ABSTRACT

John Dixon Boyles, THE NAMING OF THE PARTS: AN ASSOCIATIVE STUDY OF WRITING RELEVANT KNOWLEDGE, WORKING MEMORY, AND CURRICULUM POTENTIAL (Under the direction of Dr. Cheryl McFadden) Department of Educational Leadership, April 2013.

This study was designed to identify and to test a model to assist educational leaders to develop quantifiable assessments of student learning to meet the requirements for institutional assessment by external stakeholders and to produce data essential to plan specific curriculum and program improvements. The study population included English composition students at a small community college in eastern North Carolina. Data collected included test scores related to a terminology exam and also semester grades in courses that comprise a two-semester composition sequence. The study applies a conceptual framework that incorporates elements of working memory and curriculum potential to consider the possible relationships between the terminology exam and composition courses.

The first research question examined the association between student scores on the terminology exam and student semester grades for the course. The second research question examined the association between student scores and semester grades in subsequent composition courses. The research methodology employed in this study was quantitative in design. Statistical analysis was performed to determine demographic influences on student academic performance. Rasch modeling was also employed to examine exam characteristics, including item difficulty. Results indicated that academic excellence in composition courses was associated with a score of 80+ on the terminology exam by students. The results of this study indicate that an examination of foundational concepts through a five-step process to evaluate curriculum potential can provide educational leaders with quantifiable assessments of student learning as required for institutional assessment and with data meaningful to curriculum and program improvement.

THE NAMING OF THE PARTS: AN ASSOCIATIVE STUDY OF WRITNG RELEVANT

KNOWLEDGE, WORKING MEMORY, AND CURRICULUM POTENTIAL

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CHAPTER 1: INTRODUCTION

Educational leaders face considerable challenges, not the least of which is the necessity to respond to the external demand for accountability that has resulted in an increased emphasis on institutional assessment in all areas including student learning and curriculum. The first national conference on assessment was held in 1985 (Ewell, 2002). Since that time, educational leaders have spent much energy and resources in an effort to manage the complex relationship between assessing student learning outcomes and responding to external demands for accountability. The current emphasis on assessment complicates curriculum debates, in part because of two differing views of the purpose of assessment (Note: as used in this study, the term assessment refers to institutional assessment such as required by regional accrediting agencies, rather than individual student assessment.). Ewell (2009) observes that faculty tend to see assessment as an inward process aimed at improvement while administrators are likely to see assessment in terms of accountability to external stakeholders. The task of identifying and evaluating assessment practices that will satisfy the needs of both administrators and faculty is made even more difficult by other factors. For instance, faculty control of curriculum matters in higher education has been a commonly accepted best practice for so long that it has been codified in the requirements of regional accrediting agencies including the Southern Association of Colleges and Schools (SACS). For this reason, educational leaders are hesitant to intrude too deeply into curriculum matters despite pressure to do just that. Educational leaders who perform both administrative and faculty functions are perhaps best positioned to satisfy both the internal and external demands of assessment although available research examining how best to accomplish that goal is limited.

Faculty members who accept administrative positions such as department chairs often find themselves confronted with conflicts arising from their dual roles as scholar/teacher and manager/leader (Sirkis, 2011). However, previous research has examined curriculum practices and assessment primarily from either a faculty or an administrative perspective. The lack of research on community college department chairs is particularly acute. A search of the ERIC and dissertation databases between 1999-2005 resulted in only seven articles focusing on community college department chairs (Craig, 2005). Sirkis (2011) states that chairs are "both bridge and buffer between the academic department and the college's administration" (p. 49). Craig (2005) notes that the lack of organizational standardization among community colleges has led to inconsistency in titles and that the term department chair might variously be referred to as chair, head, coordinator, assistant dean, or dean. For the sake of clarity, this dissertation will use the term department chair with the understanding that such a title carries with it an administrative requirement to lead faculty. Given the important leadership role performed by department chairs and the lack of available research, a clear need exists for studies designed to identify strategies through which department chairs can lead faculty initiatives to improve curriculum while also satisfying the administrative necessity to provide quantifiable assessments to external stakeholders. The purpose of this study is to identify a strategy that will accomplish the duel objective of curriculum improvement and institutional assessment.

Background of Study

Many curriculum issues arise from public and political demands for accountability. The need for quantifiable assessment of student learning presents challenges for faculty and educational administrators alike (Ewell, 2009). This demand affects multiple stakeholder groups, both internal and external, many of whom hold differing concepts of what constitutes effective

institutional assessment. Two primary points of recent emphasis are assessing the economic value of a college education and assessing what students actually learn in attaining a degree, i.e. student learning outcomes (United States Department of Education, 2006). An additional complication arises from the two distinct purposes of assessment, the first directed inward for improvement, the second outward for accountability (Ewell, 2009). Traditionally, the task of demonstrating the economic value of a college education has fallen largely to educational administrators, if anyone, while the task of assessing student learning has been almost exclusively the concern of faculty who may be resistant to assessment by external agencies (Hutchings, 2010). However, as the demand for accountability has continued to grow, so has the pressure on educational administrators to exert a more formative influence in curriculum affairs (Scott, 2012; Stark, Briggs, & Rowland-Poplawski, 2002; Stark & Latucca, 1997). The result is that administrative, as well as faculty, roles in curriculum planning are being redefined (Scott, 2012). There is considerable evidence that educational administrators, not to mention many faculty, possess little formal training in curriculum development and assessment (Stark, 2002). Further, the body of available research indicates that faculty who become administrators such as department chairs are likely to possess strong disciplinary knowledge but little managerial experience.

Some history is necessary to establish the context for understanding current challenges facing educational leaders serving dual roles as administrators and faculty. Colleges have historically performed an expanding number of roles (Thelin, 2004). As the number of professions and fields of research requiring specialized training have increased, college curriculums have become correspondingly complex and varied. Predictably, the complexity of these curricula gave rise to an increasingly specialized faculty as well as a subsequent increase in

faculty professionalization (Cohen, 1998). One can generalize that curriculum development during this period, which included most of the 20th century, was (and continues to be) characterized by faculty control. Loosely coupled academic departments possessed considerable freedom to determine both content and assessment methods, and the role of administrators, often former faculty themselves, was largely that of coordinator, at least in curricular affairs (Cohen, 1998; Stark et al., 2002). However, trends in recent years such as an emphasis on corporate styles of management have begun to cut into faculty autonomy and the concept of shared governance and have increased the role that administrators are expected to play in areas previously left to faculty (Scott, 2012).

In addition to the declining role of faculty in campus governance (AAUP, 2011; Scott, 2012), there exist impediments to uniform curriculum assessments that would easily satisfy the external demand for institutional assessment. Perhaps the largest challenge in establishing common curriculum assessments arises from the differing epistemological traditions that exist within specific disciplines. Latucca and Stark (1994, 2009) identified patterns uncovered by surveys conducted by the Association of American Colleges (AAC) as part of a curricular reform initiative, the findings of which were part of a two volume series published in 1990-91 intended to help foster the "coherence" of general education curriculums. The data collected suggest that in disciplines such as mathematics and sciences curricular coherence is easily established because "scholars build a knowledge base systematically" (Latucca & Stark, 1994, p. 419). However, in fields such as the humanities and social sciences, the process for acquiring knowledge is more recursive than linear. Such "iterative" research strategies "pursue knowledge in several directions simultaneously, leaving room for curriculum diversity" (Latucca & Stark, 1994, p. 419). Research has demonstrated that the differing nature of scholarly research within

different disciplines typically affects both the type of course content and also the pedagogical content of curriculums within those disciplines (Lattuca & Stark, 2009, 1994). These differences have implications for assessment. The types of assessment used to measure student learning outcomes derived from course content must be determined by the nature of that content in order to be effective. For instance, to assess a writing outcome requires a different instrument than to assess a computational outcome. The humanities, and to a lesser extent the social sciences, are often criticized for their lack of practical value (Garland, 2012). One reason for such criticism may be the lack of quantifiable assessment within those disciplines.

