** learning attribute
- H-1$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **anxiety** learning attribute

H-2:
- H-2: There is a statistically significant difference among students of different business disciplines with respect to the **attitude** learning attribute
- H-2$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **attitude** learning attribute

H-3:
- H-3: There is a statistically significant difference among students of different business disciplines with respect to the **concentration** learning attribute
- H-3$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **concentration** learning attribute

H-4:
- H-4: There is a statistically significant difference among students of different business disciplines with respect to the **information processing** learning attribute

- H-4_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **information processing** learning attribute

H-5:
- H-5: There is a statistically significant difference among students of different business disciplines with respect to the **motivation** learning attribute
- H-5_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **motivation** learning attribute

H-6:
- H-6: There is a statistically significant difference among students of different business disciplines with respect to the **selecting main ideas** learning attribute
- H-6_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **selecting main ideas** learning attribute

H-7:
- H-7: There is a statistically significant difference among students of different business disciplines with respect to the **self -testing** learning attribute
- H-7_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **self -testing** learning attribute

H-8:
- H-8: There is a statistically significant difference among students of different business disciplines with respect to the **test strategies** learning attribute
- H-8_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **test strategies** learning attribute

H-9:
- H-9: There is a statistically significant difference among students of different business disciplines with respect to the **time management** learning attribute
- H-9_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **time management** learning attribute

H-10:
- H-10: There is a statistically significant difference among students of different business disciplines with respect to the **using academic resources** learning attribute
- H-10_0: There **no** a statistically significant difference among students of different business disciplines with respect to the **using academic resources** learning attribute

The null of each hypothesis stated that, upon grouping students with respect to their

business disciplines, no grouping will have any discernable differences than can be

statistically verified as significant with respect to the learning attribute in question for

that hypothesis. The null hypothesis for any particular learning attribute would therefore

be rejected if statistically significant differences among these groupings were determined

for that attribute. In such a case, the hypothesis corresponding to that attribute was said to

be supported by the data collected within this dissertation effort.

Assumptions, Limitations, and Delimitations

As with any academic study, this dissertation contained several assumptions,

limitations, and delimitations which could negatively affect the integrity of the research.

Though important to understand and acknowledge, the impact of these aspects of this

study to the overall findings was relatively low, provided that certain mitigation strategies

were implemented to reduce their influence. The following discussion details these

issues and their corresponding mitigation efforts in greater detail.

Assumptions. The most basic assumption within this study was the notion that

all other factors outside of the student's selected business discipline are relatively similar

throughout the selected sample. Clearly there are many factors which have an impact on

students' learning attributes, and these are influenced by many variables beyond those

under examination in this study. The potentially confounding variables, such as student

age, gender, cultural and ethnic background, language preference, and so on, are all

characteristics of the student which invariably contribute to their learning attributes.

While examining only one variable, business discipline, only provided one vector of

inquiry, it also provided a narrow scope through which this particular means of differentiation could be controlled and thereby more scientifically examined. The assumption, therefore, regarding this condition of the research, is that all of the factors outside of the student's preference in business discipline were relatively homogenous throughout the research sample.

Perhaps the most important assumption made throughout this study was that the categorization of students based upon business discipline leads to a foundation for similar replicative studies which will produce findings that hold across populations in terms of interventions and subsequent learning outcomes. The logical assumption in this regard, provided the aforementioned assumption regarding factors other than business discipline holds, was that similar interventions applied to groupings of students in the same business discipline will yield similar results in subsequent studies. Assuming the other factors contributing to learning attributes are either sufficiently homogenous or otherwise not significant influencers, it was also assumed that any intervention which could potentially be applied to an individual learner within a business discipline grouping to improve learning outcomes will likewise provide the same benefit to all students within that grouping across potential research populations. The effectiveness of learning interventions on outcomes within a grouping are thereby assumed to be influenced solely by the student's discipline, and interventions were therefore assumed to hold across the discipline to yield positive results for any student falling within that disciplinary categorization in future studies. The assumption followed in a somewhat logical fashion, but was very necessary to reinforce the importance and significance of the findings this study produced.

Limitations. The principal limitation which bounded the scope of this study was inherent in the purpose and overall goal of this dissertation, in that this research only sought to determine *if* statistically significant differences exists with respect to the learning attributes of business school students of diverse disciplines. What these differences were, and, subsequently, how they applied to the strategic learning concept was important to justify the purpose of this study, but was beyond the scope of what was to be examined within it. The variables being tested and the information these tests produced only demonstrated if differences among discipline groups are present. What these differences meant, and how they affected students within the strategic learning construct is a clear area of potential future research, but was not explored in this dissertation.

Additionally, limitations existed with respect to data collection within this study. As with any research, the quality of the responses supplied by the research sample had the potential to be flawed due to a variety of factors. Failure to adhere to the directions set by the researcher, implicit bias of the participants, difficultly with the questions and size of the research instrument, and general computational errors on the part of the subjects were all possible, and mostly beyond the control of the researcher. The limitations were mitigated primarily through developing clear guidance for participants and maintaining vigilance regarding the integrity of the data being collected throughout the data collection process. There was no reason to anticipate or expect that these factors would be any more or less of an influence on this study than they would on any other research effort utilizing similar parameters.

Delimitations. In parallel to the first assumption of this study, the main delimiter of this dissertation was that student selected business discipline was the only independent variable tested. Other previously mentioned factors may influence learning attributes, but these factors were not examined within this study. As the purpose of this study was to determine the influence of business discipline on the application of strategic learning, only this variable was tested within the conditions of this effort.

This study also attempted to delimit its sampling by selecting student subjects from a population of only one business school. This was done in order to prevent the introduction of more confounding variables that may have influenced the purity of the study's results, such as regional differences, course and curriculum variations, and so on. Focus on the specific independent variable of business discipline within this study was essential to empirically justifying its influence as an indicator of potential strategic learning application. These delimitations were critical to ensuring the fewest confounding variables possible were introduced into this research.

Overview of Methodology, Findings and Research Implications

A research population of 64 higher education students across four business disciplines (accounting, finance, management, and marketing) was surveyed utilizing the LASSI to attain a 61-subject sample and corresponding data set suitable for statistical analysis. Using single factor, one-way analysis of variance (ANOVA), the data set was used to test the ten research hypotheses of this study and determine if any statistically significant variances existed among the mean percentile scores of the business discipline groups for each learning attribute assessed by the LASSI. The results of this analysis

indicated a failure to reject the null hypothesis for each of the ten learning attribute

categories. The conclusion of this research was that business discipline is likely not a

worthwhile method of delineating students with respect to the application of the strategic

learning concept. This finding represented a position contrary to the current literature on

the subject of differentiation and integration of business discipline. It instead supported a

position that, regarding strategic learning, integration, as opposed to differentiation,

among business disciplines may be the best approach to positively affecting educational

outcomes.

Introduction Chapter Conclusion

The preceding chapter outlined the basic academic purpose, goal, and hypotheses

of this dissertation. The purpose and the specific rationale for why this study has

advanced the academic understanding of business education is discussed in the literature

review which follows in Chapter 2 of this proposal. Following this, the procedure for

testing the hypotheses stated in this introduction is proposed within the research

methodology found in Chapter 3. Collectively, these chapters demonstrate the legitimacy

of this study's purpose and importance, as well as the suitability of the research method

that was employed in its execution.

Chapter 2: Literature Review

Business education at the university level is under consistent pressure "to continually improve student learning and demonstrate, by irrefutable evidence, the quality of their learning outcomes" (Weldy & Turnipseed, 2010, p. 271). The call for improvement and continual renewal is persistent throughout the history of business education. Seminal authors such as Pierson (1959) and Gordon and Howell (1959) supported a conceptualization of business education beyond what was previously regarded as a predominantly qualitative and descriptive field of study, and advocated curriculum based on more scientific and data-driven methodologies. The authors' assertions led to a paradigm shift within business education, and dictated that more quantitative, observable, and recordable methods be utilized to provide curriculum based on hypothesis, observation, and explanation (Mulligan, 1987). The decades-long change in attitude regarding business education persists to the present day, as business education researchers continue to cite a "need for more research on techniques for improving learning and on the development of tools for assessing direct learning" (Weldy & Turnipseed, 2010, p. 272).

This dissertation was sharply focused on exploring the effect of disciplinary specialization on the application of strategic learning as a very specific aspect of business education. Considering this narrow emphasis, the literature review which follows

maintained a purposeful and deliberate concentration on the more current academic

works that had direct influence on this study, as opposed to delving into a broader, more

overarching examination of business education as a whole. The purpose of this

dissertation effort was to bring the discussion regarding business specialization and

strategic learning forward in terms of currency and academic attention. The more

concentrated scope of the review which follows was both intentional and by design to

reinforce this specific purpose.

The following literature review will explore two distinct aspects of business

education, subsequently verifying both the appropriateness and overall need for the

research study. First, the review will examine the concept of business education from a

disciplinary perspective by presenting studies that have explored business education from

both a non-specialized and specialized approach. While the disciplinary viewpoint is

discussed in current literature from several academic outlooks, a fundamental gap in

research does exist specifically with respect to the addressable need for further

understanding the distinctions of *strategic learning*, as defined by Weinstein et al. (2016),

among specific business disciplines. Second, the review will provide insights regarding

the applicability of a disciplinary approach to business education and support its

conceptualization as a matter of practice in the modern business environment, as

observed by Arbaugh et al. (2009). Together, these examinations reinforce the current

state of the academic understanding of the effect of business disciplinary specialization

and its application of strategic learning, as well as demonstrate that which still requires

further exploration.

Business Education from a Disciplinary Perspective

Business instruction is a critical component of university-level learning in the U.S. higher education system. Colby, Ehrlich, Sullivan, and Dolle (2011) assert that business as a profession has never had greater importance in society, and further state that, "Business is also more important than ever in American higher education" (p. 1). This statement is indicative of a common theme in current literature regarding the significance of business education to both its academic and its practical applications in the contemporary environment. Just as successful business operations have prominence in modern society, the characteristics of the methods by which society educates its business practitioners possess equal importance.

Non-Disciplinary Delineation of Business Education. The characteristics of the methods by and through which business practitioners learn in a higher education environment are heavily researched; however, there is substantial variation with respect to how these features are evaluated and subsequently considered by educators as significant with respect to imparting and communicating business knowledge. In an attempt to narrow this level of variation, many researchers apply more direct research focus to specific issues that address only a particular variable aspect of business education, such as student age and gender (Sizoo, Malhotra, & Bearson, 2003), student engagement (Zepke & Leach, 2010), and basic student competency (Jackson & Chapman, 2011). In doing so, more credible information regarding how these characteristics of business education affect end-state learning can be attained.

Disciplinary Delineation of Business Education. Student proclivity to a particular business discipline is another example of an area of specific variation that can

affect business education, and is a topic that has unique implications to this research

study. Several studies in current literature explore these differences among business

specialization to varying degrees. Burke, James, and Ahmadi (2009) conducted a study

on the application of technology in the modern business classroom and examined the

effectiveness of its use with respect to different business specializations. Through the use

of a technology effectiveness survey and a statistical analysis of the results, their analysis

indicated that students perceive technology, specifically, Microsoft PowerPoint

presentations, to be a less effective tool in quantitative courses, such as finance (p value

0.261), as opposed to more qualitative disciplines, such as marketing or management (p

value less than 0.000). In addition, Nicholson and DeMoss (2009) presented a study in

which they discover varying perceptions of deficiency exists with respect to ethics and

social responsibility education across business disciplines. The authors conducted an

analysis (paired t test) of the differences between the perceived and actual amounts of

both ethics and social responsibility integration present in the curriculum of each of four

business disciplines (accounting, finance, marketing, and management). Their results

indicated statistically significant findings, with p values of less than 0.001 for each test

among all four disciplines with respect to perceptions in social responsibility, and three of

four (excluding accounting, which had a p vale under 0.01) with respect to perceptions in

ethics. These studies serve as fundamental evidence that differences in learning

strategies and interventions do exist among specializations within business education, at

least with respect to specific instructional applications such as technology in the

classroom and ethics and social responsibility integration. These studies indicate that

exploring these differences is useful in refining methods, such as those shaped by interventions, to achieve more precise and successful learning outcomes.

Several studies in current academic literature address the disciplinary differences within business education, but through an examination of the variances regarding learning styles among diverse specializations as opposed to the impact of strategic learning. According to Loo (2002a), "Learning style refers to the consistent way in which a learner responds to or interacts with stimuli in the learning context. As such, learning styles are intimately related to learners' personality, temperament, and motivations" (p. 349). While this statement indicates that learning styles can vary significantly among undergraduate students based on a variety of factors, exactly how this variation is defined and what it means to the learning process is still unclear.

Shoemaker and Kelly (2015) conducted a study in which they found different business majors have varying proclivities toward specific learning styles or mixes of styles, be they auditory, visual, or kinesthetic approaches; their survey indicated that finance (66.7%), marketing (60.7%), and general business (61.1%) students prefer visual approaches, while management students (48.7%) prefer kinesthetic methods. Loo (2002b) also obtained similar findings regarding differences among the business disciplines when Kolb's learning styles were applied. Kolb defined four specific learning styles in his model: accommodators (learning through hands-on experience), divergers (learning through concrete situations), assimilators (learning through the logical formation of information), and convergers (learning through discovering practical use) (Loo, 2002b). Loo's findings indicated that these styles were not evenly distributed among the disciplines examined: all disciplines (accounting: 38.5%, finance: 48.1%,

general management: 36.8%, and management: 41.4%) tended toward a majority of

students preferring the assimilator style, with the exception of marketing (35.1%), which

supported the converger learning style (Loo, 2002b). The study further reinforces the

notion that differences among business disciplines do exist, but it is focused specifically

on learning styles, not the attributes that lead to interventions in the strategic learning

construct. Strategic learning in a business disciplinary context as a discrete aspect of the

literature is still an area in need of further examination.

In a more curriculum-focused examination, Islam and Islam (2013) conducted a

study in which they empirically tested the relationship between extra-normal, or

unexplained by normal competence, student ability in economics and student

performance in various discipline-specific courses, namely finance, marketing,

management, and accounting. Their findings indicated that performance in certain

disciplines, such as finance, are related to all aspects of economic study, while others

relate only to micro- or macroeconomics, and still others indicate no relation whatsoever.

The authors concluded that curriculum design changes with respect to economics could

be considered for disciplines in which the relationship between extra-normal ability and

performance was indicated, in order to leverage students' economics capability to more

positively affect their performance.

Moreover, Islam and Islam (2013), when addressing the requirement for

economics education among business students in their conclusion, state the following:

The issue becomes more complicated when we incorporate the potential for

differing requirements pertaining to the various business specializations. These

are essentially uncharted areas. Needless to say, further research is required for a

thorough understanding of these important issues. We believe that research on a

large scale covering institutions where a much wider array of business courses are

offered would be especially helpful. (p. 27)

The statement serves as validation of the supposition that the effect of disciplinary

specialization relative to business education is still an area in need of further research

with respect to how these specializations differ. This dissertation effort attempted to fill a

portion of this research gap through developing an understanding of the applicability of

strategic learning among business students within diverse business disciplines, such as

those under examination in this study.

Application of the Disciplinary Business Educational Approach to Practice

In a literature review on the subject of online and blended learning within the

different business disciplines, Arbaugh et al. (2009) provided a comprehensive

examination of how these areas are currently being approached with respect to the

various specializations in the business field of study. The review indicated that some

disciplines within business education, such as management, have greater levels of

research activity, while others, such as finance and economics, were less well-represented

in the current body of knowledge. Regarding this disciplinary variance in research

volume, the authors stated that this uneven approach stems from the real-world

differences of these specializations with respect to their reliance on research to succeed in

normal operations. More specifically, the transferability of research methods used in

disciplines such as management and marketing make them more suitable for academic

research than subjects such as finance (Arbaugh et al., 2009). In short, the real-world

differences with respect to the needs and priorities of the discipline in its practice drive

the discipline's research applications from the academic to the practical. This

differentiation is vital in understanding how the research and academic study of the

various business disciplines informs and influences their practice, and likewise how the

demands of practitioners drive the call for academic research with a specific

specialization.