Another factor that has affected the autonomy of faculty in curriculum planning is the expansion of faculty workloads, particularly in the areas of advising and committee service, due to a number of factors including the increase in part-time faculty as well as the demand for assessment measures from stakeholders. Further complicating the ability of faculty to produce the sort of quantifiable assessments preferred by many of those stakeholders are the differing epistemological traditions of many disciplines, particularly those in the humanities (Nelson, 2011; Wang, 2011). While the participation of faculty will be required to accomplish any sort of meaningful curriculum improvement, effective administrative leadership, by department chairs in particular, is necessary to accomplish that task.

Educational leaders who are responsible for directing, or at least coordinating, faculty efforts to improve curriculum practices while providing institutional assessment also encounter widespread systemic practices that make curriculum planning and improvement extremely difficult (Sorcinelli, Austin, Eddy, & Beach, 2006; Stark, 2002). First, while faculty autonomy, including deference to the epistemological traditions within specific disciplines, has declined and remains under attack (Scott, 2012), it still provides the paradigm in which all curriculum

improvement projects will likely occur. Regardless of size, it is a common practice for colleges to organize themselves into departments according to discipline. Similar departments may then be grouped into instructional divisions or colleges under the directions of a dean, vice-president, or comparable administrator. The individual departments typically have a department chair, often serving in a fixed rotating term. These department chairs often see themselves as faculty members first and administrators second. Indeed, their administrative duties are often temporary, and the bulk of their professional career is spent as a faculty member. The deans and vice-presidents, on the other hand, while they may have begun as faculty members become increasingly administrative in their focus over the course of their careers (Foster, 2006; Hubbell, 2012; Palm, 2006). Much of the research associated with curriculum planning seems to focus on the role of either administrators or faculty without considering the dual administrative/faculty function of those who may be most directly involved in such processes, specifically department chairs. However, there is evidence that department chairs at teaching-oriented universities and community colleges are more likely to assume directive roles in initiating curriculum leadership than their university counterparts perhaps in part because faculty in those institutions tend to be generalists who teach subject matter familiar to all (Stark et al., 2002). Also, community college department chairs, especially those at smaller institutions, may be more likely to be heavily involved in institutional assessment and thus more apt to engage in directive leadership. Whatever the case, research examining methods through which department chairs can perform the dual administrative/faculty tasks required of them is limited.

Statement of the Problem

Despite the formal systems and regulations through which faculty control of curriculum decisions and assessment is assured, the necessity to respond to the demand for institutional

assessment requires that department chairs, especially at community colleges, view curriculum from an administrative perspective. Even so, department chairs are often reluctant to direct curriculum development for fear of infringing upon academic freedom of faculty as well as the hesitancy to involve themselves in disciplines in which they hold little expertise (Hubbell, 2012). This hesitancy is exacerbated by a lack of training in curriculum development (Sirkis, 2011). Also, the increased workloads of college faculty resulting from the rise in part-time faculty has resulted in an expansion of other duties assigned to full-time faculty such as advising and committee service (Kezar & Lester, 2009a). Increased workloads of full-time faculty, in turn, have produced a corresponding expansion in administrative responsibilities for department chairs. Organizationally speaking, by occupying the middle ground between administrators and faculty, department chairs are most directly responsible for quality issues within their departments, including curriculum assessment.

The problem, then, is to determine methods through which educational leaders, especially department chairs, can both meet the requirements of institutional assessment and also direct curriculum improvement without compromising the long held values of shared governance and academic freedom. A potential solution lies in integrating two theoretical models that could allow educational leaders to initiate and to lead curriculum development by enhancing instructional methods while minimizing the impact on course content. The first such model is curriculum potential theory. The second is working memory.

Purpose of the Study

The purpose of this study was to test an empirical model through which educational leaders can produce quantitative assessments of curriculum that will satisfy the requirements of institutional assessment to external stakeholders and provide meaningful data for curriculum

improvement to faculty. More specifically, the purpose was to determine the associations between writing relevant knowledge as indicated by performance on a writing terms exam and academic outcomes in composition sequences. If such associations can be convincingly established, they would indicate a possible model for producing acceptable measures of institutional assessment as well as producing data essential to improve curriculum content and practices.

Conceptual Framework

Because this study examines the dual administrative/faculty role of department chairs, it was necessary to consider multiple theoretical models. Two such models seemed particularly well-suited to properly frame this study: curriculum potential and working memory.

Briefly put, curriculum potential is a conceptual framework that suggests curriculum be viewed as a set of possible learning outcomes rather than a set of intended learning outcomes. The concept of curriculum potential seems to have been first proposed by Schwab (1973) and then further developed by Ben-Peretz (1975). More recently, Deng (2011) has suggested that curriculum potential has the capacity to contribute to curriculum planning research. Deng (2011) argues that current discourse regarding curriculum planning is so heavily weighted toward assessment and accountability (Karseth & Sivesind, 2010) that it may divert attention from the ongoing development of curriculum. For instance, the insistence on measurable outcomes could lead us to ignore other potential outcomes.

In a broad sense, curriculum consists of a specific subject or course of study. Curriculum materials would include such items as syllabi, textbooks, teaching guides or other materials actually used in instruction. A large body of research exists regarding how teachers interpret and deliver curriculum materials within the classroom, much of which considers how a teacher's own

personal characteristics and beliefs affect the curriculum. By focusing on the agency of the instructor rather than the actual curriculum, such research provides little information regarding the potential embedded in the curriculum materials. Deng (2011) and Doyle (1992) both argue that instructors are expected to interpret the curriculum materials used in terms of their own experience and content knowledge to the point that curriculum achieves independence from texts and other curriculum materials, in effect rendering them symbolic. In such a view, curriculum becomes what students receive in the classroom regardless of the intentions of curriculum designers, much less the content contained in the curriculum materials themselves. By making the teacher the focal point of curriculum research, the result is that not much is known about the achievement of curriculum potential. Deng (2011) identifies the need for "interpreting" curriculum materials for curriculum potential by "analyzing and unpacking the meaning and significance of content contained in the materials" (p. 539). To accomplish this task, Deng (2011) argues that curriculum content be evaluated through the German *Didaktik* tradition for educational potential, a tradition that provides a framework for analyzing curriculum potential within a classroom context but which is largely unknown in English speaking countries. In this tradition, Klafki (2000) includes a five-step set of questions for evaluating curriculum potential in terms of exemplary value, contemporary meaning, future meaning, content structure, and pedagogical representations. Examining exemplary value requires that instructors consider content in terms of basic phenomena or fundamental principles involved, while analysis of contemporary and future meaning require a consideration of the present knowledge and future application of curriculum by students. Questions focused on content structure and pedagogical representations should lead to improved instructor-student interactions. Deng (2011) expands upon this framework by advocating that curriculum potential be considered at the institutional,

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programmatic, and classroom levels. By directing faculty through the development and implementation of a terms exam based on foundational concepts and terminology within their disciplines, department chairs can collect quantifiable data associated with the exemplary, contemporary, and future meaning of curriculum materials and instruction. This data could be useful for both institutional assessment and improvement of content structure and pedagogical representation within curricula. Thus, a focus on curriculum potential could provide educational leaders a possible model with which to direct curriculum development and also learning assessment on their campuses.