Attaining this understanding of the priorities of the various business disciplines

can, and therefore should, be a driver in business education research. More specifically,

the goal of discipline-based research in business education should be to build upon the

needs and priorities of the discipline in practice to produce mutual benefits for

practitioners and researchers alike. This academic construct for business education can

be defined as discipline-based education research (DBER), a term developed in a

research project compiled by the National Research Council (NRC) (2012) at the request

of the National Science Foundation (NSF) regarding the use of this paradigm in science

education. According to this project, DBER "investigates learning techniques using a

range of methods with deep grounding in the discipline's priorities, worldview,

knowledge, and practices" (National Research Council [NRC], 2012, p. 9).

Though the project detailed by the NRC (2012) is focused on the disciplinary

aspects of the study of science and engineering, the concepts espoused within it have

applicability to specialization differences within business education. Science and

business are clearly different subject areas, but the long-term goals of the DBER

construct can be applied to business disciplines to address the issues noted by Arbaugh et

al. (2009) regarding the need to consider business education within disciplines based

upon the priorities of the different fields in practice. These goals, if adequately reflected

in a business educational environment, could provide key insights that would serve to fill

this gap in understanding regarding how the different business disciplines approach the

application of their practice to educational issues.

As defined by the National Research Council (2012), the longer-term goals of

DBER in science and engineering are to:

- understand how people learn the concepts, practices, and ways of thinking of science and engineering;

- understand the nature and development of expertise in a discipline;

- help identify and measure appropriate learning objectives and instructional approaches that advance students toward those objectives;

- contribute to the knowledge base in a way that can guide the translation of DBER findings to classroom practice; and

- identify approaches to make science and engineering education broad and inclusive. (p. 2)

The goals, though specific to DBER in the study of science and engineering, could be

readily utilized in the application of DBER to business education. Forging an

understanding of how expertise is developed within a distinct discipline and guiding

knowledge creation from the practical to the academic are central themes within these

goals, and both have equal applicability to science and business education.

Literature Review Chapter Conclusion

The mutual demand for research between academia and business practice is a catalyst for research requirements within specialization areas. The question remains, however, if business education with respect to its various disciplines is structured and implemented optimally to reflect the specialization differences in business practice. Real-world differences regarding the needs and outcomes required by the business disciplines in practice drive academic research in the manner noted by Arbaugh et al. (2009). However, as indicated by Islam and Islam (2013), within higher education overall, the differences between disciplines still require greater research, and their potential for driving change and thereby affecting outcomes in strategic learning is largely unknown. By developing a better academic understanding of these differences, a congruent understanding of how these differences affect the priorities of business practice might also be discovered. This exemplifies why this research study has both academic and practical importance to the field of business education.

Chapter 3: Methodology

There is a continued need to refine and improve student learning in higher education (Weldy & Turnipseed, 2010). The stated purpose of this dissertation effort was to examine and better understand the effect of disciplinary specialization on the application of strategic learning in the business education environment. More specifically, this study aimed to determine if the delineation of business school students according to their selected discipline is an appropriate method for separating students in order to more optimally apply strategic learning concepts and interventions, such as learning strategies and self-regulated study (Weinstein et al., 2016).

Current academic literature on this topic, however, indicates that developing an understanding of the differences among students of varying business specializations is a still an area in need of further research (Islam & Islam, 2013). Subsequently, understanding how these differences affect the application of strategic learning is likewise relatively unknown. The following chapter outlines the methodology for conducting a quantitative research study that provided insight into how students of different business specializations may exhibit differing learning attributes, which could potentially indicate more effective methods to apply strategic learning in business higher education.

Purpose of the Proposed Research Methodology

Loo (2002a) states that learning styles refer to student interactions with learning context, and that these interactions can be based on numerous factors. What these factors are and the degree to which they are important is the unexplored area of this variation that requires further investigation. Examination of the learning attributes of undergraduate students can be utilized as a powerful method to better understand this variation, and simultaneously propose possible corrective actions to improve potential learning outcomes. The two principles of learning attribute examination, understanding and corrective action, can be defined as the diagnostic and prescriptive aspects of the study of strategic learning. When exploring student learning attributes for the purposes of improving learning outcomes, the goal is to both diagnose student strengths and weaknesses and also provide prescriptive feedback regarding areas for student improvement (Weinstein, et al., 2016).

This dissertation effort was primarily concerned with the application of the diagnostic aspect of strategic learning. The goal of this study was to determine if statistically significant differences existed in the variation of learning attributes among students of different business disciplines. This study's findings indicated if the use of students' selected business discipline as a delineator was an appropriate diagnostic method for generalizing the strengths and weaknesses of particular business student discipline groups. If significant differences were found among discipline groups, it may have indicated that business specialization is an appropriate target for the generalized application of strategic learning in a prescriptive fashion. If, however, no such differences were discovered, it may have suggested that business students' learning

attributes were relatively uniform regardless of their selected discipline. Either outcome would provide an important insight into the further understanding of the influence of business specialization on strategic learning outcomes for higher education students.

Greater fidelity in understanding the effective application of strategic learning on business students with respect to specialization has significant implications in terms of its applied value to higher education stakeholders. Students and faculty, as well as administrators, university executives, and learning support staff members, could potentially all benefit from better understanding if a selected business discipline is an indicator of student proclivity for particular learning attribute associations and subsequent effective learning interventions through the strategic learning concept. By applying the findings of this study, it may be possible to form common associations between certain business disciplines and the specific learning attributes which the study's findings indicate are prevalent within that discipline. The development of such associations could thereby lead to a logical generalization of the types of learning interventions that would be most effective for a particular business discipline's students. With this information, educators in business higher education could better institute interventions, such as developing learning strategies or recommending self-regulated study approaches that align to the learning attributes of the students within a particular discipline as a part of the strategic learning construct.

Prior to the development of these associations and any subsequent influence they might have on strategic learning, it had to first be determined if differences did, in fact, exist among different business specializations with respect to the learning attributes of the students within them. The question of whether or not business specialization is an

appropriate indicator of differing learning attributes among business students had to be

answered empirically. This dissertation effort aimed to do just that, and quantitatively

test a group of business undergraduate students to determine if their selected

specialization was a statistically significant indicator of their learning attributes.

Understanding and ultimately learning the answer to this fundamental question was the

first step in utilizing this information to provide real strategic learning value to business

education stakeholders.

Research Design and Strategy

This dissertation effort was intended to determine if the differentiation of the

different business disciplines create an appropriate target for the application of strategic

learning. In order to accomplish this objective, this study followed the pattern of a

similar work completed by Sizoo, Malhotra, and Bearson (2003) that served as the

fundamental structure basis for this proposed research effort. In their study, Sizoo et al.

utilized the Learning Attributes and Study Strategies Inventory (LASSI) as an instrument

to determine the learning attribute differences among first-year business school students

of different gender and age groupings: specifically, male versus female and traditional

(under 25 years of age) versus non-traditional (age 25 and over) categories. The LASSI is

an instrument developed by Weinstein, Palmer, and Schulte (1987) that collects and

analyzes data regarding student's specific learning attributes, assigning each a percentile

score on one of ten scales. The results for each subject were averaged by age and gender

grouping and the means analyzed through an Analysis of Variance (ANOVA) approach

to determine if certain scales among the groups were statistically different from the

others. Thus, Sizoo et al. were able to effectively test the statistical significance of any differences regarding the various learning attribute scales of the LASSI among their predefined groupings.

While the results of the original Sizoo et al. (2003) study indicated few to no discernable differences between the subjects' attributes with respect to age and gender, the plan for this dissertation effort was to redirect the LASSI instrument to determine if differences regarding these learning attributes exists among students of various business disciplines. The goal of this effort was to recreate the Sizoo et al. study by applying similar data collection and analysis methods, but utilizing preferred or established business discipline as a different criterion for dividing the sample of subjects. In doing so, the question of whether or not these criteria for delineation presents sufficient differentiation to be an indicator of the effective application of strategic learning concepts could be answered.

Research instrument. The LASSI, as defined within its user's manual by Weinstein et. al., "is a 10-scale, 60-item assessment of students' awareness about and use of learning and study strategies related to skill, will and self-regulation components of strategic learning" (2016, p. 6). The instrument requires subjects to provide responses on a five-point Likert scale for 60 inventory items related to test-taking and study strategies, and returns standardized percentile scores across ten scales which correspond to ten specific learning attributes aligning to the aforementioned components of strategic learning, as described in Table 1. Further definitions of each scale of the LASSI can be found in Appendix A of this dissertation; the 60 questions which comprise the LASSI can be examined in Appendix B.

Table 1

Scales of the Learning Attributes and Study Strategies Inventory (LASSI)

Component of Strategic Learning	Learning attribute / LASSI Scale	Abbreviation
Skill Component	Information Processing	INP
	Selecting Main Ideas	SMI
	Test Strategies	TST
Will Component	Anxiety	ANX
	Attitude	ATT
	Motivation	MOT
Self-Regulation	Concentration	CON
	Self Testing	SFT
	Time Management	TMT
	Using Academic Resources	UAR

The LASSI is a well-established and reliable research instrument used by both students and educators for a variety of purposes, including academic baselining, identification of needed educational interventions, and evaluation and advisement of student progression in a course or program (Weinstein et al., 2016). The LASSI is currently in its third edition of development, having been updated as needed to maintain a high standard of quality as a psychometric tool. Cronbach's alpha is a widely-accepted reliability measure of the internal consistency of a testing instrument such as the LASSI; according to Zaiontz (2017), Cronbach's alpha generally ranges between a maximum of one and a minimum of zero (though negative values are possible), with an alpha of 0.6-0.7 indicating acceptable reliability and an alpha greater than 0.8 indicating good reliability. The LASSI manual indicates that the lowest Cronbach's alpha coefficient in the third edition of the instrument is 0.76, with six of ten scales at 0.8 or above

(Weinstein, et al., 2016); these coefficients indicate that the instrument is a reliable psychometric tool for measuring learning attribute data.

Several recent research efforts have utilized the LASSI in order to determine differences in learning attributes, which further reinforce the instrument's suitability as a tool to test a sample population for learning attribute variation and, subsequently, appropriateness for strategic learning application. One such example is that of the study conducted by Dill et al. (2014). In this study, participants took the LASSI to predict student performance in a learning assistance program, utilizing the inventory as a pre/post-test instrument to demonstrate the differences between how students enter and leave the training program to determine the program's effectiveness across the ten LASSI scales. The study was conducted with a sample size of n=118, and the results of this analysis provided a cross-validation of 85.6% functional accuracy for the sample (Dill et al., 2014). The study underscores the credibility of the LASSI as a valid research instrument, and demonstrated how versatile the tool is as a broad measure of learning attributes.

Olaussen and Braten (1998) conducted a study in which a cross-cultural analysis of the LASSI model was examined for consistency among students from different nations. Though somewhat dated, the study examined how Norwegian college students' results from that nation's version of the instrument fit the measurement models suggested by the American developers of the LASSI subscales. Reliability tests from their analyses showed a Cronbach's alpha internal consistency measure that ranged between 0.57 and 0.85 among the ten LASSI scales, indicating desirable reliability, though not to the same standard as denoted in the third edition of the American version of the instrument for

every scale. Additionally, through several iterations of modifications to their

mathematical fit modeling, their results demonstrated a goodness of fit index (GFI) of

0.93 and an adjusted GFI (AGFI) of 0.87 among first-year college students, and a GFI of

0.94 and an AGFI of 0.88 for second-year students. As these scores typically range

between zero and one, the researchers' results indicate that the LASSI produces results

that maintain a statistical fit which is generalizable across the cultures under examination,

with some specific constructs being evident as cross-cultural between American and

Norwegian students.

Despite its age and extensive use, these studies verify that the LASSI is a time-

tested, cross-cultural tool for measure learning attributes. The provided evidence

supports the concept that the LASSI is an effective instrument for determining

differentiation among a sample of subjects for the purposes of verifying differences in

learning attributes. It can be used as a mechanism to indicate if such differentiation exists

in order to create an opportune target for the application of strategic learning.

Discriminator question. The LASSI instrument was utilized to collect

information regarding subjects' learning attributes within this study, which provided the

basis for the dependent variable data required in the subsequent analysis. It was also

necessary to ask respondents a discriminator question which served to divide the sample

into categorical groupings based upon their selected business discipline. Business

discipline information defined the independent variables for this study, and segregated

the subjects into four distinct discipline categories: accounting, finance, management, and

marketing. As such, the following question was also asked of each respondent prior to

completing the LASSI survey:

"Choose one of the following to indicate your primary academic major in the

business school:

- *Accounting*
- *Finance*
- *Management*
- *Marketing"*

Research participants. In order to collect data for the purposes of fulfilling the

objectives of this dissertation effort, a population of undergraduate business school

students was identified. Initially, this study engaged the business student population of a

university in the Pacific Northwest region of the Unites States (hereafter referred to as

University X). University X provided a potential research population of 262 possible

participants, but data collection at that institution failed to achieve a statistically

significant sample. A second business student population was engaged at a university in

the Midwest region of the United States (hereafter referred to as *University A*). The

University A effort targeted those students that were well-established in their majors by

specifically soliciting upperclassmen (junior- and senior-level) enrolled in a capstone

strategic management course within this university's business school. As the goal of this

study was to determine if business discipline is an indicator of the effective use of

strategic learning concepts, it was important to engage a population of students that

provided sufficient variation among chosen specializations to provide reliable statistical

results. University A's business school offered the four distinct majors which aligned to

the four categories of the independent variable discriminator question: accounting,

finance, management, and marketing. Considering these parameters, University A

provided a target research population of 64 students. The instructor of the University A

strategic management class provided approval and access to the student research

population, thereby serving as the sponsor of the University A participants.

Sampling parameters. To select an appropriate sample from the established

undergraduate business student population, the following method for determining the size

of the sample as well as the procedure for eliciting responses from the population was

utilized. The equation below was applied to calculate the necessary sample size to

provide statistically significant results:

$$Sample\ Size\ (n) = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

(Survey Monkey, 2017). Given an estimated research population of 64 students as

potential subjects (N=64) across all disciplines, this study utilized a desired confidence

level of 95.0%, corresponding to a z-score of 1.96 (z=1.96). For the purposes of this

study, the highest acceptable margin of error was established at 5.0% (e=0.05), as this

would provide a level of precision adequate for reliable analysis. Finally, a population

proportion reflective of the variance expected among respondents within the population

was set at 50.0% (p=0.5). Based on these parameters, the calculated minimum sample

size (n) required for this study across all disciplines was 55 subjects (n=55).

Sampling was conducted electronically via e-mail and web-based methods. Two

separate web-based interfaces were utilized in order to separate participant information

regarding their business discipline and their LASSI responses. First, students received a

general solicitation e-mail providing them an internet link to a preliminary research

interface. This interface was powered by a third-party website (i.e.: Survey Monkey) and

collected participants' names and e-mail contact information. The preliminary interface

was also utilized to collect participant consent to the use of their LASSI result

information in this study, required subjects to indicate that they were over the age of 18,

and indicate that they were at least a junior within University A's business school.

Finally, subjects provided their answer to the discriminator question on the preliminary

interface website. Once this information was provided, participants proceeded to the

LASSI website as a second interface to provide their responses to the 60-item LASSI

survey through the LASSI's webpage infrastructure. An example of the layout of the

preliminary interface website can be found in Appendix C of this dissertation.