Because this particular study focuses on composition courses, a second conceptual framework based in composition theory is necessary. Working memory, first proposed by Baddeley and Hitch (1974), provides a means to examine the efficacy with which one performs a task involving memory. As first proposed, the model consists of three components: a central executive which serves as an attentional controller supported by two subsidiary systems--a phonological loop in which verbal information is stored, and a visuospatial loop in which visual information is stored. Eventually, a fourth component was added to the model (Baddeley, 2000), the episodic buffer that provides a mechanism for the storage of integrated episodes that are multidimensional, i.e. involve both phonological and visuospatial information. Examining the associations between student ability to define writing relevant concepts and subsequent academic outcomes in composition courses will contribute to our understanding of the relationship between working memory and writing.

Examining curriculum potential within the *Didaktik* tradition requires a consideration of contemporary and future applications, and both contemporary and future applications of any curriculum that involves process make demands on working memory. If an association can be

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demonstrated between student knowledge of foundational concepts (writing relevant knowledge as demonstrated on terms exam) and other outcomes (academic outcomes in composition courses), that finding provides some measurement of both curriculum potential and working memory and may suggest potential applications in other disciplines in which quantifiable assessment is problematic, not to mention contribute to curriculum improvement as well. For instance, all disciplines presumably contain specific foundational concepts unique to them. A terms exam provides a relatively simple way to quantify student acquisition of those concepts.

Research Questions

The question is whether student knowledge of writing relevant concepts as demonstrated on a terms exam can be associated with academic outcomes within a composition sequence. Such a finding should be of considerable interest to educational leaders at most public colleges given that 90% of all state flagship universities include a composition requirement (American Council of Trustees and Alumni, 2009). At the small community college in eastern North Carolina where this study will take place, all students enrolled in ENG 111, the first semester curriculum level composition class, are required to demonstrate knowledge of specific writing concepts by defining those concepts in a written exam. This study will answer the following research questions using data collected in association with the ENG 111 Terms Exam and in composition courses.

- Question 1—What is the association between student scores on the ENG 111 Terms Exam and student semester grades?
- Question 2—What is the association between student scores on the ENG 111 Terms Exam and subsequent composition courses, i.e. ENG 112 or ENG 114?

- Question 3—What is the association between writing relevant knowledge, i.e. specific writing concepts and academic excellence in composition courses?

The answers to these questions will assess student acquisition and application of foundational knowledge inherent in accomplished writers, i.e. the achievement of curriculum potential. This type of quantifiable assessment in a subject (English composition) in which there is considerable skepticism that results can be quantified but one which is a core requirement in most college curriculums could provide educational leaders, especially those who have dual administrative/faculty responsibilities, with a potential model to lead faculty initiatives to improve curriculum while also satisfying the administrative necessity to provide quantifiable assessments to external stakeholders.

Significance of Study

Many educational leaders, specifically division chairs, hold dual administrative/faculty responsibilities. At community colleges in particular, division chairs are increasingly involved in quality issues related to institutional assessment which requires that they direct, or at least manage, the type of quantifiable assessment necessary to satisfy external stakeholders. One of the areas for which they are most directly responsible for institutional assessment is curriculum. Despite the necessity to respond to the demand for assessment, available research clearly indicates that educational leaders are reluctant to assume a formative role in curriculum planning for a number of reasons most notably the tradition, even requirement, of faculty autonomy in curriculum matters. Stark (2002) found that those activities that chairpersons reported doing most frequently included coordinating curriculum planning but not initiating, evaluating, or linking it with external constituencies. Among the activities that chairpersons reported doing least frequently were expanding their own or faculty expertise in curriculum planning and taking

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leadership roles in forums outside their institutions or even their own departments. Also, they reported that the activities they most infrequently performed were those for which they felt the least prepared (Stark, 2002). Ultimately, Stark (2002) found that "chairpersons currently receive little or no preparation or orientation for their roles" and "are unlikely to pursue professional development once they accept the job of curriculum leader" (p. 80). The study proposed in this dissertation could provide a means for educational leaders to satisfy the necessity for quantifiable institutional assessment while also producing data essential to curriculum improvement.

Also, the body of research that considers the dual administrative/faculty role of department chairs is small, especially at the community college level. Given both the importance and difficulty of responding to the demand for accountability and also of improving curriculum in disciplines in which quantifiable assessment is difficult, there is a clear need for studies that provide actionable models with a clear application. The study proposed in this dissertation could provide such a model and contribute to the literature associated with both working memory and curriculum potential.

Delimitations of the Study

This study was conducted from August 2011 to December 2012 at a small community college in eastern North Carolina. Study subjects included students enrolled in ENG 111 (Expository Writing) and subsequent composition courses ENG 112 (Argument-Based Research) and ENG 114 (Professional Research and Reporting). The data collected was drawn from embedded course assessments.

Definition of Terms

The following definitions have been synthesized from multiple sources by the author of this study. Principal influences are cited in the following definitions when appropriate.

Curriculum potential—A consideration of the meanings and significance of curriculum materials in a subject or course of study. Curriculum potential may be interpreted beyond the source of origin. The concept of curriculum potential was first proposed by Schwab (1973) and later amplified by Ben-Peretz (1975).

Curriculum planning process—Three step process through which curriculum is improved in a cyclical manner: development, implementation, and evaluation (Latucca & Stark, 1997, 2009).

Department chair—Educational leaders who serve dual administrative/faculty roles. At the community college level, the term department chair might be referred to by other titles including chair, head, coordinator, assistant dean, and dean (Craig, 2005).

Genre knowledge—Knowledge of specific rhetorical strategies routinely employed by experienced writers, e.g. narrative and argument (McCutcheon, 2011).

Long-term working memory (LTWM)—Provides an explanation for the reasoning and application that complicated cognitive tasks, such as writing, require (Ericsson & Kintsch, 1995).

Student learning outcomes—Empirical measurements of student performance. Outcomes assessment focuses on quantifiable evidence of what students know or can do.

Text production—The production of a written text through the application of two distinct skill sets: *text generation*, the mental production of a linguistic message; and *transcription*, the recording of that linguistic message in written form. Together, transcription and text generation are sometimes referred to as *fluent language generation processes* (Berrninger & Swanson, 1994).

Working memory—The system which holds multiple pieces of transitory information in the mind so that they are available for verbal and nonverbal tasks. A multicomponent theory of

working memory was first proposed by Baddeley and Hitch (1974). Baddeley's and Hitch's model includes a *central executive* that serves as an attentional controller supported by two subsidiary systems: a *phonological loop* in which verbal information is stored, and a *visuospatial loop* in which visual information is stored. Baddeley (2000) later added a fourth component, an *episodic buffer* that provides a mechanism for the storage of integrated episodes containing both verbal and visual information.

Writing process—The recursive process through which written composition is created. Hayes and Flower (1980) identified three major activities within the process: planning, translating, and reviewing.

Writing relevant knowledge—Multiple sources of knowledge stored in long-term memory that are essential to writing expertise. The term refers to both topic knowledge and genre knowledge (McCutcheon, 2011).

Limitations of the Study

The major limitation of this study is its focus on a single subject area. This may affect the generalizability of the study to other disciplines. However, this limitation is mitigated by the fact that subject area studied is a core requirement in most college curriculums.

Another limitation is the assessment method. Difference in instructor practices in assigning final grades could affect study results. Still, the use of grade assessments in subsequent courses should reduce the possibility of instructor bias.

Organization of the Study

The study is arranged in five chapters, a bibliography, and appendixes in the following manner. Chapter 2 presents a review of the related literature regarding roles played by administrators and/or faculty leaders in curriculum development, the influence of assessment

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concerns upon curriculum development, working memory theory, and curriculum potential theory. Chapter 3 delineates the research design and the methodology of the study. The instruments used to gather the data, the procedures followed, and details of the sample selected for the study are described. Chapter 4 presents an analysis of the data and a discussion of the findings. The summary, conclusions, and recommendations of the study are included in Chapter 5 as well as suggestions for potential future research. The study concludes with a bibliography and appendixes.

CHAPTER 2: REVIEW OF LITERATURE

Assessing curriculum in a systematic manner that both satisfies external demands for quantifiable assessment as well as provides meaningful data for curriculum improvement is a formidable challenge for leaders in higher education. To accomplish this task, institutions must find ways to balance the administrative need for accountability to external federal and state agencies as well as other accrediting groups against the more internal concerns of faculty whose views concerning the value and effectiveness of curriculum are often quite different. Latucca and Stark (2009) observe that leaders who hope to achieve curricular change must "use several models simultaneously and consider many factors" and that there is "a considerable body of evidence" regarding curricular and organizational change in higher education that demonstrates that plans that draw from several models "stand the best chance of success" (p. 319). This dissertation combines two conceptual frameworks, curriculum potential and working memory, to determine if a relationship exists between the writing relevant knowledge of students as measured by performance on a terms exam and their academic outcome in first year composition sequences. Such composition sequences represent a nearly universal general education requirement in college curriculums, and methods for improving student outcomes in those courses should be of significant interest to educational administrators and faculty who lead curriculum planning projects. The focus on curriculum potential could also help alleviate the general reluctance of administrators to actively engage in curriculum planning for fear of infringing upon faculty authority to determine curriculum by providing a model by which to direct the development of quantifiable assessments while ensuring a high degree of faculty autonomy. This section reviews current, relevant literature and is organized as follows: (1) characteristics of curriculum planning; (2) leadership roles in curriculum planning; (3)

curriculum planning within disciplines; (4) curriculum potential theory and; (5) working

memory theory.

Characteristics of Curriculum Planning

Administrative hesitance to intrude into curricular areas is well founded. The 1966

Statement on Government of Colleges and Universities jointly formulated by the American

Association of University Professors (AAUP), the American Council on Education (ACE), and

the Association of Governing Boards of Universities and Colleges (AGB), states that curriculum

is the "responsibility primarily of the faculty." While one might conceivably parse the meaning

of primarily, in practice administrators have tended to leave curriculum matters to faculty.

One of the results of the trend toward lessening autonomy was the rise in demand for

accountability and assessment that gained force in the mid-80s and has continued ever since

(Ewell, 2009). Altbach (2011a) even goes so far as to suggest academia is shifting from

autonomy to accountability and that the "golden age of the American university is probably

over," (p. 247). In any event, Eckel and Kezar (2011) note that educational leaders must address

this demand for accountability, largely by external stakeholders, against a set of internal

organizational dynamics unique to colleges: dual sources of authority, loose coupling, and

garbage-can decision making. Curriculum planning and change is most directly affected by the

first of these, dual sources of authority. Authority in traditional hierarchical institutions tends to

correlate to administrative position whereas higher education tends to be defined by two sources

of authority, bureaucratic (administrative), and professional (academic) (Eckel & Kezar, 2011).

In terms of practice, faculty have priority over curriculum and administrators are responsible for

administrative decisions. Eckel and Kezar (2011) suggest that the result is that authority is not so

much shared as "dispersed" and that faculty often have a "competing source of influence" with

administrators (p. 287). Altbach (2011b) predicts that criticism of this traditional form of academic governance will lead to an "administrative estate" in which administration of higher education becomes an increasingly specialized profession (p. 28). The point is that educational leaders responsible for curriculum planning and change must find ways to synthesize the administrative and academic sources of authority in order to be successful.

That the trend is toward an increasingly executive model of leadership in higher education cannot be doubted (Altbach, 2011b; Scott, 2002). Cohen (1998) and others have observed that a more highly professionalized faculty is not likely in the future, in part due to the increased reliance on part-time faculty and staff in order to reduce costs. Such a reduction obviously produces several results. One, it may produce a tiered faculty in which full-time, particularly tenured, faculty are most likely to assert their opinions in curriculum matters. Admittedly, senior and tenured faculty are presumably the faculty best qualified to direct curricular matters. However, a reduction in full-time positions increases the workloads of the remaining ones, particularly in service areas (Kezar & Lester, 2009b). Increased duties may include managing part-time faculty, increased advisor loads, and more program and departmental service work. Other factors include an increase in publication standards that have tripled since 1970, at least at research institutions (Schuster & Finkelstein, 2006). Additionally, new technologies may require faculty to continually retool their teaching methods much more than has been the case in the past. The point is that as faculty workloads have increased, they have become less engaged in campus governance (Kezar & Lester, 2009b).

Leadership Roles in Curriculum Planning

Given the complexity of balancing administrative and faculty roles, how does one lead

effective curriculum planning? Stark and Latucca (1997) suggested Quinn's "competing values

model" as a useful framework to examine curriculum leadership and administration within

academic departments. They explained that the competing values model was chosen because it

not only includes an internal-external focus which parallels internal and external influences on

curriculum but also a flexibility-control dimension that considers the faculty need for autonomy

in curriculum planning as well as the administrative need for coordination in order to maximize

accountability to external stakeholders (Stark & Latucca, 1997). Based on these two dimensions,

Quinn's model produces four quadrants: a flexible/internal focus (human relations—mentoring,

facilitating); a control/internal focus (internal process—monitoring, coordinating); a

control/external focus (rational goal model—producing, directing); and a flexible/external focus

(open systems—innovating, brokering).

In subsequent research Stark (2002) examined whether this interpretation of Quinn's

model "represents recognizable leadership roles in academic departments" (p. 62). In this study,

Stark used a two-stage sampling process that sought first to identify the sort of dynamic

collective cultures that Hecht, Higgerson, Gmelch, and Tucker (1999) had indicated were the

exception and not the rule. Once these "exceptional" academic departments were identified

through nomination by chief academic officers based on several criteria, Stark then conducted a

survey of curriculum leadership activities as reported by department chairpersons. The

institutions surveyed included 207 4-year and 225 2-year colleges. Ultimately, 429 departments

drawn from 137 institutions were judged to have met the criteria, 316 of whose chairpersons

(76.5%) elected to participate in a 50 question survey designed to identify into which of the four

leadership styles defined in the Quinn model they fit (Respondents were not given the descriptors). Stark (2002) found that those activities that chairpersons reported doing most frequently included coordinating curriculum planning but not initiating, evaluating, or linking it with external constituencies. Among the activities that chairpersons reported doing least frequently were expanding their own or faculty expertise in curriculum planning and taking leadership roles in forums outside their institutions or even their own departments. Usually, they reported that the activities they most infrequently performed were those for which they felt the least prepared (Stark, 2002). Ultimately, Stark (2002) found that "chairpersons currently receive little or no preparation or orientation for their roles" and "are unlikely to pursue professional development once they accept the job of curriculum leader" (p. 80).