In order to encourage respondent participation, three main encouragement tactics

were pursued. First, the aforementioned general e-mail request was sent to the entire

research population at the beginning of the data collection period by the University A

sponsor, followed by a reminder message halfway through this timeframe. This message

contained information and instructions regarding how to complete the data collection

process, an internet link to the preliminary interface for students to provide their data and

connect to the LASSI survey, and details regarding the parameter for the motivator items

discussed below. Second, the sponsor was asked to encourage students to participate in

the study throughout the data collection period. A faculty script for this purpose was to be

provided to the sponsor by the researcher. Third, as an extrinsic motivator, all

respondents who provided usable data for this study were entered into a drawing to

receive one of ten gift cards to compensate them for their participation. The delivery of

these motivator items occurred after the data collection period had concluded. Examples

of the solicitation e-mail message and faculty script can be found in Appendices E and F,

respectively, at the end of this dissertation.

Financial budget. The financial budget for this study was estimated at $650.00

(Note: all prices in United States Dollars [USD]). Each iteration of the LASSI carried an

item cost of $1.50 each, with a proposed number of iterations not to exceed 100, equating

to a subtotal cost of $150.00. Additionally, the ten gift cards utilized as motivator items

for encouraging subject participation carried a cost of $50.00, for a subtotal of $500.00.

Combined, the total budget for this dissertation effort was estimated not to exceed

$650.00. This budget was funded in its entirety by the researcher. These figures are

denoted in Table 2 below:

Table 2

Summary Financial Budget for the Proposed Dissertation Effort

Item	Quantity	Unit Price	Subtotal Price
LASSI 3rd Edition (Web LASSI)	100	$1.50	$150.00
Motivator Item (Gift Cards)	10	$50.00	$500.00
Total Price:			$650.00

Research Approach to Data Collection

The research sample for this dissertation effort was to be determined via the

general solicitation e-mail request distributed to the entire population at the beginning of

the data collection period. The entire population of 64 students was solicited for their

feedback on the LASSI as well as their response to the discriminator question. In order

to obtain the desired precision for this study (margin of error $= e = 0.05$), the resulting

sample was therefore required to contain no less than 55 subjects.

Data Collection Procedure. Students in the research population were asked for their responses beginning September 19, 2017. The initial e-mail request for responses was sent to the research population on that date. A secondary e-mail request was sent to the population several days later in order to reinvigorate the population to respond by the end of the data collection period. The data collection period ended on September 26, 2017, providing the population one week (eight calendar days) to provide their input.

Data collection was conducted online via both the preliminary interface website and the LASSI website; this procedure is illustrated in Figure 2. The general solicitation email provided an internet link to the preliminary interface website. The preliminary interface was utilized to provide a mechanism to ensure participants had indicated their consent to the use of their information, their non-minor status, their standing as an upperclassman in the business school, and their response to the discriminator question. Information gathered here provided the independent variable data for the study, maintained a record of participant viability and consent, and collected contact information for the gift card drawing and distribution upon completion of the study. The preliminary interface served as the gateway for subjects to access the LASSI website, where they provided the dependent variable data required for this study.

STEP #1	STEP #2	STEP #3
Email Solicitation: 1. Invites subjects to participate in survey 2. Provides instructions 3. Explains gift card drawing for participation 4. Provides internet link to Preliminary Interface Website	Preliminary Interface Website: 1. Subjects indicate **consent** 2. Subjects indicate **non-minor status** (over 18 years of age) 3. Subject indicates **standing as academic junior or senior** 4. Subjects provide name and e-mail contact information 5. Subjects answer discriminator question 6. Subjects proceed via internet link to LASSI Website	LASSI Website: 1. Subjects provide first and last name 2. Subjects provide response to 60 LASSI survey items 3. Subjects submit responses

Figure 2: Data Collection Procedure

After entering the required data on the preliminary interface website, participants were electronically directed to the LASSI website. On this site, participants were required to provide first and last names as unique identifiers in order to prevent subjects from taking the LASSI survey multiple times. This first and last name data was utilized as a necessary link between student information from the preliminary interface and the LASSI data. Participants then answered the 60 questions in the LASSI survey and submitted their responses, completing the data collection process. The LASSI infrastructure consolidated all respondent data regarding subjects' percentile scores on the LASSI survey, and provided this data in a searchable data bank that could be accessed by the researcher via the internet.

The preliminary interface questions, LASSI survey, and discriminator question were all answered online and recorded electronically. Participants were required to have access to both an internet connection and a device to access that connection (personal computer, mobile device, etc.) in order to complete the data collection process. Participants utilized this device to provide their online responses within the data

collection period. The physical site and environment within which they choose to provide

their electronic responses was of their own choosing. It was estimated that participants

would require not more than 15 minutes to complete this process. As human subjects

were used in this study, a Human Subjects Review Committee (HSRC) was convened as

part of the researcher's dissertation process, whereby the study's procedures and design

were examined by a panel of experienced researchers within the researcher's degree-

granting university to ensure the physical and ethical safety of the subjects. The

committee established that the research effort being undertaken makes adequate provision

for protecting both the health and dignity of the subjects. The documentation of these

procedural processes and subsequent committee approvals of the HSRC proceedings can

be found in Appendix F. A signed individual consent form per subject was not required.

   Data Handling and Confidentiality. The LASSI percentile scores from each

respondent were recorded as interval data that served as the dependent variables for the

subsequent analysis of subject responses; the discriminator question provided nominal

data regarding subjects' business disciplines and served as the independent variable

during data analysis. Only the researcher was permitted access to the information on

either the preliminary interface or LASSI websites. The University A sponsor was

provided the names of those participating in the study for tracking purposes only, but was

not permitted to view the students' responses on either website interface. For the

purposes of this dissertation effort, only the subject's responses to the discriminator

question and their percentile scores for each LASSI subscale and were required to

conduct data analysis. The identifying data gathered from the preliminary interface

website was maintained only for the procedural needs of linking the interface data sets

and for the issuing the motivator items.

   With respect to confidentiality, respondents were required to provide their first

name, last name, and email address on the preliminary interface website for the

aforementioned procedural reasons (consent, identification of non-minor status, etc.).

Subjects also provided this same information on the LASSI website to enable a linkage

between the dependent and independent data sources. Once the researcher established

the linkage between subject data on the preliminary interface and the LASSI percentile

scores, the personally-identifying information from both sources was purged from the

data set to protect subject confidentiality. Further, no personally-identifying information

was published in the final data set for this dissertation or maintained beyond the

timeframe required to procedurally maintain a record of participant consent. No record

of any of this study's data was published with any participant's personally identifying

information, and no other linkage between participant identifying information and

responses of any kind was maintained or made public.

Research Approach to Data Analysis and Reporting

   Upon the completion of the data collection period of this dissertation effort, the

information gathered was reported in a Respondent Data Table with a layout similar to

the example found in Table 3 below. Upon final collection, this data underwent a

statistical analysis in order to test the hypotheses of this study.

Table 3

Example Respondent Data Table

Subject Number	Business Discipline	LASSI Scale Percentile Scores									
		ANX	ATT	CON	INP	MOT	SMI	SFT	TST	TMT	UAR
Subject #001	MGMT	30	90	30	90	80	80	80	20	80	50
Subject #002	FINA	10	100	90	90	80	40	100	40	20	30
Subject #003	ACCT	10	50	50	90	10	90	50	10	80	20
Subject #004	MKTG	50	10	50	50	10	20	20	30	70	80
Subject #005	ACCT	50	100	10	60	80	90	90	30	90	10
Subject #006	MKTG	70	70	10	50	10	60	80	90	30	100
Subject #007	FINA	70	80	10	50	80	70	70	40	80	30
Subject #008	MGMT	70	70	10	80	50	40	70	70	40	100
…	…	…	…	…	…	…	…	…	…	…	…
Subject #130	FINA	60	10	30	40	80	10	80	100	30	100
Subject #131	ACCT	30	90	30	90	80	80	80	20	80	50
Subject #132	MGT	60	90	40	80	80	10	40	50	30	80

To reiterate from Chapter 1, the hypotheses of this study are stated as follows:

H-1:
- H-1: There is a statistically significant difference among students of different business disciplines with respect to the **anxiety** learning attribute
- H-1$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **anxiety** learning attribute

H-2:
- H-2: There is a statistically significant difference among students of different business disciplines with respect to the **attitude** learning attribute
- H-2$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **attitude** learning attribute

H-3:
- H-3: There is a statistically significant difference among students of different business disciplines with respect to the **concentration** learning attribute
- H-3$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **concentration** learning attribute

H-4:
- H-4: There is a statistically significant difference among students of different business disciplines with respect to the **information processing** learning attribute

- H-4_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **information processing** learning attribute

H-5:
- H-5: There is a statistically significant difference among students of different business disciplines with respect to the **motivation** learning attribute
- H-5_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **motivation** learning attribute

H-6:
- H-6: There is a statistically significant difference among students of different business disciplines with respect to the **selecting main ideas** learning attribute
- H-6_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **selecting main ideas** learning attribute

H-7:
- H-7: There is a statistically significant difference among students of different business disciplines with respect to the **self -testing** learning attribute
- H-7_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **self -testing** learning attribute

H-8:
- H-8: There is a statistically significant difference among students of different business disciplines with respect to the **test strategies** learning attribute
- H-8_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **test strategies** learning attribute

H-9:
- H-9: There is a statistically significant difference among students of different business disciplines with respect to the **time management** learning attribute
- H-9_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **time management** learning attribute

H-10:
- H-10: There is a statistically significant difference among students of different business disciplines with respect to the **using academic resources** learning attribute
- H-10_0: There **no** a statistically significant difference among students of different business disciplines with respect to the **using academic resources** learning attribute

The purpose of this study was to determine if differences exist among students of differing business disciplines with respect to the application of strategic learning. The most effective way to test for these differences was to examine the learning attributes of a sample of these students through the use of the LASSI and analyze their results to check for statistical variances among their percentile scores regarding each LASSI scale. Considering this aim, this dissertation effort utilized an ANOVA of the means of the percentile scores for each scale to determine if any categorical grouping, based on the division of the data set by business discipline as determined by the discriminator question, was statistically different from the others for any scale. The ANOVA examination determined if any learning attribute for any business discipline grouping was more or less prevalent in that group when compared to the others. ANOVA testing thereby determined if there was any statistically significant difference in the learning attributes among students of different business disciplines, and subsequently indicated if any of the hypotheses could be supported. The ANOVA test was considered two-tailed, as the primary concern in this study regarded any variation, above or below, the mean value of any specific measure.

To test each hypothesis against the null, a separate one-way (single factor) ANOVA calculation was conducted on the data for each dependent variable (LASSI learning attribute) to determine the variation among the means both between and within the independent variable (business discipline) groupings. The variation computations consisted of the sum of squares and mean squares between and within each independent variable set. From these calculations the F-value for each dependent variable was derived. Utilizing the degrees of freedom established for each ANOVA calculation, a critical F-

value was determined for each test, as well as a p-value for each dependent variable

(Jones, n.d.).

The F-value for each dependent variable was analyzed against the critical F-value

derived for each ANOVA test to determine if the null hypothesis for that variable should

be rejected. If the F-value was greater than the critical F-value, the null could be rejected

for that dependent variable, thereby supporting the hypothesis corresponding to that

learning attribute. The p-values were also analyzed to determine the degree to which the

findings are significant, utilizing significance (alpha, or α) values of 5.0% ($p < 0.05$) and

1.0% ($p < 0.01$) for significant and very significant findings, respectively. These two

factors combined indicated the validity of each hypothesis by determining whether or not

to reject the null for each dependent variable test, and, if the hypothesis was supported,

the extent to which the findings were significant. A list of the statistical formulas that

were utilized in this ANOVA calculation process can be found in Appendix G of this

dissertation.

ANOVA analysis of the data set was conducted via the use of the Microsoft Excel

software program. The Microsoft Excel program, through the single-factor ANOVA

evaluation process, completed the mathematical calculations and provided all required

mean and variation values as well as the F-value and critical F-value for each dependent

variable test to determine whether or not to reject the null hypothesis for each learning

attribute. The program also provided p-values representing the significance of each

dependent variable tested; as aforementioned, for the purposes of this examination, p-

values under the alpha value of 5.0% ($p < 0.05$) and 1.0% ($p < 0.01$) were highlighted and

identified as significant and very significant findings, respectively, of this analysis.

When data for a particular learning attribute met the conditions for statistical

significance through ANOVA, a comprehensive series of post hoc tests were conducted

on the percentile score data for that learning attribute among all of the independent

variable groups (business disciplines). These tests determined where, or, more

specifically, to which discipline, the difference discovered within the ANOVA analysis

could be associated. Within any attribute where significance was established through

ANOVA, each business discipline was tested against the others in a pairwise fashion

utilizing multiple two-sample t-tests. Given the four disciplines being tested, this resulted

in a total of six t-tests required to comprehensively test each grouping against the others.

The p-value of each t-test was to be compared against the same significance/alpha

value as the ANOVA analysis (5.0%, or $p < 0.05$) to determine if the relationship between

the two independent variables being tested was significant. As this study was concerned

with any difference between two independent variables, regardless of this difference

being positive or negative, the two-tailed p-value for each t-test was to be examined for

comparison against the alpha value of 0.05. The analysis initially compared the two-

tailed p-value against unadjusted alpha for each of the six tests to be conducted; however,

this would potentially introduce the possibility of familywise error, also called alpha

inflation or cumulative type I error, that results from the likelihood that a false positive

result has occurred simply due to the number of tests being conducted (Newsom, 2006).

In order to adjust for this potential error, the t-test result analyses also

incorporated two statistical corrections to the alpha value commonly utilized when

multiple t-tests are conducted. The first of these corrections was a Bonferroni correction,

which reduces the alpha value for each test by applying a simple adjustment expressed as:

$$Bonferroni\ Adjusted\ \alpha = \frac{\alpha}{n}$$

(Weisstein, 2017), where α is the unadjusted significance value of 0.05, and n equals the

number of comparisons being tested, which, within this study, is six. This correction

stipulated that the Bonferroni-adjusted alpha value for these tests equal to 0.00833. This

adjustment reduced the alpha to decrease the likelihood of familywise type I errors.

The second correction utilized was a Sidak correction, which also reduces the

alpha for the comparison, but utilizes the following formula:

$$Sidak\ Adjusted\ \alpha = 1 - (1 - \alpha)^{1/c}$$

(Newsom, 2006), where α is the unadjusted significance value of 0.05, and c equals the

number of comparisons being tested, which, again, is six. This resulted in a Sidak-

adjusted alpha of 0.00851, which was mathematically close to the Bonferroni adjustment

and, likewise, reduced the overall alpha of the tests, decreasing the likelihood of a

familywise type I error.

All p-values for the pairwise t-tests performed post hoc on the data for any

learning attribute with significant ANOVA results were compared against all three

(unadjusted, Bonferroni-adjusted, and Sidak-adjusted) alpha values to validate the

significance of the t-tests results. A particular independent variable (business discipline)

was identified as the source associated with the significant mean difference identified

during ANOVA analysis when the three t-tests which involve that variable's data

indicated as significant when the p-values from those tests were compared against the

adjusted and unadjusted alphas. This result was sought during post hoc testing.

Effect size for each learning attribute data set was calculated with an eta-squared (η^2), or treatment sum of squares, measure of variance. This study was primarily concerned with the effect size between groups: specifically, the categorical groupings of students based upon their business discipline as determined by the discriminator question. An η^2 analysis indicated what proportion of the variance in the means observed in the ANOVA calculations was attributable to a predictor variable (in this study, a learning attribute percentile score), which verified how important that variable was in indicating a substantial difference among the means. This effect size determined how strong the relationship between the independent and dependent variables was within this study, and therefore demonstrated the relative level of effect business discipline had on the learning attributes of business students.

The η^2 for this analysis was determined by the following equation:

$$\eta^2 = \frac{Sum\ of\ Squares\ (Between\ Groups)}{Sum\ of\ Squares\ (Total)}$$

(Richardson, 2011).

In additional to the ANOVA results provide by the Microsoft Excel program, a graphical representation of the means of the percentile scores for each learning attribute was provided by business discipline in order to illustrate the collected data. The purpose of this step was to visually demonstrate the potential differences in the means of the learning attributes scores that each discipline measures through the LASSI data collection process. By illustrating the mean scores in a visual way, it was possible to more easily notice differences in the means between disciplines, thereby helping to identify any areas in which statistically significant findings might be present. A notional example of how

this graphical representation would appear after data collection is completed is found in

Figure 3 below.
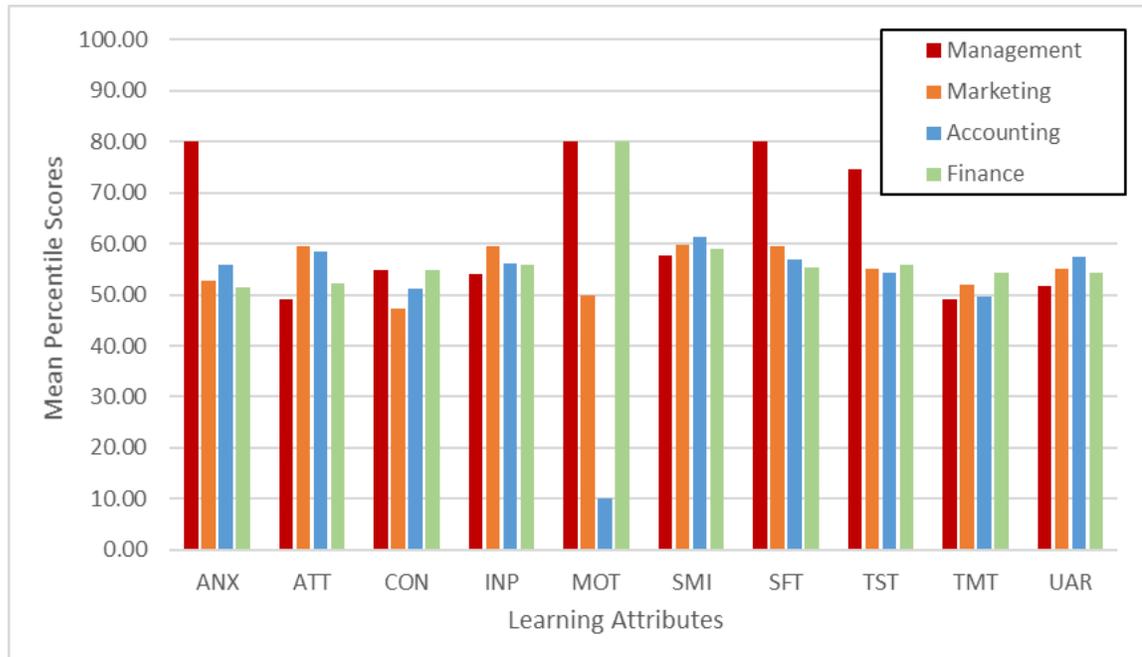
Figure 3: Mean Percentile Scores of Each Learning Attribute by Business Discipline

This graphical representation of the mean percentile scores for each learning

attribute worked as an aid to the ANOVA conduct on the data collected in this study to

help determine if differences existed with respect to learning attributes among the defined

business disciplines. The results of the ANOVA process produced findings that would

either support or fail to support the hypotheses of this dissertation, and determined to

what degree those findings are significant in a statistical sense. These findings and the

discussion regarding these results will be explored in Chapters 4 and 5 of this

dissertation, respectively.

Research Risks and Limitations

As with any study, the potential for researcher bias and the unintended compromising of the findings of this study through human influence and error did exist. This was uniquely specific to this study with respect to the pre-existing relationship between the researcher and University A and the utilization of this convenient relationship to achieve access to the research population. However, given the highly quantitative nature of this dissertation with respect to both the data collection process and the analysis of that data, it was unlikely that this human factor posed any significant risk to the research integrity of this effort. With the exception of the normal risks inherent in any study involving human subjects (see HSRC documentation in Appendix F of this dissertation), both the physical risk to study participants and the research risk to the study's results were both very low.

One other potential risk inherent to a study of this type was that of a self-reporting bias. In general, there is a tendency for subjects of research studies to provide responses that would enhance or promote their more desirable qualities and likewise discount their individual shortcomings (Donaldson & Grant-Vallone, 2002). With respect to this study, it was possible that students might be hesitant to respond honestly regarding their study habits, use of academic or library resources, and overall motivation for learning if, in fact, the subjects' level of academic engagement is relatively low. Students may have potentially inflated their responses on the LASSI survey to appear to be better students than they truly are. By maintaining confidentiality in the survey responses and encouraging students to thereby be as honest as possible in their answers to the questions, this bias was managed within this study to the fullest extent possible.

The most important limitation to the conduct of this specific study was the range and type of independent variables used to segregate the population and the sample used for data collection and analysis. Across the spectrum of business education throughout the U.S, most universities offer business degrees that can be categorized within four major areas of study: accounting, finance, marketing, and management. As such, these four areas were chosen as the demarcations for the business discipline categories, and the independent variables, utilized in this dissertation. These four major areas of specialization were by no means comprehensive or universal, and business education institutions may, and often do, have different majors and disciplines outside of this list which, if tested, would alter the outcomes that were determined as a result of this study. While this does not necessarily represent a bias within this research, it does have the potential to have an influence on the study's results. However, the four disciplines selected for this effort did represent a fairly consistent common core of business majors offered at most business schools within higher education overall. The limitation this fact places on the outcome of this study, from a research perspective, was minor.

Lastly, the attainment of an appropriate research sample presented a moderate risk to this study. Failure to attract the necessary number of participants for a sample size of n=55 would have possibly resulted in a margin of error greater than 5.0%, reducing the reliability of the results to be deemed representative of the population. This risk was mitigated through both the use of gift cards as motivator items to encourage participation among subjects at University A as well as the offering of extra credit within the sponsor's course. These steps were taken in order to avoid the need for collecting data from more

than one university population, a course of action that would have undoubtedly led to

greater confounding variability within the dataset.

Methodology Chapter Conclusion

The preceding chapter of this research proposal outlined how data was to be

collected and analyzed to determine findings that were examined against the overall

hypotheses of this study. These findings and how they either support or fail to support

the research hypotheses of this effort are explored in Chapter 4 of this dissertation. A

discussion of what these findings mean regarding the future of business education with

respect to discipline-based educational research comprises Chapter 5 of this overall work.

Chapter 4: Research Findings

The execution of the data collection process of this research effort followed the plan outlined in Chapter 3 to achieve a statistically significant sample. Once this sample was obtained, data analysis proceeded as described in the previous chapter, with each of the ten research hypotheses of this study tested for statistical significance. This chapter details the process by which the research sample and data for this study was materially obtained, the results produced by the analysis of this data, and the limitations, risks, and biases of these overall findings.

Data Collection Progression

The University A sponsor launched the solicitation email to the research population on September 19, 2017. Students in this population were offered extra credit within the sponsor's course in exchange for their participation, which, despite this motivational tactic, was still voluntary on that part of the participant. In total, the survey link was provided via a solicitation email to 64 students who comprise the total population, of whom 61 returned useable LASSI survey data sets within one week of initial contact, a response rate of 95.3%. This response rate created a statistically significant sample completely within the University A population; given a confidence level of 95% and a population proportion of variance equal to 0.5, the sample (n=61)

garnered from this population (N=64) was deemed representative of the population

overall with a margin of error equal to 2.7%. The University A data collection period

ended September 26, 2017. The University A data set can be viewed in its entirety in

Appendix H. A summary of the different business majors of the subjects which comprise

the University A sample can be viewed in Figure 4 below.
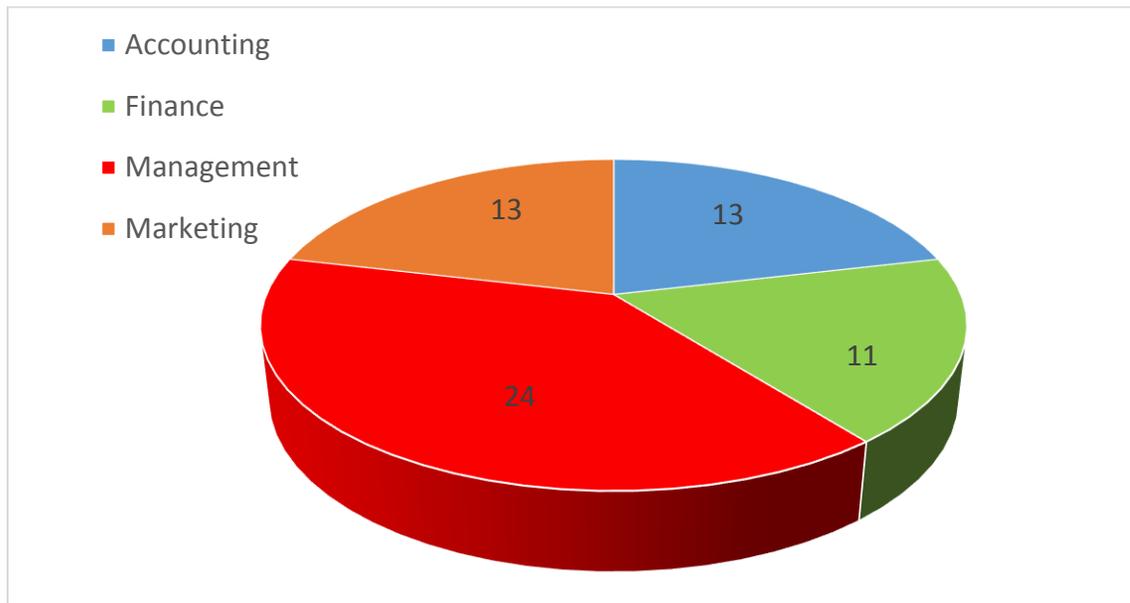
Figure 4: Summary of the Business Majors of the University A Research Sample

Findings and Data Analysis

Upon collection of the final data set of the University A participants, the mean

percentile scores for each business discipline/major (independent variable) grouping, as

well as the mean for the total population, were first calculated for each learning attribute

(dependent variable) category. These values are noted in Table 4, and are illustrated

graphically in Figure 5.

Table 4

Summary Mean Percentile Scores for University A Learning Attribute Data

Learning Attribute	Accounting	Finance	Management	Marketing	Total Sample
ANX	35.85	43.18	41.04	42.77	40.69
ATT	39.77	30.64	33.96	50.31	38.08
CON	42.46	44.09	41.42	38.46	41.49
INP	53.00	34.64	48.29	49.38	47.07
MOT	47.62	59.55	40.54	57.08	49.00
SMI	37.31	40.55	42.17	40.15	40.41
SFT	42.31	35.00	50.63	47.31	45.33
TST	43.46	50.00	42.33	49.23	45.43
TMT	48.15	47.45	38.38	42.08	42.89
UAR	23.31	31.00	33.46	42.00	32.67

Figure 5: Graphical Representation of Mean Percentile Scores for University A Learning Attribute Data

For each learning attribute category, a single factor (one-way) ANOVA

calculation was conducted on the percentile scores among all four disciplines, utilizing

these scores as dependent variable data and the subjects' business major responses as

independent variable data. The full ANOVA findings and statistics table for each

learning attribute can be found in Appendix I of this dissertation. Table 5 below details

the pertinent statistics resultant from the ANOVA calculations for each learning attribute

necessary to evaluate the hypotheses under consideration in this study.

Table 5

Summary of ANOVA Statistics for University A Learning Attribute Data

Learning Attribute	Sum of Squares Between Groups	Sum of Squares Within Groups	Sum of Squares Total	F-Value	Critical F-value	p-value
ANX	432.49	41882.59	42315.08	0.196	2.766	0.899
ATT	2998.01	44246.58	47244.59	1.287	2.766	0.287
CON	206.04	43581.20	43787.25	0.090	2.766	0.965
INP	2263.16	54218.58	56481.74	0.793	2.766	0.503
MOT	3813.31	61710.69	65524.00	1.174	2.766	0.328
SMI	200.23	57948.52	58148.75	0.066	2.766	0.978
SFT	2016.28	42329.16	44345.44	0.905	2.766	0.444
TST	698.05	51530.87	52228.92	0.257	2.766	0.856
TMT	1087.23	55182.97	56270.20	0.374	2.766	0.772
UAR	2316.72	48752.73	51069.44	0.903	2.766	0.445

* and ** used to indicate significant (p<0.05) and very significant (p<0.01) findings, respectively

Cursory analysis of these summary statistics indicated that none of the learning

attributes evaluated by the LASSI for the University A sample produced statistically

significant results in support of any of the ten hypotheses of this study. No single

ANOVA test produced an F-value greater than the critical F for the sample (2.766);

moreover, the resultant p-value for every dependent variable category ranged well above

the 0.05 threshold for significance. With regard each of the ten research hypotheses, the

data collected within this dissertation indicated a failure to reject the null hypothesis.

There was no indication of any statistically significant difference among students of

different business disciplines with respect to *any* learning attribute evaluated by the

LASSI. The hypotheses are evaluated discretely in Table 6 below, comparing each

category's statistics to their corresponding thresholds.

Table 6

Summary Evaluation of Hypotheses

H-#	Hypothesis and Null Hypothesis	F-Value (Critical F)	p-value (α)	Result
H-1:	• H-1: There is a statistically significant difference among students of different business disciplines with respect to the **anxiety** learning attribute • H-1$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **anxiety** learning attribute	0.196 (2.766)	0.899 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **anxiety** learning attribute
H-2:	• H-2: There is a statistically significant difference among students of different business disciplines with respect to the **attitude** learning attribute • H-2$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **attitude** learning attribute	1.287 (2.766)	0.287 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **attitude** learning attribute

H-#	Hypothesis and Null Hypothesis	F-Value (Critical F)	p-value (α)	Result
H-3:	• H-3: There is a statistically significant difference among students of different business disciplines with respect to the **concentration** learning attribute • H-3_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **concentration** learning attribute	0.090 (2.766)	0.965 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **concentration** learning attribute
H-4:	• H-4: There is a statistically significant difference among students of different business disciplines with respect to the **information processing** learning attribute • H-4_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **information processing** learning attribute	0.793 (2.766)	0.503 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **information processing** learning attribute
H-5:	• H-5: There is a statistically significant difference among students of different business disciplines with respect to the **motivation** learning attribute • H-5_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **motivation** learning attribute	1.174 (2.766)	0.328 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **motivation** learning attribute
H-6:	• H-6: There is a statistically significant difference among students of different business disciplines with respect to the **selecting main ideas** learning attribute • H-6_0: There is **no** statistically significant difference among students of different business disciplines with respect to the **selecting main ideas** learning attribute	0.066 (2.766)	0.978 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **selecting main ideas** learning attribute

H-#	Hypothesis and Null Hypothesis	F-Value (Critical F)	p-value (α)	Result
H-7:	• H-7: There is a statistically significant difference among students of different business disciplines with respect to the **self -testing** learning attribute • H-7$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **self -testing** learning attribute	0.905 (2.766)	0.444 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **self-testing** learning attribute
H-8:	• H-8: There is a statistically significant difference among students of different business disciplines with respect to the **test strategies** learning attribute • H-8$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **test strategies** learning attribute	0.257 (2.766)	0.856 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **test strategies** learning attribute
H-9:	• H-9: There is a statistically significant difference among students of different business disciplines with respect to the **time management** learning attribute • H-9$_0$: There is **no** statistically significant difference among students of different business disciplines with respect to the **time management** learning attribute	0.374 (2.766)	0.772 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **time management** learning attribute
H-10:	• H-10: There is a statistically significant difference among students of different business disciplines with respect to the **using academic resources** learning attribute • H-10$_0$: There **no** a statistically significant difference among students of different business disciplines with respect to the **using academic resources** learning attribute	0.903 (2.766)	0.445 (0.05)	Failure to reject the null hypothesis: **no** statistically significant difference indicated among students of different business disciplines with respect to the **using academic resources** learning attribute

As no learning attribute category within this evaluation produced statistically significant results upon ANOVA investigation, effect size calculation and post hoc testing as described in Chapter 3 was determined to be unnecessary to the overall findings of this effort. As no discernable differences among the business disciplines was indicated, establishing the source of the difference among the groupings would have been subsequently immaterial. Therefore, the pairwise t-test procedure was not conducted.