Stark and Latucca (1997) identified three steps in a cyclical curriculum planning process: development, implementation, and evaluation. Stark, Briggs, and Rowland-Poplawski (2002) identified seven "leadership" themes to characterize the roles department chairpersons play in curriculum development:

- Sensor—problem sensor, external/internal sensor, information broker, and vision setter;
- Facilitator—may set tone or schedule meeting but never presents proposals, emphasis on process;
- Initiator—may introduce proposals, ideas, or drafts of changes, sets meetings, often a sensor as well;
- Agenda setter—somewhere between facilitator's focus on process and initiator's development of proposals or ideas, brings issues to the table rather than proposals;

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- Coordinator—provides structure, task orientation, and paperwork to support faculty involved in curriculum development;

Advocate—concentrates on securing resources to support faculty for individual projects and department-wide curriculum decisions; and Standard setter—responsible as either role model or monitor of quality or both.

In a study involving 50 departments identified as "continuously planning departments" through a two –stage sampling process, the authors included 44 interviews of department chairpersons and 83 additional interviews of faculty members to analyze leadership activities involved in curriculum development (Stark et al., 2002). At the stage of *curriculum development*, the role of sensor was viewed by most chairpersons as key to curriculum development. However, when it came to translating issues identified through sensing into actual curriculum proposals, the chairperson tended to play no role at all or acted as facilitator, agenda setter, or initiator. The role of agenda setter or initiator was more closely linked to external sensing than that of facilitator. Even so, most chairpersons "try to either play, or be perceived as playing, the facilitator role so that curriculum development will be seen as a grassroots effort by faculty" (Stark et al., 2002, p. 347), and are thus reluctant to act as sensors.

In the next stage of the process, *curriculum implementation*, the roles of advocate and coordinator were most prominent. Stark et al. (2002) states that most studies of department chairpersons indicate that these managerial roles are routine tasks that can lessen involvement in other leadership activities.

The final general process, *curriculum evaluation,* involved the role of standard setter. Stark et al. (2002) found that nearly all of the chairpersons interviewed believed their departments should be doing more evaluation and predicted they would soon be expected to do

so. However, they also admitted that they lacked expertise in curriculum evaluation and provided little leadership in this area.

The study also found that the size of the department affects the leadership role played by the department chairperson (Stark et al., 2002). In large departments, chairpersons were more likely to assume the role of agenda setter or facilitator rather than act as initiator or sensor. Institutional type also affected leadership roles. In research and doctoral institutions, chairpersons see their primary roles as advocate or facilitator. In teaching-oriented universities and community colleges, chairpersons were more likely to perform as sensors or initiators, perhaps because faculty at those institutions are more often "generalists" in their fields. Also, standard setting at those institutions was more likely to involve mentoring and role modeling. However, all types of institutions stressed the role of advocacy (Stark et al., 2002). Still, because this particular study was conducted at a small community college, the model it employs may prove most effective at similar institutions.

Other findings included the observation that curriculum leadership is affected by the institutional climate in regard to strategic planning. Community colleges were especially likely to create "an ethos of monitoring and improvement" in which department chairpersons saw themselves as "members of an administrative 'quality team' that implied their clear responsibility to lead curriculum planning" (Stark et al., 2002, p. 351). This last finding is particularly interesting, suggesting as it does that department chairpersons at community colleges may view themselves as more fully administrators than chairpersons at larger institutions who tend to identify themselves primarily as faculty members. That difference could suggest contrasting views of faculty autonomy and shared governance and might prove a fruitful area for

additional research. In any event, this dissertation should be of particular interest to community college leaders engaged in curriculum planning.

The available research involving the leadership role of departmental chairpersons in curriculum development suggests several considerations. For example, the models provided by Latucca and Stark (2009) and others provide a useful framework for both departmental chairpersons and institutions as a whole to examine their own curriculum processes to identify the types of leadership roles most likely to foster successful curriculum development on their campuses. Also, the epistemological traditions of diverse disciplines ensures that common methods of curriculum development, while perhaps possible, will not be achieved without considerable conflict if not anguish. This conflict will no doubt be exacerbated by frustrations associated with the decline in faculty autonomy currently taking place across the landscape of higher education.

One potential strategy for alleviating such concerns is the distributed leadership model which is characterized by the distribution of tasks and of influence processes, i.e. processes that change how others think or act (Robinson, 2008). Robinson (2008) argues that distributed leadership could be effective in improving both teaching and learning. However, she observes that of the "thousands of published studies of educational leadership" that fewer than 30 have "empirically tested the relationship between leadership and student academic…outcomes," adding that even fewer have involved distributed leadership (Robinson, 2008, p. 241). While the study that is the focus of this dissertation does not directly involve distributed leadership, the methods employed do require a key feature of distributed leadership, i.e. the interaction of leaders, teachers, and the situation (Spillane & Diamond, 2007) to influence curriculum. Also, in advocating the potential of distributed leadership to understand the internal dynamics of

leadership practice, Spillane, Halverson, and Diamond (2004) observe that while much is known about what structures are required for instructional change, little is known about how leaders are to accomplish such change. This study will add to that body of knowledge.

Curriculum Planning Within Disciplines

Although the trend toward less shared governance is likely to continue for the foreseeable future, one of the consequences (perhaps ironically) will be that increased collaboration will become essential to curriculum planning if assessment models that will satisfy the demands of external stakeholders are to be developed. For over a century, one of the organizing principles of the academy has been increasing fragmentation and specialization (Kezar & Lester, 2009a). As new disciplines have developed, research and teaching have become increasing specialized to the point that faculty have been described as academic tribes (Becher, 1989). Arnold (2004) even goes so far as to state that the professoriate are "a fragmented group of specialists" who "have difficulty seeing things from the perspectives of others in their own disciplines, let alone across disciplinary lines" (p. 591). Kezar and Lester (2009a) argue that the result of such specialization has been an "impoverished" undergraduate education, the improvement of which is stifled by departmental structures that hinder collaboration. Former President of Stanford Donald Kennedy (1997) stressed that reorganizing higher education institutions to increase collaboration is a primary challenge that has the potential to ensure future academic excellence. That Kezar and Lester (2009a) continue to characterize higher education as "siloed, bureaucratic, and hierarchical organization" (p. 22) suggests that higher education is yet to meet that challenge. Because the methods employed in this study require extensive collaboration between administrators and faculty, the findings will help to identify potential means for additional collaboration.

Faculty training and socialization also may prevent effective collaboration in curriculum planning, especially in the disciplines within the humanities and social sciences (Kezar & Lester, 2009a). Research in those fields tends to be conducted in isolation, and graduate students are encouraged to emphasize individual contribution in order to achieve tenure (Kezar & Lester, 2009a). As a result, persons in these fields may become habituated to working alone and thus less likely to seek or perhaps even value collaboration. Latucca and Stark (1994, 2009) found that faculty in these fields tended to encounter difficulty in determining curriculum coherence including specific sequences of learning content. Contrastingly, they found that the quantifiable nature of the subjects studied in the disciplines such as the natural and physical sciences contributed to highly developed modes of inquiry as well as general consensus on validation criteria. For instance, there is less consensus about what constitutes an authentic claim or curriculum coherence in the humanities and asocial sciences than in the natural and physical sciences. Not surprisingly, research within the physical and natural sciences is characterized by frequent collaboration.