Supplemental Analysis: Alternative Method for Grouping Sample Data

The results of ANOVA testing on the data sample of this study indicated a failure to reject the null hypothesis for each learning attribute category evaluated by the LASSI. There was no statistically significant difference observed among the business disciplines examined. This examination divided the LASSI response data from the sample based on subjects' responses to the discriminator question as detailed in Chapter 3, aligning the participants into one of four business discipline groupings. These groupings were defined purely based on the participants' majors within their business school, which thereby led to the statistical findings which were used to evaluate the hypotheses of this study. For the purposes of both thoroughness and academic curiosity, a secondary analysis to address the fundamental question posed within this dissertation was conducted utilizing an alternative method for dividing the sample data into discipline groups. This method also utilized participants' responses to the discriminator question, but combined specific groupings using an alternative classification of business disciplines, thereby establishing a new set of independent variables to analyze. The following examination

briefly describes the analytical method utilized to alternatively divide the sample into

new discipline groups and the findings resultant from this analysis.

      According to research regarding business major selection conducted by Strasser,

Ozgur, and Schroeder (2004), students tend to cluster business majors into two groups,

with one group consisting of accounting, finance, and decision sciences, and the other

comprised of the marketing and management disciplines. This conclusion was the basis

for the method used within this supplemental analysis to alternatively divide the sample

data. Therefore, the four majors were aggregated into only two discipline groupings:

finance/accounting and marketing/management. All LASSI response data was combined

based on this new classification methodology, and the ANOVA process was repeated

utilizing only the finance/accounting and marketing/management groupings as the

independent variables.

      For the purposes of this supplemental analysis, only the independent variable

grouping criterion was adjusted. All other factors and parameters pertinent to this study's

methodology remained unchanged. The hypotheses utilized in the primary analysis were

also unchanged in this supplemental evaluation. Differences discovered among the two

business discipline groupings of finance/accounting and marketing/management

indicated a rejection of the null hypothesis for any learning attribute category, while a

lack of statistically significant differences indicated a failure to reject the null hypotheses.

Table 7 details the pertinent statistics resultant from this alternative ANOVA

examination. The full ANOVA results can be found in Appendix J.

Table 7

Summary of ANOVA Statistics for University A Learning Attribute Data Utilizing
Alternative Independent Variable Grouping

Learning Attribute	Sum of Squares Between Groups	Sum of Squares Within Groups	Sum of Squares Total	F-Value	Critical F-value	p-value
ANX	86.69	42228.39	42315.08	0.121	4.004	0.729
ATT	247.03	46997.56	47244.59	0.310	4.004	0.580
CON	116.58	43670.66	43787.25	0.158	4.004	0.693
INP	243.80	56237.94	56481.74	0.256	4.004	0.615
MOT	659.73	64864.27	65524.00	0.600	4.004	0.442
SMI	103.61	58045.15	58148.75	0.105	4.004	0.747
SFT	1605.30	42740.15	44345.44	2.216	4.004	0.142
TST	42.15	52186.77	52228.92	0.048	4.004	0.828
TMT	968.76	55301.44	56270.20	1.034	4.004	0.313
UAR	1348.92	49720.52	51069.44	1.601	4.004	0.211

* and ** used to indicate significant (p<0.05) and very significant (p<0.01) findings, respectively

As with the primary method for diving the sample into independent variable groupings, this alternative methodology produced no statistically significant findings. For each learning attribute category, no ANOVA calculation obtained a F-value greater than the critical F value for the sample (4.004), and each test's p-value was greater than the established alpha threshold for statistical significance (0.05). These findings indicated that, as was the case for the primary independent variable grouping method, the alternative independent variable discipline groupings of finance/accounting and marketing/management did not possess a statistically significant variance. This result further reinforces the conclusion that no statistically significant difference exists among students of different business disciplines with respect to any learning attribute category evaluated by the LASSI, regardless of the method used to classify the students into different discipline groupings.

Limitations, Risks, and Biases of Findings

One of the central limitations to the conduct of this study was the range and type of independent variables used to divide the sample. This research only focused on one variable, business discipline, as a method for segregating the sample and evaluating the difference in mean percentile scores among the various learning attributes of the LASSI. Other factors such as age, race, gender, socio-economic status, and regionality were not considered as areas of independent variability. Given that the sample was drawn from a population existing within a single course offering from one university, the potential for these other variables to influence the results was purposefully avoided. Given this parameter, it was subsequently impossible to determine if the findings of this study were indeed the result of the variable under examination or some other factor that was excluded from this analysis. As no significant findings were obtained, this point was inconsequential. Future studies should consider collecting a wider range of independent variable data to compare the results of testing these factors against the results of the business discipline variable with respect to student learning attributes.

The findings of this study were also limited significantly due to the relatively small sample size which comprised the final data set. The University A sample, while statistically significant and possessing a margin of error of less than 3.0%, was relatively small in terms of the total number of participants and the number of participants per discipline. With fewer than 25 response entries within each of the discipline groupings, any single subject providing a survey response even moderately outside the mean of the rest of the group had the potential to create drastic effect on the overall mean score for that major. While a much larger data set would normalize these outlier responses and

maintain a truer perspective of the mean of the discipline grouping, the influence of the

data from these deviant participants on a sample of this size may have been substantial.

In conjunction with this previous limitation, one major risk associated with the

findings of this research effort was that of inaccurate, disingenuous, or otherwise

unreliable responses from participants. This risk is inherent in any study where survey

responses are the primary means of providing data. There is always a chance that subjects

will rush to complete the survey rather than take the time to provide sincere and

thoughtful answers. This is especially true when extrinsic motivators are used to elicit

survey responses, as the subject may only desire to provide a complete response to earn

the potential reward without truly appreciating the accuracy of the response given. This

risk was likely present in this study considering the use of extra credit as an extrinsic

motivator from the University A sponsor to the research population. As students were

most likely motivated to respond to the LASSI simply to receive credit in their course, it

was very possible that at least some of the responses provided by the sample were not

truly reflective of the subjects' actual learning attributes, but were only provided in order

to complete the task to earn the extrinsic motivator. This fact, coupled with the

aforementioned limitation of a relatively small sample size, resulted in at least a

possibility that a small number of potentially unreliable survey responses had a

substantial influence on the mean percentile scores for the discipline groupings and the

sample overall. This may have had an indefinable impact on the ANOVA results

produced by this study.

As previously noted, both researcher and self-reporting biases were identified as

risks inherent to this study. Researcher bias was virtually eliminated from this effort

given the quantitative nature of the analysis conducted coupled with the separation

established between the researcher and the research population by utilizing the University

A sponsor as the primary interface with the study's participants. Self reporting bias,

became an even greater potential risk to this study upon the utilization of the University

A population. As the University A sponsor was an instructor with direct influence on the

participants' success in their coursework, there was an even greater potential than

previously established for the subjects to provide responses that would highlight their

positive qualities and disregard their flaws (Donaldson & Grant-Vallone, 2002). This

was controlled through an informational firewall, by which the University A sponsor was

not permitted to view individual participant responses, but the opportunity for this

potential bias was both existent and unavoidable. The effect of self-reporting bias on the

overall outcome of this study's results was and will remain unknown.

Research Findings Chapter Conclusion

The findings of this study indicated that there were no statistically significant

differences among students of different business disciplines with respect to any learning

attribute evaluated by the LASSI. Despite some inherent and controlled risks and biases

encountered throughout the conduct of this effort, the data findings and results for this

specific research sample did not provide any case for which the null hypothesis could be

rejected for any learning attribute category. The next and final chapter of this dissertation

discusses these findings in more granular detail to determine what can be learned from

this result, and, more importantly, what areas of future research could potentially advance

this body of knowledge.

Chapter 5: Discussion of Findings

The data collected and analyzed from the sample within this research effort indicated that there was no statistically significant difference among students of different business disciplines with respect to any learning attribute evaluated by the LASSI. Current literature regarding differentiation in higher education based upon disciplinary differences established many examples of educational concepts and tools that demonstrated measurable variances in the manner by which students of diverse business majors approach learning. The findings of this study supported a position that counters this notion, and were instead indicative of the idea that, with respect to the strategic learning construct, business discipline is not a worthwhile method for delineating business students and the subsequent approaches and interventions used to teach them. The comparison of the findings of this study and the conclusions of the existing literature therefore warranted further discussion on this topic.

Several areas of future research were discovered throughout this examination that may also provide greater understanding of the questions raised by this study. A deeper investigation into the data and analytical results of this effort exposed additional areas of academic interest that further learning attribute analysis may help to explain. The overall methodology utilized to collect and analyze the data within this study also warrants greater retrospection. The following chapter will explore three points of discussion

reflective of the conduct and findings of this study, first by examining what was learned

from the analysis of the sample data in comparison to the current literature, second by

briefly discussing the use of the methodology designed for this effort, and third by

considering what future research should be pursued to better understand the true nature of

the research question posed within this dissertation.

Insights and Implications from Findings

The analysis of the data collected in this study indicated that no statistically

significant differences among business disciplines existed with respect to any strategic

learning attribute. The conclusion drawn from this finding is that business discipline may

not be a worthwhile or useful method for delineating business students when applying the

strategic learning construct. A discussion regarding the implications of this study's

results and the relationship of these findings to the current literature constituted the basic

foundation of what was learned from the administration of this study, and established the

basis for the future research efforts that should follow.

This study's primary research focus was centered on the necessity to achieve

balance between the differentiation and integration of the strategic learning construct

within business higher education. Rejection of the null hypotheses of this study would

have constituted evidence of variance among the business disciplines with respect to the

learning attributes assessed by the LASSI, which would have subsequently advocated for

differentiation in terms of the interventions used to affect the education of business

students as diverse learners. The analysis of the data collected in this study indicated

failure to reject the null hypotheses, which instead supported the notion that a more

integrated approach to business education with respect to the implementation of strategic learning construct may be preferable.

Further integration of the various business disciplines with regard to learning attributes was a counterpoint to the current literature regarding business education from a disciplinary perspective. Most studies which evaluated the use of any specific educational concept or tool against the variability of student learners from diverse business majors found statistically significant differences among the disciplines. Islam and Islam (2013) found that extra-normal ability in both micro- and macroeconomics affected the performance of finance and management students, but only microeconomics affected the capability of marketing students, and neither affected the ability of accounting students. Burke, James, and Ahmadi (2009) discovered that the use of technology (i.e.: MS PowerPoint) was more effective in qualitative courses, such as marketing and management, than it was in quantitative courses such as finance. Shoemaker and Kelly (2015) explored the visual, auditory, and kinesthetic learning styles among varied business discipline and determined that finance and marketing students preferred visual approaches, while management students preferred kinesthetic methods. Loo (2002b) utilized Kolb's learning styles and found that accounting, finance, and management students preferred the assimilator style and marketing students supported the converger style. Nicholson and DeMoss (2009) discovered that the perceived amounts of social responsibility and ethics integration into major coursework is significant and varied among accounting, finance, marketing, and management majors. Regarding the practical application of academic differentiation, Arbaugh et al. (2009) identified and explored many notable disciplinary differences in modern business education literature,

and the National Research Council (NRC) (2012) defined the term discipline-based

education research (DBER) when regarding the use of this same paradigm in science

education. In summary, all of these studies advocated for a greater and more involved

use of disciplinary differences to drive educational outcomes.

      The overall conclusion of this study demonstrated that differences among

business majors with respect to strategic learning were simply not great enough to

warrant diversifying the approaches utilized among them. The result contrasted the

current literature regarding disciplinary differences among business majors which

advocated for greater differentiation. Instead, this finding supported the notion that more

holistic and integrated business education focused on the learning attribute commonalities

among different business majors may be desirable. The existing literature supported a

stance where deeper disciplinary approaches built around the unique specialty aspects of

each concentration may be the most effective method for advancing business education.

The findings of this study did not support this position, and indicated that, with respect to

the strategic learning construct, the differences among the disciplines were not great

enough to justify such differentiation. This study provided an argument against the

common conception within the current literature that business disciplines are inherently

diverse and should therefore be differentiated in terms of the approaches used to

implement learning tools and concepts. Only by continuing this research can the proper

balance between differentiation and integration be known completely.

Methodology Effectiveness

Overall, the methodology for data collection and analysis detailed in Chapter 3 was successful in testing the hypotheses of this study. The parameters established for calculating sample size, the alpha values utilized to determine significance, and the corrections stipulated to mitigate the risk of familywise type I errors in post hoc testing all strengthened and reinforced the analytical method developed for this study. These factors all contributed to determining whether or not to support the hypothesis for each learning attribute category assessed by the LASSI. The LASSI itself functioned well and as designed, and the data collection procedure utilizing the online interfaces detailed in the previous chapter worked seamlessly and efficiently. Though data collection was materially difficult due to external constraints which limited subject participant and subsequently resulted in a lower than expect sample size, the general process outlined for the administration of this study was effective.

It is possible that characteristics of the research population and the sample drawn from it may have influenced the findings in a manner beyond which this study was able to anticipate or control. For this reason, replicative studies are recommended in order to further define the validity of the findings of this effort. Future studies aiming to replicate the conduct of this research effort should follow a procedure congruent to the one established within this dissertation, maintaining the analytical limits and dependent variable bounds whenever appropriate.

Areas of Future Research

There is still a great deal more investigation that must be completed to understand the full scope of the implications that the strategic learning construct may have on shaping the future of learning and teaching in business higher learning. These follow-on areas of research are comprised of four primary considerations. The first is that of replicative studies. Research efforts designed and modeled after this dissertation will provide more data and greater depth to either reinforce or refute the findings of this study. Second, an exploration of what the lack of variance, or potential variance discovered in follow-on efforts, among the disciplines with respect to strategic learning means and how it might affect the conduct of business higher education is both logical and warranted. Third, although findings of the current research did not demonstrate statistically significant differences, comparative studies might consider the speculative tendencies shown in the percentile scores for the business discipline groupings when constructing future research aimed at exploring the relationships among business majors collectively across all ten LASSI scales. Fourth and finally, longitudinal studies capturing the same type of data as this current effort throughout the academic career of the business learner, and potentially beyond, should be considered to develop a greater understanding of how learning attributes among students may change over time. These four areas will be discussed in the final section of this work.

Replicative Studies. Undoubtedly, the most important area for continued research with respect to this study is the development of a larger and more detailed data set with which to further test the hypotheses stated within it. The 61-subject sample collected to test these conjectures was sufficient to assess the validity of the methodology

proposed and provide an analysis of a very limited population of business students. In order to more effectively verify the supportability, or lack thereof, of the hypotheses of this effort, much more data must be collected and analyzed.

Future replicative studies mirroring the methodology used in this dissertation should focus on the collection of data at larger universities with sufficiently-sized business schools to support adequate sampling. Within this research effort, the size of the overall sample, as well as the size of each discipline group within that sample, may have been a limiting factor to achieving statistically significant results. More robust samples obtained from larger populations may provide data sets with greater potential to overcome this limitation, and these samples should be sought in lieu of data collected from smaller, less-developed participant pools. The aggregation of a series of several of these adequately large samples, ideally from diverse regions, could constitute a suitable research stream which would provide the necessary data to more effectively test the hypotheses postulated in this current study and help understand the research questions posed within it.

The ideal population for replicative studies should consist of students from diverse racial, ethnic, geographic, and socio-economic backgrounds that are homogenously spread across the disciplines utilized as independent variables. Diversity in this regard will reduce the risk of these factors introducing confounding variability that could challenge the integrity of the analysis of business discipline as the principal independent variable. Other demographic data, such as student age and gender, could also be collected to enrich the data set and allow for subsequent studies to examine other independent variables that may influence strategic learning in business education. Just as

this dissertation was modeled after the Sizoo et al. (2003) study which examined age and gender as the principal independent variables, so could future studies examine and cross-examine these different variables in conjunction with business discipline to enrich the overall quality of their eventual findings.

In addition, special attention should be paid to the method utilized for dividing the sample with respect to the independent variable groupings utilized. As previous stated, using a strict by-major approach versus an aggregated discipline method (i.e.: accounting/finance and management/marketing) has been shown to produce different results upon ANOVA testing. Both the primary and alternative independent variable grouping approaches demonstrated in this dissertation require replication in order to fully understand the relationship between business discipline and strategic learning attributes.

Exploratory Studies. Further research in this area will either corroborate the findings of this study or attain statistically significant results and indicate differences in learning attributes among the business disciplines. The next logical progression in this line of academic questioning, regardless of the outcome of the replicative efforts which may follow, is to determine how this information could be leveraged to achieve better learning outcomes for business students. The purpose of this study was to utilize the *diagnostic* aspect of the LASSI to determine if differences among the business disciplines exist with respect to the strategic learning construct (Weinstein et al., 2016). Further research would be necessary to utilize the *prescriptive* aspect of the LASSI within the strategic learning theory to recommend interventions that would help to shape student learning and thereby affect better achievement and overall learning outcomes, either by differentiating approaches based upon discovered differences in learning attributes or

integrating intervention methods due to a lack of meaningful variance among the different business disciplines.

The interventions, including changes to learning strategies on the part of educators and improvements self-regulated study employed by students (Weinstein et al., 2016), would be influenced by the findings of these subsequent studies, allowing the interventions to be tailored to the specific learning attribute needs and deficiencies identified through the LASSI process. This tailoring process would itself be the true research required to realize the benefit of the diagnostic-prescriptive progression. It should include exploration into the types of interventions that can be used to correct behaviors and leveraged to enhance positive learning qualities in the event differences are invariably found, or an understanding of the characteristics that represent the typical student learner within business education overall in the case of a more integrated approach consistent with the lack of statistically significant variance found in this study.

Comparative Studies of Tendencies of the Mean Percentile Scores. The data provided by the research sample was analyzed with respect to each learning attribute category on an attribute-by attribute basis, but little consideration was given to the tendencies of the relationships between the mean percentile scores for each of the independent variable groupings across all ten attribute scales altogether. Cursory observational analysis of the mean percentile scores with regard to all of the scales considered collectively demonstrated some notable behaviors among the four business disciplines which may warrant further examination in future research efforts. Table 8 lists the mean percentile score for each business discipline and for the sample as a whole for each learning attribute category. This is accompanied by a listing of the relative

relationships between each discipline's mean and the mean for the total sample for each

grouping.

Table 8:

Summary Mean Percentile Scores for University A Learning Attribute Data

Learning Attribute	Accounting Discipline Mean	Finance Discipline Mean	Management Discipline Mean	Marketing Discipline Mean	Total Sample Mean
ANX	35.85	43.18	41.04	42.77	40.69
ATT	39.77	30.64	33.96	50.31	38.08
CON	42.46	44.09	41.42	38.46	41.49
INP	53.00	34.64	48.29	49.38	47.07
MOT	47.62	59.55	40.54	57.08	49.00
SMI	37.31	40.55	42.17	40.15	40.41
SFT	42.31	35.00	50.63	47.31	45.33
TST	43.46	50.00	42.33	49.23	45.43
TMT	48.15	47.45	38.38	42.08	42.89
UAR	23.31	31.00	33.46	42.00	32.67

Summary Relationships Between Discipline Means and Total Sample Means

Learning Attribute	Accounting	Finance	Management	Marketing
ANX	-4.84	2.49	0.35	2.08
ATT	1.69	-7.45	-4.12	12.23
CON	0.97	2.60	-0.08	-3.03
INP	5.93	-12.43	1.23	2.32
MOT	-1.38	10.55	-8.46	8.08
SMI	-3.10	0.14	1.76	-0.26
SFT	-3.02	-10.33	5.30	1.98
TST	-1.96	4.57	-3.09	3.80
TMT	5.27	4.57	-4.51	-0.81
UAR	-9.36	-1.67	0.79	9.33

To determine the discipline-total sample relationship, the total sample mean was

subtracted from discipline mean percentile score for each category to derive a value that

demonstrated both the relative relationship (positive indicating a discipline mean greater

than the mean for the sample, negative indicating discipline mean less than mean for the

sample) and the magnitude (the closer to zero, the less the discipline score differed from

the total sample mean) of the difference between the two means. The result of these

calculations allowed for observational examination of the relative difference of each

discipline mean to the total sample mean for each learning attribute category. Through

this examination, several outcomes were noted which may indicate tendencies suitable

for further research.

The discipline-total sample relationship procedure revealed the evident condition

that very few of the discipline means differed meaningfully from the total mean for the

sample for any learning attribute category. Only nine of the 40 discipline mean scores

differed by more than 6.0 percentile points, positively or negatively, from the total

sample mean for their respective categories. Upon examination, two possible tendencies

regarding the behavior of particular business disciplines were observed within this

information that could potentially provide a basis for subsequent research efforts. These

tendencies are more easily observed via a graphical representation of the Table 8 data,

which can be found in Figure 6. In this figure, the total sample mean is denoted by an x

for each learning attribute category, while the box represents an arbitrary range of +/- 6.0

percentile points from this sample mean score. The colored circles represent the mean

percentile scores for each discipline.
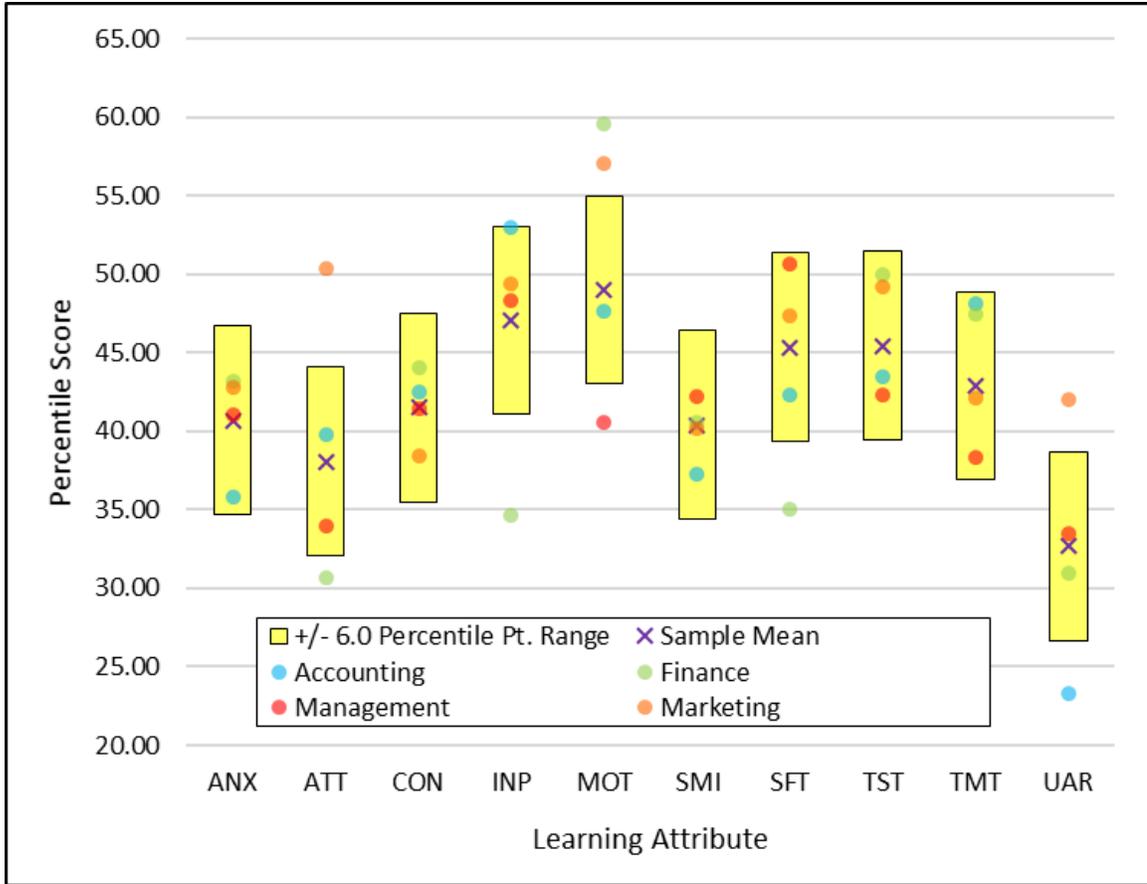
Figure 6: Mean Percentile Score by Business Discipline and Total Sample Mean with +/- 6.0 Percentile Point Range

The graphic illustrates that the management and accounting disciplines possessed mean percentile scores that normally fell within +/- 6.0 percentile points of the mean for the sample for each learning category, with only one mean for each discipline (motivation for management and using academic resources for accounting) falling below the -6.0 percentile point lower bound. However, the other disciplines' mean percentile scores possessed characteristics that were more tendency-oriented and thereby possibly more appropriate for additional consideration in future studies.

The first notable tendency pertained to the finance business discipline. The mean percentile scores for this discipline fell outside the arbitrary +/- 6.0 percentile point range with a greater frequency than any other major, with four occurrences observed in the attitude, information processing, motivation, and self testing categories. The instances of these outliers tended to differ from the total sample mean with greater magnitude than what was observed in the other disciplines, with three of these four occurrences being +/- 10 percentile points from the mean for the sample. This observation indicates that the mean LASSI percentile scores for the finance major may tend to differ from the total mean percentile score for the entire sample more often and to a greater extent than other business disciplines within any specific learning attribute category. This observation could potentially be considered when generating hypotheses for studies subsequent to this effort.

The second tendency observed through this examination occurred with respect to the marketing discipline. The mean discipline percentile score for the marketing major fell outside the arbitrary +/- 6.0 percentile score range on three occasions (within the attitude, motivation, and using academic resources scales), and on each occasion, the discipline mean score was higher than the mean for the total sample. The mean percentile score for the marketing major was found to be higher than the sample mean in seven of the ten learning attribute categories. These observations combined may indicate that the mean LASSI percentile scores for the marketing discipline will tend to fall above the mean for the total sample for any learning attribute category in future studies. As with the first tendency, this observation may be a consideration when developing conjectures for follow-on research efforts in this area.

Longitudinal Studies. In order to observe and understand changes in learning attributes over time and, in a simultaneous fashion, explore the effect of the transition from the educational to practical environment on these scales, longitudinal studies among business students utilizing the LASSI as an instrument of the strategic learning construct should be attempted. This study focused on capturing LASSI percentile score data from upperclassmen (junior and senior class students) for the purposes of ensuring that the scores obtained were reflective of the learning attributes of students who accurately represented their disciplines. Assessing learning attributes across the normal, four-year academic progression of the typical business undergraduate student may provide insights into how learning attributes within business disciplines change throughout this timeframe. Collecting this type of longitudinal data and conducting the corresponding research regarding the nature of these changes could help shape and refine learning interventions to affect better outcomes not just among the discipline groups, but within each discipline with respect to the academic-year standing of the student.

Opportunities could exist for capturing data regarding learning attributes from business professionals after they leave the higher education environment. Through a modification of the current LASSI to revalidate the instrument as a usable tool for collecting data from business practitioners, it would be possible to develop a data set that not only tracks students' learning attribute data throughout their undergraduate academic progressions, but also collects similar data throughout their professional careers, including graduate education, specialized training, and industry certification processes.

This expanded longitudinal data set would allow researchers to better understand the implications of business learning beyond the university setting. Research in this area

would broaden the body of knowledge concerning business learning and complete the feedback cycle between education and practice, supporting the application of the DBER concept postulated by the National Research Council (NRC) (2012) to the modern business environment. The complication in this respect would be revalidating the LASSI as an instrument for use beyond academia and correlating practitioner scoring and results to those of the current, student-focused assessment. This may prove too complex a challenge to make this future research effort truly feasible, but, if conducted, it could serve as a fundamental bridge between the academic and practical aspects of business education, enriching the relationship between the learning and execution of business lessons and philosophies.

Discussion of Findings Chapter and Dissertation Conclusion

This dissertation determined if academic discipline was an appropriate target for the application of the strategic learning construct within business higher education. The findings of this study indicated that none of the mean percentile scores of the four business majors of accounting, finance, marketing, and management were significantly different with respect to the ten learning attributes which comprise the concept of strategic learning. The conclusion drawn from these findings was that business discipline may not be an effective or worthwhile method for delineating business students with respect to the implementation of strategic learning. The findings provided a suitable response to this study's research problem, but replicative and continued subsequent research efforts will be necessary in order to fully and comprehensively answer this study's overarching question.

Business education in the modern higher learning environment confronts a challenge faced by many other institutions: the continual dichotomy between integration and differentiation (Lawrence & Lorsch, 1970). Business schools must consistently strive to balance the need to fit the normal paradigm of university-level instruction with simultaneously diversifying the manner and conduct of teaching business students based on their unique requirements and proclivities. This study defined an original method for differentiating business education by examining the differences in how business students learn, and progress in this regard was indeed made, but there is still much left to understand. By continuing this line of academic inquiry and remaining persistent in the pursuit of answers to these questions, this understanding can and will be achieved, shaping the landscape of business education for future generations of learners.

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Appendix A

Definitions of the Learning Attributes and Study Strategies Inventory (LASSI) Scales

Anxiety (ANX)

The **Anxiety Scale** assesses the degree to which students worry about school and their academic performance. Students who score low on this scale are experiencing high levels of anxiety associated with school. High levels of anxiety can help direct attention away from completing academic tasks (sample item: Worrying about doing poorly interferes with my concentration on tests). Students who score low on this scale may need to develop techniques for coping with anxiety and reducing worry so that attention can be focused on the task at hand.

Attitude (ATT)

The **Attitude Scale** assesses students' attitudes and interest in college and academic success. It examines how facilitative or debilitative their approach to college and academics is for helping them get their work done and succeeding in college (sample item: I feel confused and undecided as to what my educational goals should be). Students who score low on this scale may not believe college is relevant or important to them and may need to develop a better understanding of how college and their academic performance relates to their future life goals.

Concentration (CON)

The **Concentration Scale** assesses students' ability to direct and maintain attention on academic tasks (sample item: I find that during lectures I think of other things and don't really listen to what is being said). Low scoring students may need to learn to monitor

their level of concentration and develop techniques to redirect attention and eliminate interfering thoughts or feelings so that they can be more effective and efficient learners.

Information Processing (INP)

The **Information Processing Scale** assesses how well students' can use imagery, verbal elaboration, organization strategies, and reasoning skills as learning strategies to help build bridges between what they already know and what they are trying to learn and remember, i.e., knowledge acquisition, retention and future application (sample item: I translate what I am studying into my own words). Students who score low on this scale may have difficulty making information meaningful and storing it in memory in a way that will help them recall it in the future.