Donald (2002) examined the type and number of concepts found in typical courses, finding that courses in disciplines such as the natural or physical sciences are characterized by specific, concrete concepts whereas concepts in the humanities and social sciences tend to be much more abstract. Additionally, she found that the relationships between concepts in mathematics and the physical sciences tend to be hierarchical with one concept building upon another in a linear fashion. However, in the social sciences, relationships between concepts tended to be based on clusters of ideas in which one concept might serve as a pivot point depending on the preference of the instructor. Concepts in humanities courses were linked even more loosely than in the social sciences if at all (Latucca & Stark, 2009). In demonstrating that a

quantifiable, foundational body of writing relevant concepts may be predictive of future success in writing courses, this study could provide curriculums in the humanities and social sciences with a means to satisfy the hierarchical nature of demands for assessment without contradicting the more iterative, recursive nature of those disciplines.

Stark (2002) reports that relative to other areas such as personnel management and legal issues, curriculum development has received little attention in research focusing on department chairpersons. She explains that numerous surveys conducted between 1953-1997 indicate that department chairpersons spend little of their time leading curriculum planning (Stark & Briggs, 1998). This finding reinforces the perception of autonomy that faculty have historically enjoyed in curricular matters as well as perhaps suggests that curriculum planning and improvement had not yet emerged as a point of emphasis during the period studied. Either way, it does suggest that department chairpersons now find themselves performing leadership roles that were previously left to others if performed at all. Further, there often exist no grassroots efforts by faculty to assume leadership roles unless they also plan to pursue administrative careers in the institutional hierarchy (Wergin, 2007). Sorcinelli et al. (2006) found in a survey of faculty development centers that none of the center directors indicated faculty leadership development as a goal, instead focusing primarily on teaching issues. Much of the literature suggests that "we know very little about ways to foster faculty leadership, particularly grassroots efforts" (Kezar & Lester, 2009b, p. 732). Kezar and Lester attribute this lack of knowledge to the decline in shared governance and suggest that the remedy to the problem is a return to strong shared governance models, a reduction in part-time and non-tenured faculty, and a revision of workloads, all of which are unlikely to occur.

The research indicates a clear need for specialized training in curriculum development, implementation, and development for those charged with leading such efforts at community colleges, specifically department chairs (Sirkis, J. E., 2011). Research suggests that 80% of all key decisions in academic settings are made at the department level (Carroll & Wolverton, 2004; Hecht, Higgerson, Gmelch, & Tucker, 1999). However, as Stark suggests, in most instances the department chairperson is expected to act as "both change agent and manager, both preserver of program quality and initiator of discussions about improvement" (Stark, 2002, p. 80). To effectively achieve such competing goals, leadership training beyond knowledge of one's discipline would seem to be in order yet is rarely provided. Still, both faculty and administrators engaged in curriculum planning and assessment should acknowledge the fact that both expectations and roles are changing.

Curriculum Potential

The challenge, then, is to find a theoretical framework that allows educational leaders to assume directive, formative roles in curriculum planning while appeasing faculty fears of infringement upon their traditional power to determine curriculum. Curriculum potential provides such a framework. One again, curriculum potential is a conceptual framework that suggests curriculum be viewed as a set of possible learning outcomes rather than a set of intended learning outcomes. The term curriculum potential seems to have been introduced by Schwab (1973) in "The Practical 3," the third in his seminal series of four papers published in 1969, 1971, 1973, and 1983, decrying the inadequacy of purely theoretical approaches to curriculum making. In Schwab's (1973) model, the task of translating scholarly materials into curriculum should include persons with expertise reflecting "five bodies of experience" (p. 502): subject matter, learners, milieus (communities in which learning would occur and be used),

teachers, and curriculum making (the actual process of curriculum making). The first four of these are considered "commonplaces of equal rank" (Schwab, 1973, p. 508), whose interests must be coordinate with rather than subordinate to the role of the scholar-specialist representing the fifth group. Schwab does point out that the size of the each of these "bodies of experience" is not necessarily determined by the number of representatives in each group but rather that the group should reflect the interests of each body of experience equally. Schwab (1973) suggested that curriculum potential represented a consideration of two attitudes toward scholarly materials to be translated into curriculum--first that they be viewed as resources, and second that scholarly materials possess three "faces," i.e. that curriculum is "three different things" (p. 515). The first of the three faces is the purport, that which the materials convey, e.g. a body of scientific material explains phenomena and that explanation constitutes one of its faces. The second face is that which produced it. In other words, scholarly materials represent an outcome of an originating discipline. And the third face includes access disciplines that are necessary to reveal those scholarly materials as a "compound object" in their full complexity (Schwab, 1973, p. 515). It is only through examining scholarly materials through these three faces that disciplinary content can be conceptualized for curriculum potential.

The concept of curriculum potential was further amplified and defined by Ben-Peretz (1975, 1990). In essence, Ben-Peretz (1975) argued that once removed from the hands of its developers that curriculum could be seen as "the embodiment of a potential, independent of its developers' intentions" (p. 151). Ben-Peretz, Katz, and Silberstein (1982) present curriculum on a continuum moving from "formal" to "operational." In this model, teachers would intervene with curriculum following the formal stage which represents curriculum as envisioned by its developers, thus reaching a stage characterized by the curriculum "as perceived by teachers"

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before moving though a second intervention point to the operational curriculum which is marked by what is actually taught in the classroom. In this and subsequent research, Ben-Peretz focused on what she termed the second level of curriculum interpretation, i.e. as performed by the teacher rather than the first level of curriculum interpretation which includes the transformation of scholarly content into curriculum materials by curriculum writers (Ben-Peretz, 1990; Ben-Peretz, Katz, & Silberstein, 1982). Deng (2011) argues that researchers have tended to ignore this first level of interpretation, and this study will help to address that deficiency.

In "Revisiting curriculum potential," Deng (2011) cites a large body of literature to support his contention that curriculum research over the past two decades has focused on the agency of teachers rather than examining what is contained in curriculum materials. For example, this focus on the teacher can be seen in Shulman's model of pedagogical reasoning that considers curriculum as presented by teachers as a product of their content knowledge, pedagogical content knowledge, and curricular knowledge (Shulman, 1987). By focusing on teacher knowledge of content rather than the content itself, the result is that the teacher interprets curriculum for students to the point that curriculum achieves an "independent existence" separate from "texts and materials" (Doyle, 1992, p. 499). Deng (2011) suggests that such an approach reduces curriculum materials to symbolic meanings as interpreted by teachers. He further argues that curriculum materials should be interpreted for curriculum potential by "analyzing and unpacking the meaning and significance of content contained" (Deng, 2011, p. 539) in them. Such an analysis, according to Deng (2011), must take account of a theory of content, i.e. the particular selection, arrangement, and framing of content for educational and pedagogical purposes.

Deng (2011) argues that the German *Didaktik* tradition is particularly well suited to analyze curriculum materials for curriculum potential. Unlike in American higher education, the *Didaktik* tradition is based on a centralized, state-based curriculum although instructors do have a high level of autonomy (according to Deng) to interpret that curriculum. As described by Deng (2011) and Klafki (2000), in the *Didaktik* theory of curriculum and content, didactic analysis of curriculum potential is performed by answering questions from five perspectives of curriculum: exemplary value, contemporary meaning, future meaning, content structure, and pedagogical representations. Building upon this idea, Deng expands the concept of curriculum potential to consider three levels of curriculum context: the institutional, the programmatic, and the classroom. At the institutional level, curriculum represents an abstract or ideal curriculum that connects the institution to society (Doyle, 1992a, 1992b). The programmatic level translates that ideal into actual curriculum structures, and the classroom curriculum refers to what actually occurs between students and instructors within the classroom (Doyle, 1992a, 1992b). By demonstrating that student knowledge of specific writing concepts can be associated with academic outcomes in composition sequences, department chairs can provide quantifiable assessments at the programmatic level that can be used to validate the institutional connection to society, i.e. external stakeholders.