Motivation (MOT)

The **Motivation Scale** assesses students' diligence, self-discipline, and willingness to exert the effort necessary to successfully complete academic requirements (sample item: When work is difficult I either give up or study only the easy parts). Students who score low on this scale need to accept more responsibility for their academic outcomes and learn how to set and use goals to help accomplish specific tasks.

Selecting Main Ideas (SMI)

The **Selecting Main Ideas Scale** assesses students' skill at identifying important information for further study from among less important information and supporting details (sample item: Often when studying I seem to get lost in details and can't see the forest for the trees). Students who score low on this scale may need to develop their skill at separating out critical information on which to focus their attention. Tasks such as reading a textbook can be overwhelming if students focus on every detail presented.

Self-Testing (SFT)

The **Self-Testing Scale** assesses students' use of reviewing and comprehension monitoring techniques to determine their level of understanding of the information to be learned (sample item: I stop periodically while reading and mentally go over or review what was said). Low scoring students may need to develop an appreciation for the importance of self-testing, and learn effective techniques for reviewing information and monitoring their level of understanding or ability to apply what they are learning.

Test Strategies (TST)

The **Test Strategies Scale** assesses students' use of test preparation and test taking strategies (sample item: In taking tests, writing themes, etc., I find I have misunderstood what is wanted and lose points because of it). Low scoring students may need to learn more effective techniques for preparing for and taking tests so that they are able to effectively demonstrate their knowledge of the subject matter.

Time Management (TMT)

The **Time Management Scale** assesses students' application of time management principles to academic situations (sample item: I only study when there is the pressure of a test). Students who score low on this scale may need to develop effective scheduling and monitoring techniques in order to assure timely completion of academic tasks and to avoid procrastination while realistically including non-academic activities in their schedule.

Using Academic Resources (UAR)

The **Using Academic Resources** assesses students' willingness to use different academic resources such as writing centers, tutoring centers and learning or academic support

centers, when they encounter problems with their coursework or performance (sample item: I am not comfortable asking for help from instructors in my courses). Students who score low on this scale may need help identifying and effectively using resources as the need for learning assistance becomes apparent.

Appendix B

Learning Attributes and Study Strategies Inventory (LASSI) Survey Instrument

Questions

Instructions: *Try to answer according to how well the statement describes you, not how you think you should be or what others do. There are no right or wrong answers to these statements. Please work as quickly as you can without being careless and please answer all the items.*

1. Even when study materials are dull and uninteresting, I manage to keep working until I finish.
    - o Not at all typical of me
    - o Not very typical of me
    - o Somewhat typical of me
    - o Fairly typical of me
    - o Very much typical of me

    (*Note- choice of responses identical for each question; removed for subsequent questions for clarity)

2. When it is difficult for me to complete a course assignment, I do not ask for help.

3. I try to find relationships between what I am learning and what I already know.

4. I find it hard to stick to a study schedule.

5. In taking tests, writing papers, etc., I find I have misunderstood what is wanted and lose points because of it.

6. I concentrate fully when studying.

7. When I am struggling in one or more courses, I am too embarrassed to admit it to anyone.

8. When I decide to study, I set aside a specific length of time and stick to it.

9. During class discussion, I have trouble figuring out what is important enough to put in my notes.

10. To help me remember new principles we are learning in class, I practice applying them.

11. When it comes to studying, procrastination is a problem for me.

12. If I am having trouble with a writing assignment, I seek help from resources available at my college such as the writing center, learning center, or tutoring center.

13. I find it difficult to maintain my concentration while doing my coursework.

14. I only study the subjects I like.

15. When preparing for an exam, I create questions that I think might be included.

16. I have difficulty identifying the important points in my reading.

17. When work is difficult, I either give up or study only the easy parts.

18. To help me learn the material presented in my classes, I relate it to my own general knowledge.

19. There are so many details in my textbooks that it is difficult for me to find the main ideas.

20. I review my notes before the next class.

21. I have difficulty adapting my studying to different types of courses.

22. I translate what I am studying into my own words.

23. I put off studying more than I should.

24. Even if I am having difficulty in a course, I can motivate myself to complete the work.

25. My mind wanders a lot when I study.

26. I stop periodically while reading and mentally go over or review what was said.

27. I am not comfortable asking for help from instructors in my courses.

28. I feel very panicky when I take an important test.

29. I have a positive attitude about attending my classes.

30. When I study for a test, I have trouble figuring out just what to do to learn the material.

31. Even if I do not like an assignment, I am able to get myself to work on it.

32. I would rather not be in school.

33. I set goals for the grades I want to get in my classes.

34. When I am taking a test, worrying about doing poorly interferes with my concentration.

35. I try to see how what I am studying would apply to my everyday life.

36. I have trouble understanding exactly what a test question is asking.

37. I worry that I will flunk out of school.

38. To help make sure I understand the material, I review my notes before the next class.

39. I do not care about getting a general education, I just want to get a good job.

40. I find it hard to pay attention during lectures.

41. I try to relate what I am studying to my own experiences.

42. I dislike most of the work in my classes.

43. I review my answers during essay tests to make sure I have made and supported my main points.

44. When studying, I seem to get lost in the details and miss the important information.

45. I do not put a lot of effort into doing well in my courses.

46. If I find that a course is too difficult for me, I will get help from a tutor.

47. I am very easily distracted from my studies.

48. It is hard for me to decide what is important to underline in a text.

49. To check my understanding of the material in a course, I make up possible test questions and try to answer them.

50. Even when I am well prepared for a test, I feel very anxious.

51. I set aside more time to study the subjects that are difficult for me.

52. I test myself to see if I understand what I am studying.

53. Courses in certain subjects, such as math, science, or a foreign language, make me anxious.

54. I end up "cramming" for every test.

55. When I listen to class lectures, I am able to pick out the important information.

56. When I am studying, worrying about doing poorly in a course interferes with my concentration.

57. I do poorly on tests because I find it hard to plan my work within a short period of time.

58. If I get distracted during class, I am able to refocus my attention.

59. In my opinion, what is taught in my courses is not worth learning.

60. When I do not understand how to use a method or procedure presented in one of my courses, I ask another student to teach me so that I can do it on my own.

Appendix C

Preliminary Interface Website

WELCOME TO THE LASSI GATEWAY

Thank you for your participation!

Thank you for participating in this study. Please answer the questions below before being directed to the Learning And Study Strategies Inventory (LASSI) survey webpage. Your participation in this survey is respectfully requested but <u>not required</u>, and you may choose to discontinue your participation in this study at any time. The survey should take no more than 10 minutes to complete. Each participant providing complete responses to this survey will be entered into a drawing to receive <u>one of ten $50.00 Amazon gift cards</u>. Winners will be selected randomly and gift cards will be distributed at the end of the survey period.

* 1. Do you consent to your information being used in this study?

◯ I consent

* 2. Are you 18 years of age or older?

◯ Yes

* 3. Are you an academic junior or senior in your university's business school?

◯ Yes

<u>Please note:</u> your responses to all questions throughout this survey process are confidential, and your name data will not be maintained or associated with your responses once all the survey information has been collected and compiled; however, if you wish to use an alias ("made-up" or fictitious name) as your first and last name input, you may do so, but **please ensure you are consistent with the use and spelling of that name throughout the survey process**. Your email information is optional, but failure to provide a working email address will disqualify you from the gift card drawing.

* 4. What is your first name?

[   ]

* 5. What is your last name?

[   ]

WELCOME TO THE LASSI GATEWAY

Thank you for your participation!

6. What is your email address? (Note- for prize distribution only. If you do not wish to be entered in the drawing for the gift card, you do not need to provide an e-mail address)

[   ]

* 7. Choose one of the following to indicate your primary academic major in the business school:

○ Accounting

○ Finance

○ Marketing

○ Management

WELCOME TO THE LASSI GATEWAY
LASSI SURVEY

The link below will take you to the LASSI survey.

Please follow these directions explicitly to ensure the confidentiality of your responses.

1. Click the link below to access the survey

2. You are required to provide your first name and last name ONLY prior to taking the survey in the spaces provided. **<u>As before, you may use an alias or fictitious name for</u> <u>your response, but please ensure you use the same name and spelling on the</u> <u>survey website that you used on the previous page.</u>**

3. Provide your individual answers to the 60 questions of the survey

4. Submit your responses

Please click on the following link to be directed to the LASSI Survey:
http://www.collegelassi.com/lassi/lassi.html?invnum=81011&ak=gfu&u=wy6g&p=8w

Appendix D

General Solicitation E-mail

PARTICIPATE IN A RESEARCH STUDY BY TAKING A 10-MINUTE SURVEY, BE ENTERED TO WIN A $50 GIFT CARD!

Greetings!

You are invited to participate in a research study that will determine the learning attributes of business school students with respect to their preferred business disciplines. By receiving this email, you have been designated for voluntary inclusion in this study. **Your participation in the following survey which supports this research effort is respectfully requested but not required, and you may choose to discontinue your participation in this study at any time. The survey should take no more than 10 minutes to complete.** This study's procedures have been reviewed by a Human Subjects Review Committee (HRSC) through George Fox University and approved for use in this effort.

To participate, take the actions listed below. **Please follow these directions explicitly to ensure the confidentiality of your responses**.

1. Click the following link to access the gateway for the survey, provided by Survey Monkey (https://www.surveymonkey.com/r/HX5FHND). You will provide your consent for your information to be used in this study, certify that you are at least 18 years of age, and indicate that you are at least an academic junior. You will then provide your name and contact e-mail information. **Please note: your responses to all questions throughout this survey process are confidential, and your name data will not be maintained or associated with your responses once all the survey information has been collected and compiled; however, if you wish to use an alias ("made-up" or fictitious name) as your first and last name input, you may do so, but please ensure you are consistent with the use and spelling of that name throughout the survey process. Your email information is optional, but failure to provide a working email address will disqualify you from the gift card drawing.** You will also be required to provide an answer to the following question:

    Choose one of the following to indicate your primary academic major in the business school:

    - ***Accounting***
    - ***Finance***
    - ***Management***
    - ***Marketing***

2. After completing this page and answering the above question, you will then be directed to a second website to provide your responses to the short, 10-minute survey. You are required to provide your first name and last name prior to taking the survey. **As before, you may use an alias or fictitious name for your response, but please ensure you use the same name and spelling on the survey website that you used on the previous gateway page**

3. Provide your individual answers to all 60 questions of the survey
4. Submit your responses
5. Each participant providing a valid email address and complete responses to this survey will be entered into a drawing to receive **one of ten $50.00 Amazon gift cards**. Winners will be selected randomly and gift cards will be distributed at the end of this survey period

Please complete this survey no later than **Friday, September 29, 2017**. Thank you very much for your participation.

Appendix E

Faculty Encouragement Script

Dear Colleague,

I am completing a research study for my doctoral dissertation. The students in your

section have been identified as potential subjects in my research, and I require their

participation in a survey e-mailed to them from the director of undergraduate programs to

complete my study. Detailed instructions are included in the e-mail; however, I

respectfully request that you kindly remind and encourage your students to take the time

to complete this survey.

If possible, please read the following message to your class periodically

throughout the data collection period (September 4th-Sepetmeber 29th, 2017):

"Students, you have been e-mailed a link to participate in a research study. By

participating, you will be entered into a drawing to win one of ten $50 Amazon gift

cards. To participate, please follow the instructions on the e-mail message to complete

the survey in its entirety. Thank you."

Thank you very much for your time and assistance in helping my complete my

study. It is most appreciated.

Very respectfully,

-Dan Thoman

Appendix F

George Fox University Human Subject Review Committee (HSRC) Application and

Approval

GEORGE FOX
SCHOOL OF BUSINESS

HUMAN SUBJECTS REVIEW COMMITTEE

PROTECTION OF HUMAN SUBJECTS INITIAL REVIEW QUESTIONNAIRE

[Note: Dissertation, or other formal research proposal, need not be submitted with this form. However, relevant section(s) may need to be attached in some cases, in addition to filling out this form completely, but only when it is not possible to answer these questions adequately in this format. Do not submit a proposal in lieu of filling out this form. In addition, review carefully the full text of the Human Subjects Research Committee Policies and Procedures on page 4 of the Research Manual.]

Date submitted: | Apr 21, 2017 | Date received: | |

Title of Proposed Research: Understanding Business Education: Examining the Effect of the Application of Strategic Learning Among Diverse Business Disciplines

Principal Researcher(s): Daniel Thoman

Degree Program Doctor of Business Administration

Rank/Academic Standing Doctoral Candidate

Other Responsible Parties (if a student, include faculty sponsor; list other involved parties and their role) Tim Rahschulte, Doctoral Committee Chair

(***Please include identifying information on page 6 also**.)

(1) Characteristics of Subjects (including age range, status, how obtained, etc):

This proposed study will engage the student population of a large, public university in the Mid-Atlantic region of the United States with an electronically-delivered survey regarding the participants' learning attributes. This study will specifically target those students enrolled in the entry-level courses of the business school within this university, ranging in age from approximately 18 to 22 years old.

This university's business school offers five distinct majors for its students, aligning to five categories of dependent variability: accounting, finance, ISOM, management, and marketing; the goal is to achieve a disparity among these disciplines while providing a sufficient number of potential participants for each specialization. The approximate population of students fitting within these established criteria at this university is 600 total potential subjects. Access to the student research population will be obtained via convenient relationships between the researcher and the business school's foundational courses department and primarily conducted via e-mail solicitation.

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(2) Describe any risks to the subjects (physical, psychological, social, economic, or discomfort/ inconvenience):

The survey utilized to gather respondent data is a 60-question instrument called the Learning and Study Strategies Inventory (LASSI). This instrument requires subjects to provide responses on a five-point Likert scale for 60 inventory items, and should require no more than 15 minutes to complete. Respondents will also be required to provide their first and last names as well as information regarding their major or area of greatest academic interest. Provided these conditions cause respondents no undue stress or inconvenience, there are no material physical, psychological, social, economic, or discomfort/inconvenience risks to the subjects of this study.

(3) Are the risks to subjects minimized (a) by using procedures which are consistent with sound research design and which do not unnecessarily expose subjects to risk, and (b) whenever appropriate, by using procedures already being performed on the subjects for diagnostic or treatment purposes?

Degree of risk: 1 2 3 4 5 6 7

low **high**

1

(4) Briefly describe the objectives, methods and procedures used:

The objective of this study is to test a sample of university-level business students to determine if their business discipline (major or area of greatest academic interest) is an indicator of their learning attributes within the strategic learning construct. To do this, a sample will be selected from within the aforementioned research population, which will be determined via an e-mail request distributed in August of 2017. The entire population of approximately 600 students will be solicited for their feedback on the LASSI, as well as an indication of their business discipline. The data collection period will last approximately 30 days and a target sample size of n=235. Respondents will provide their inputs via an on-line interface with the LASSI website with responses recorded electronically; participants must have access to both an internet connection and a device to access that connection in order to complete the data collection process. Participants will utilize this device to provide their on-line responses within the data collection period; the physical site and environment within which they provide their electronic responses will be of their own choosing. The resulting data set compiled from subject responses will include respondent business disciplines as well as their percentile scores for each of learning attribute as determined by the LASSI. This dataset will be statistically analyzed to determine if differences exist among the scores for any of the learning attributes tested by the LASSI.

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(5) Briefly describe any instruments used in the study (**attach a copy of each**).

The LASSI, as defined within its user's manual by Weinstein, Palmer, and Acee, (2016), "is a 10-scale, 60-item assessment of students' awareness about and use of learning and study strategies related to skill, will and self-regulation components of strategic learning" (p. 6). The instrument requires subjects to provide responses on a five-point Likert scale for 60 inventory items related to test-taking and study strategies, and returns standardized percentile scores across ten scales which correspond to ten specific learning attributes: Information Processing, Selecting Main Ideas, Test Strategies, Anxiety, Attitude, Motivation, Concentration, Self Testing, Time Management, Using Academic Resources

A copy of the inventory items of the LASSI (3rd edition) is attached to this form.

(6) How does the research plan make adequate provision for monitoring the data collected so as to insure the safety, privacy and confidentiality of subjects?

With respect to confidentiality, respondents will be required to provide their first name, last name, and email address on the LASSI assessment for data tracking purposes only, and this information will not be published in the final data set of this dissertation or maintained outside of the internal LASSI database hosted by the LASSI web administrator service. No record of any of this study's data shall be published with any participant's personally identifying information, and no other linkage between participant identifying information and responses of any kind shall be maintained or made public.

(7) Briefly describe the benefits that may be reasonably expected from the proposed study, both to the subject and to the advancement of scientific knowledge – are the risks to subjects reasonable in relation to anticipated benefits?

This study will either support or fail to support the hypothesis that business discipline is an effective delineation criteria among business students with respect to the application of strategic learning. If statistically significant differences among the means of the learning attribute LASSI scores of different disciplines exists, it supports the idea that segregating business students along disciplinary lines might be an effective target for the utilization of strategic learning interventions. This could thereby lead to further studies regarding how these interventions could be effective if implemented properly, but only if the differences themselves can first be identified. This potential benefit significantly outweighs the very negligible risk to the subjects of this study.

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(8) Where some or all of the subjects are likely to be vulnerable to coercion or undue influence (such as children, persons with acute or severe physical or mental illness, or persons who are economically or educationally disadvantaged), what appropriate additional safeguards are included in the study to protect the rights and welfare of these individuals?

None of the participants of this study are likely to be vulnerable to coercion or undue influence; therefore, no additional safeguards are being considered.

(9) Does the research place participants "at risk"? No   If so, describe the procedures employed for obtaining **informed consent** (*in every case, attach copy of informed consent form; if none, explain*).

Participants are not at risk in this study; no informed consent from participants is required.

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Title:

Understanding Business Education: Examining the Effect of the Application of Strategic Learning

Among Diverse Business Disciplines

Principal
Researcher(s): Daniel Thoman

Date application completed: Apr 21, 2017

COMMITTEE FINDING:

_____ 1) The proposed research makes adequate provision for safeguarding the health and dignity of the subjects and is therefore approved.

_____ 2) Due to the assessment of risk being questionable or being subject to change, the research must be periodically reviewed by the HRSC on a _____
basis throughout the course of the research or until otherwise notified. This requires resubmission of this form, with updated information, for each periodic review.

_____ 3) The proposed research evidences some unnecessary risk to participants and therefore must be revised to remedy the following specific area(s) of non-compliance:

_____

_____

_____

_____ 4) The proposed research contains serious and potentially damaging risks to subjects and is therefore not approved.

Chair or designated member _____   Date 4/28/17
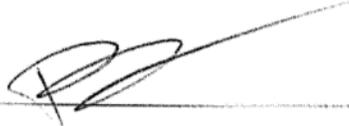
Appendix G

Formulas Utilized in Analysis of Variance (ANOVA) Variation and Value Calculations

Grand Mean: $$\bar{X}_{GM} = \frac{\sum x}{N}$$

Total Variation: $$SS(T) = \sum(\bar{x} - \bar{X}_{GM})^2$$

Between Group Variation: $$SS(B) = \sum n(\bar{x} - \bar{X}_{GM})^2$$

Within Group Variation: $$SS(W) = \sum(n - 1) * s^2$$

Mean Square Between Groups: $$MS(B) = \frac{SS(B)}{k-1}$$

Mean Square Within Groups: $$MS(BW) = \frac{SS(W)}{N-k}$$

F-value: $$F = \frac{MS(B)}{MS(W)}$$

Where: x = data values (percentile scores)
$\bar{x}$ = mean score per grouping (discipline)
n = number of scores per grouping (discipline)
N = number of total scores
s^2 = variance per grouping (discipline)
k = number of groupings (disciplines)

Appendix H

University A Full Data Set: Subject Business Majors and LASSI Percentile Scores

Subject Number	Business Discipline	LASSI Scale Percentile Scores									
		ANX	ATT	CON	INP	MOT	SMI	SFT	TST	TMT	UAR
Subject #1	Accounting	20	90	90	85	90	95	65	99	75	30
Subject #2	Accounting	50	35	65	1	90	45	10	65	95	80
Subject #3	Accounting	30	65	50	35	50	20	20	55	70	25
Subject #4	Accounting	35	99	90	45	75	60	40	30	80	1
Subject #5	Accounting	65	65	45	25	30	45	15	50	35	15
Subject #6	Accounting	65	15	50	20	15	45	15	55	45	30
Subject #7	Accounting	15	1	1	99	65	5	65	30	1	60
Subject #8	Accounting	15	45	20	80	65	15	65	15	5	10
Subject #9	Accounting	75	80	90	99	99	99	70	95	90	15
Subject #10	Accounting	55	10	30	15	15	20	50	25	70	30
Subject #11	Accounting	10	1	5	60	5	1	40	1	25	5
Subject #12	Accounting	1	10	15	80	5	20	40	40	25	1
Subject #13	Accounting	30	1	1	45	15	15	55	5	10	1
Subject #14	Finance	80	1	45	35	60	20	10	65	45	1
Subject #15	Finance	60	30	30	45	60	60	50	65	25	45
Subject #16	Finance	10	45	30	80	75	85	40	65	70	80
Subject #17	Finance	60	20	50	45	30	70	20	65	75	35
Subject #18	Finance	10	1	5	5	60	5	20	25	1	10
Subject #19	Finance	55	45	50	25	99	20	50	65	55	15
Subject #20	Finance	30	5	20	5	1	1	5	10	1	15
Subject #21	Finance	30	20	75	50	85	85	75	65	70	10
Subject #22	Finance	35	55	45	85	60	30	70	5	20	75
Subject #23	Finance	40	35	60	5	75	40	40	55	70	45
Subject #24	Finance	65	80	75	1	50	30	5	65	90	10
Subject #25	Management	60	45	10	45	10	25	70	30	35	45
Subject #26	Management	60	10	45	15	10	85	40	75	20	1
Subject #27	Management	10	80	60	25	75	1	15	55	45	45
Subject #28	Management	5	45	65	99	90	20	99	65	45	75
Subject #29	Management	15	1	5	20	5	10	10	1	1	5
Subject #30	Management	40	30	20	45	20	25	35	15	45	15
Subject #31	Management	40	55	75	50	75	60	85	75	70	60
Subject #32	Management	80	99	99	25	99	99	75	85	40	15
Subject #33	Management	10	10	45	35	40	25	90	65	45	45
Subject #34	Management	55	15	45	75	40	55	65	75	25	15
Subject #35	Management	85	35	20	80	40	10	35	30	10	55
Subject #36	Management	35	30	45	80	40	90	15	15	40	1
Subject #37	Management	20	20	15	25	1	1	1	1	1	25
Subject #38	Management	25	5	25	80	30	45	20	25	15	10

Subject #39	Management	75	55	85	85	99	95	95	95	90	90
Subject #40	Management	80	55	80	75	99	95	95	99	99	99
Subject #41	Management	5	55	15	60	30	5	65	5	80	25
Subject #42	Management	25	10	10	15	20	25	70	15	15	60
Subject #43	Management	80	15	50	45	50	85	35	40	25	15
Subject #44	Management	25	45	60	5	40	1	5	5	35	1
Subject #45	Management	40	10	30	15	5	25	40	50	40	25
Subject #46	Management	70	30	35	15	40	55	70	65	70	60
Subject #47	Management	15	55	35	80	5	45	35	5	5	1
Subject #48	Management	30	5	20	65	10	30	50	25	25	15
Subject #49	Marketing	60	99	60	80	99	30	85	85	90	90
Subject #50	Marketing	60	45	45	35	20	30	50	10	60	15
Subject #51	Marketing	60	45	65	20	85	60	65	65	60	90
Subject #52	Marketing	50	45	15	65	10	10	20	40	1	25
Subject #53	Marketing	1	35	35	90	60	1	90	40	95	1
Subject #54	Marketing	30	45	35	45	30	70	20	65	10	10
Subject #55	Marketing	90	10	5	1	75	55	65	50	10	10
Subject #56	Marketing	5	10	5	1	5	10	10	10	1	25
Subject #57	Marketing	1	55	45	80	40	40	40	25	20	85
Subject #58	Marketing	5	65	5	35	30	1	15	5	25	15
Subject #59	Marketing	35	80	80	95	99	90	70	90	85	90
Subject #60	Marketing	99	65	20	20	99	45	50	80	20	35
Subject #61	Marketing	60	55	85	75	90	80	35	75	70	55

Appendix I

University A Full ANOVA Results

ANOVA: Single Factor for Anxiety (ANX)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	466	35.8462	572.6410
Finance	11	475	43.1818	516.3636
Management	24	985	41.0417	723.8678
Marketing	13	556	42.7692	1099.8590

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	432.4873	3	144.1624	0.1962	0.8986	2.7664
Within Groups	41882.5947	57	734.7824			
Total	42315.0820	60				

ANOVA: Single Factor for Attitude (ATT)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	517	39.7692	1322.3590
Finance	11	337	30.6364	610.2545
Management	24	815	33.9583	650.0417
Marketing	13	654	50.3077	610.3974

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2998.0095	3	999.3365	1.2874	0.2875	2.7664
Within Groups	44246.5807	57	776.2558			
Total	47244.5902	60				

ANOVA: Single Factor for Concentration (CON)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	552	42.4615	1138.6026
Finance	11	485	44.0909	474.0909
Management	24	994	41.4167	685.1232
Marketing	13	500	38.4615	784.9359

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	206.0419	3	68.6806	0.0898	0.9654	2.7664
Within Groups	43581.2040	57	764.5825			
Total	43787.2459	60				

ANOVA: Single Factor for Information Processing (INP)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	689	53.0000	1103.0000
Finance	11	381	34.6364	890.4545
Management	24	1159	48.2917	814.3895
Marketing	13	642	49.3846	1112.2564

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2263.1570	3	754.3857	0.7931	0.5028	2.7664
Within Groups	54218.5807	57	951.2032			
Total	56481.7377	60				

ANOVA: Single Factor for Motivation (MOT)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	619	47.6154	1227.2564
Finance	11	655	59.5455	707.4727
Management	24	973	40.5417	1060.0851
Marketing	13	742	57.0769	1293.9103

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3813.3144	3	1271.1048	1.1741	0.3277	2.7664
Within Groups	61710.6856	57	1082.6436			
Total	65524.0000	60				

ANOVA: Single Factor for Selecting Main Ideas (SMI)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	485	37.3077	1006.8974
Finance	11	446	40.5455	909.2727
Management	24	1012	42.1667	1133.9710
Marketing	13	522	40.1538	890.9744

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	200.2320	3	66.7440	0.0657	0.9779	2.7664
Within Groups	57948.5221	57	1016.6407			
Total	58148.7541	60				

ANOVA: Single Factor for Self Testing (SFT)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	550	42.3077	465.0641
Finance	11	385	35.0000	620.0000
Management	24	1215	50.6250	957.2880
Marketing	13	615	47.3077	710.8974

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2016.2792	3	672.0931	0.9050	0.4444	2.7664
Within Groups	42329.1635	57	742.6169			
Total	44345.4426	60				

ANOVA: Single Factor for Test Strategies (TST)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	565	43.4615	943.4359
Finance	11	550	50.0000	585.0000
Management	24	1016	42.3333	1022.4928
Marketing	13	640	49.2308	903.5256

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	698.0462	3	232.6821	0.2574	0.8558	2.7664
Within Groups	51530.8718	57	904.0504			
Total	52228.9180	60				

ANOVA: Single Factor for Time Management (TMT)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	626	48.1538	1119.3077
Finance	11	522	47.4545	973.0727
Management	24	921	38.3750	737.3750
Marketing	13	547	42.0769	1255.0769

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1087.2291	3	362.4097	0.3743	0.7718	2.7664
Within Groups	55182.9677	57	968.1222			
Total	56270.1967	60				

ANOVA: Single Factor for Using Academic Resources (UAR)

SUMMARY

Groups	Count	Sum	Average	Variance
Accounting	13	303	23.3077	570.0641
Finance	11	341	31.0000	748.0000
Management	24	803	33.4583	855.9982
Marketing	13	546	42.0000	1228.6667

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2316.7151	3	772.2384	0.9029	0.4455	2.7664
Within Groups	48752.7276	57	855.3110			
Total	51069.4426	60				

Appendix J

University A Full ANOVA Results Utilizing Alternative Independent Variable Grouping

ANOVA: Single Factor for Anxiety (ANX)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	941	39.2083	537.2156
Management and Marketing	37	1541	41.6486	829.7898

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	86.6912	1	86.6912	0.1211	0.7291	4.0040
Within Groups	42228.3908	59	715.7354			
Total	42315.0820	60				

ANOVA: Single Factor for Attitude (ATT)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	854	35.5833	976.8623
Management and Marketing	37	1469	39.7027	681.3814

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	247.0271	1	247.0271	0.3101	0.5797	4.0040
Within Groups	46997.5631	59	796.5689			
Total	47244.5902	60				

ANOVA: Single Factor for Concentration (CON)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	1037	43.2083	800.8678
Management and Marketing	37	1494	40.3784	701.4084

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	116.5849	1	116.5849	0.1575	0.6929	4.0040
Within Groups	43670.6610	59	740.1807			
Total	43787.2459	60				

ANOVA: Single Factor for Information Processing (INP)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	1070	44.5833	1049.9928
Management and Marketing	37	1801	48.6757	891.3363

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	243.7963	1	243.7963	0.2558	0.6149	4.0040
Within Groups	56237.9414	59	953.1854			
Total	56481.7377	60				

ANOVA: Single Factor for Motivation (MOT)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	1274	53.0833	984.7754
Management and Marketing	37	1715	46.3514	1172.6231

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	659.7342	1	659.7342	0.6001	0.4416	4.0040
Within Groups	64864.2658	59	1099.3943			
Total	65524.0000	60				

ANOVA: Single Factor for Selecting Main Ideas (SMI)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	931	38.7917	923.3895
Management and Marketing	37	1534	41.4595	1022.4219

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	103.6065758	1	103.6066	0.1053	0.7467	4.0040
Within Groups	58045.14752	59	983.8161			
Total	58148.7541	60				

ANOVA: Single Factor for Self Testing (SFT)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	935	38.9583	526.0417
Management and Marketing	37	1830	49.4595	851.1441

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1605.2951	1	1605.2951	2.2160	0.1419	4.0040
Within Groups	42740.1475	59	724.4093			
Total	44345.4426	60				

ANOVA: Single Factor for Test Strategies (TST)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	1115	46.4583	757.6504
Management and Marketing	37	1656	44.7568	965.5781

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	42.1489	1	42.1489	0.0477	0.8280	4.0040
Within Groups	52186.7691	59	884.5215			
Total	52228.9180	60				

ANOVA: Single Factor for Time Management (TMT)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	1148	47.8333	1007.1884
Management and Marketing	37	1468	39.6757	892.6697

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	968.7553	1	968.7553	1.0335	0.3135	4.0040
Within Groups	55301.4414	59	937.3126			
Total	56270.1967	60				

ANOVA: Single Factor for Using Academic Resources (UAR)

SUMMARY

Groups	Count	Sum	Average	Variance
Finance and Accounting	24	644	26.8333	637.9710
Management and Marketing	37	1349	36.4595	973.5330

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1348.9201	1	1348.9201	1.6007	0.2108	4.0040
Within Groups	49720.5225	59	842.7207			
Total	51069.4426	60				