Working Memory

Because this study examines specific elements of composition sequences, some examination of composition theory is necessary. The model of working memory first proposed by Baddeley and Hitch (1974) provides a means to examine the efficacy with which one performs a task involving memory. As first proposed (1974), the model consists of three components: a central executive which serves as an attentional controller supported by two

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subsidiary systems--a phonological loop in which verbal information is stored, and a visuospatial loop in which visual information is stored. Eventually, a fourth component was added to the model (Baddeley, 2000), the episodic buffer that provides a mechanism for the storage of integrated episodes that are multidimensional, i.e. involve both phonological and visuospatial information.

There exists a considerable amount of research examining the relationship between working memory and writing. Much of it focuses on the role each component of Baddeley's model plays in individual steps of the writing process. The three major activities (Hayes & Flower, 1980) of the writing process—planning, translating, and reviewing—all place demands on various components of working memory. (Note: There are other respected composition theories that define the writing process in a different manner than Hayes and Flower. However, as applied in this study, any differences are largely semantic in that working memory addresses the role of memory in all processes.) Because three of the four mechanisms in the working memory model involve storage of information, capacity is an issue. General capacity theories suggest that the limited storage available in working memory at some point will affect a writer's ability to perform the processing tasks necessary to produce new text. For instance, the writing processes of skilled writers are largely viewed as interactive and recursive as demonstrated by the fact that the translating processes of skilled writers are often interrupted by editing (reviewing) and planning. However, many studies of composition (Bereiter & Scardamalia, 1987; Flower, 1979; McCutchen, 1988) indicate that the writing processes of unskilled writers tend to be noninteractive and encapsulated. In such a case, the difficulty of language retrieval from memory could preclude the writer from considerations of elements such as tone or audience while composing a sentence. Kellogg and Raulerson (2007) suggest that deliberate practice has

proven quite effective in training performance on related tasks. For instance, the better one types, the less cognitive attention one must devote to typing while composing text, and the efficiency with which one produces text improves.

Research by Kellogg (2001) suggests that the three activities associated with text production—planning, translating, and reviewing—each make demands on working memory resources such as the central executive. Generally speaking, if such demands are lessened, the "spare" capacity that results is redistributed equally among the three activities. For instance, through exposure to stories writers tend to acquire a sense of narrative structure at a relatively young age which is then applied in both listening to and telling stories (Howard, 1991; Mancuso, 1986). Perhaps not surprisingly, college composition curriculums tend to include narrative assignments early in their sequence (Engelhard, Gordon, & Gabrielson, 1991). However, beginning writers tend to hold less developed schemas for other rhetorical strategies such as argument and persuasion (Britton, Burgess, Martin, McLeod, & Rosen, 1975). In a study involving the production of narrative, persuasive, or descriptive texts randomly assigned among 48 college students, Kellogg (2001) found that the average length of the persuasive texts produced was significantly shorter than the average for the other forms, suggesting that persuasive texts required more planning and thus subjects were less able to devote memory resources to translating and reviewing. Further evidence in proof of this assumption was provided by an analysis of cohesion within the texts that assessed, among other things, the lexical, inferential, relational, conjunctive, and syntactic cohesion between independent clauses. The cohesion of the descriptive and narrative texts was found to be significantly higher than that of the argumentative texts (Kellogg, 2001). Other researchers (Olive, Favart, Beaujolais, & Beaujolais, 2009) reached similar findings, demonstrating that the cognitive demands of writing

argumentative texts place higher demands on young writers than does the writing of narratives. Also, Fitzgerald and Teasley (1986) demonstrated that the quality of stories written by children improved after they received instruction in narrative structure, suggesting a causal relationship between genre knowledge and writing outcome. Although much of the available literature involves research using young writers including children, one can infer that the attainment of such foundational knowledge is an essential stage in the development of writers of all ages. By demonstrating that student proficiency in genre and other writing relevant knowledge is linked to learning outcomes, this dissertation may provide a quantifiable assessment of the achievement of curriculum potential.

Since the seminal work published by Hayes and Flower (1980) which provided a cognitive model of the writing process, Hayes (1996, 2006) has expanded the three activity model of planning, translating, and reviewing. The concept of working memory was added (Hayes, 1996), and the process originally described as "reviewing" was broadened (Hayes, 2006) to include text production. McCutchen (2011) has conducted research focusing on the linguistic processes that support text production. In McCutcheon's theoretical frame, as linguistic skills and knowledge relevant to writing increase, the limitations of the writer's short-term working memory are offset by increasing access to long-term working memory. Earlier, McCutcheon (1984) had compared the ratio of words between writer protocol and text produced. The comparison involved interrupting writers in the process of writing and asking them to discuss the text produced to that point. The study revealed that the ratio of words in the writer protocol to text was much higher for experienced writers than novice ones suggesting that experienced writers put much more thought into the words that ultimately appeared on the page and indicating an awareness of multiple strategies typical of a recursive writing process. Novice

writers, on the other hand, tended to have a much lower ratio of words in the writer protocol to text. Bereiter and Scardamaila (1987) argued that novices attempt to find strategies that simplify the complex task of writing in contrast to experienced writers whose textual strategies reflect an awareness of multiple elements associated with effective writing. Further, the written text produced by the novice writers tended to reflect the writer protocol essentially word for word, suggesting that for novice writers the writing process does not include an awareness of writing strategy (McCutcheon, 2011).

In addition to genre knowledge, topic knowledge has also been linked to improved writing outcomes. Research has demonstrated that writers generate more content during planning processes when dealing with familiar topics compared to unfamiliar ones (Bereiter & Scardamalia, 1987). McCutcheon (1986) indicated a relationship between the coherence of a text and a writer's knowledge of the topic.

Berninger and Swanson (1994) emphasized two skills involved in text production: transcription and text generation. Much research has established that transcription processes, including hand writing and keyboarding skills, make demands on working memory that decrease as proficiency improves. Fortunately, transcription proficiency does tend to improve as writers move from childhood to adulthood (Berninger & Graham, 1998; Berninger & Swanson, 1994). Several studies (Hoskyn & Swanson, 2003; Jeffrey & Underwood, 1996; McCutchen, Covill, Hoyne, & Mildes, 1994) have also linked text generation to working memory. Berninger and Swanson (1994) characterize text generation as the mental production of a linguistic message as distinguished from transcription which involves the recording of that message in written form. As the amount of working memory devoted to the transcription processes is decreased, resource allocation to other processes is presumably increased, including text generation.

McCutcheon (2011) suggests that a current theory of writing development is based on the idea that writing expertise depends on two things: fluent language generation processes (transcription and text generation), and knowledge relevant to writing (topic knowledge and genre knowledge). She explains that this theory includes "an explanation of how multiple sources of knowledge, stored in long-term memory, are coordinated and used, all with the limits of a constrained working memory" (McCutcheon, 2011, p. 61). Ericsson and Kitsch (1995) expanded the concept of working memory to include long term working memory (LTWM) to provide an explanation for the reasoning and application that complicated cognitive tasks demand. According to Ericsson and Kintsch, LTWM includes the elements of working memory as traditionally defined which they designated as short term working memory (STWM), i.e. working memory as defined by Baddely (1986). However, LTWM also includes retrieval mechanisms that link items within STWM to related elements within LTWM.

Short term working memory is marked by capacity limitations. However, Kitsch (1998) argued that LTWM is limited only by the processes that build retrieval structures and by the extent of knowledge stored in long-term memory. Kitsch explained that as knowledge is practiced that it becomes "stable" and "automated" and "can be employed for encoding without additional resource demands" (Kitsch, 1998, p. 242). Thus, in the context of writing, LTWM resources help facilitate the production of text by skilled writers through access to previously written text stored in episodic text memory as well as through access to relevant knowledge including vocabulary and stored knowledge of genre structures and other rhetorical devices. Conversely, the working memory capacity of novice writers limits their effectiveness due to their lack of fluency in text production and meager writing-relevant knowledge (McCutcheon, 2011).

Summary

While there are varying degrees of literature involving curriculum planning, curriculum potential theory, and working memory theory, there is no body of literature that examines all three in conjunction with one another. Latucca and Stark (2009) have demonstrated the need for educational leaders to apply multiple models concurrently in order to achieve curricular change. Wraga (2002) provides the added stipulation that "curriculum practice should inform curriculum theory," (p. 17). Given the wide variety of curriculum models and practices as well as the complicating factors of disciplinary differences and traditions of autonomy and academic freedom, the literature indicates that educational leaders are reluctant to engage in formative curriculum planning.

Additionally, curriculum leaders must also consider the demand for quantifiable assessment of learning outcomes by external stakeholders including accrediting agencies. Demands for assessment are of particular concern to curriculum leaders responsible for the supervision of general education core courses including English composition. The literature indicates that quantifiable assessment within disciplines such as the humanities and social sciences is particularly difficult.

Research such as this study will not only add to the body of literature related to both curriculum potential theory and working memory theory, it will also provide a practical model for both curriculum improvement and quantifiable assessment. Other research suggests that the findings of this study may be of special interest to community college leaders because they tend to be more accepting of dual roles as administrators and faculty leaders, particularly when involved in curriculum planning.

CHAPTER 3: RESEARCH METHODOLOGY

The purpose of this research was to determine the degree of association between student ability to define terminology associated with writing relevant knowledge and academic excellence in a two semester sequence in English composition courses. The research methodology used in this study was quantitative in design. The description of the methodology used is organized as follows: problem statement, research questions, stages of methodology, study population, research design, data collection, exam instrument, and summary.

Problem Statement

College administrators and faculty are under increasing pressure to provide quantifiable assessments of student learning, a situation that is exacerbated in disciplines within the humanities and social sciences. Additional complications include the reluctance of educational leaders to engage actively in curriculum design and improvement for fear of infringing upon the long honored tradition of faculty control in curriculum matters based on the principle of academic freedom. Such reluctance is typical not only of educational leaders whose duties are primarily administrative but also faculty administrators whose administrative duties go beyond their own disciplines as is common in a community college setting. This study applied principles inherent in working memory theory (Baddely & Hitch, 1974) within a conceptual framework of curriculum potential theory (Schwab, 1973) to develop a curriculum improvement model capable of satisfying the demand for quantifiable assessment while limiting the impact on faculty control of curriculum.

Research Questions

This research answered the following questions:

- Question 1—What is the association between student scores on the ENG 111 Terms Exam and student semester grades?

- Question 2—What is the association between student scores on the ENG 111 Terms Exam and subsequent composition courses, i.e. ENG 112 or ENG 114?

- Question 3—What is the association between writing relevant knowledge, i.e. specific writing concepts and academic excellence in composition courses?

Stage One

Stage one of the methodology focused upon the ENG 111 Terms Exam and assorted associations involved with variables related to the exam. Stage one included analysis of the distribution of scores on the exam as well as analysis of individual items on the exam. The exam consisted of 23 items worth 5 points (see Appendix A). Exams were evaluated in single blind fashion with each item receiving a score of 0, 3, or 5 points. The dependent variable was the test score. Independent variables to be considered included demographic characteristics and course factors. Covariate factors considered included demographic characteristics such as race, age, gender, and instructor. The data set included all ENG 111 students who completed the ENG Terms Exam and who also received a semester grade in ENG 11 during fall 2011 or spring 2012. A combination of summary statistics and visuals facilitated univariate and bivariate analysis.

In examining individual items, visuals and tabular statistics were most important. However, the study also considered some very simplified response testing applying item response theory (IRT). IRT modeling can be especially useful in elucidating the potential difficulty of questions on an instrument of interest (Reckase, 2009). Item response theory attempts to provide mathematical representations of the locations of persons within a hypothetical multidimensional cognitive space. More specifically, IRT attempts to order persons

along a continuum of skill or knowledge, in this case as represented by performance on the ENG 111 Terms Exam. The continua that can be defined from item response data are dependent upon the characteristics of the sample of test takers and also the characteristics of test items. The mathematical functions developed to apply item response theory are based on several assumptions: that the location of persons taking the test remain constant, that characteristics of test items remain constant, that a response to an individual test items is independent of responses to other items, that the relationship between locations in the multidimensional space and the probabilities of a correct item response can be represented by a mathematical function, and that the probability of a correct response to a test item increases or does not decrease as the locations of persons taking the test increase within the multidimensional cognitive space (Reckase, 2009). One of the simplest of these models is Rasch modeling which is based on the premise that the interactions of a person with test items can be represented by a mathematical expression containing a single parameter to describe the characteristics of the person (Reckase, 2009). In Rasch modeling, all questions are considered either correct or incorrect.

In this example, IRT is being used to illustrate (or compare) item difficulty on the ENG 111 Terms Exam by comparing performance on individual items across all test takers. Because partial credit scores were possible in the ENG 111 Terms Exam, item responses were evaluated using a partial credit scale in which items receiving either 3 or 5 points were designated as correct and items receiving 0 points were designated as incorrect and also a full credit scale in which only those items receiving 5 points were designated as correct with those receiving either 0 or 3 points considered incorrect. Those questions that were answered incorrectly by individuals who answered many questions correctly were deemed "more difficult."

Stage Two

Stage two of the methodology examined the association between student performance on the ENG 111 Terms Exam and final grade received in ENG 111. A *t* test analysis and box plot graph was used to determine the association, if any, between test performance and final grades. Fisher's exact test was conducted using individual test items to determine which concepts were most strongly associated with test performance and/or quality points from completed courses. Mean scores and standard deviations regarding the ENG 111 Terms Exam for students who received an A in ENG 111 were calculated to determine a threshold that could be associated with academic excellence.

Stage Three

Stage three of the methodology involved the analysis of the associations between student performance on the ENG 111 Terms Exam and semester grades in subsequent composition courses, either ENG 112 or ENG 114. The data set analyzed in stage three included ENG 111 Terms Exam scores of all students who received a semester grade for ENG 111 in fall 2011 or spring 2012 and semester grades for all students who completed ENG 112 or ENG 114 during spring 2012 or fall 2012. Fisher's exact test was performed to determine the association, if any, between performance on the ENG 111 Terms Exam and grade in ENG 111. Fisher's exact test was also performed to determine the association between performance on the ENG 111 Terms Exam and grade in the subsequent course in the required composition sequence, either ENG 112 or ENG 114.

Stage Four

Stage four of the methodology synthesized the various associations identified in the first three stages. Statistical analysis was performed, adjusting by covariates to determine which

temporal factors could be most strongly associated with student performance on the ENG 111

Terms Exam, a semester grade of A in ENG 111, and a semester grade of A in either ENG 112

or ENG 114. Fisher's exact test was performed to identify any statistical significance in these

associations. Stage four also examined the association between instructor and student score on

the ENG 111 Terms Exam including Fisher's exact test to determine any statistical significance.

Also, analysis was conducted to identify associations, if any, between student knowledge of

individual exam items and a threshold score on the ENG 111 Terms Exam

Population

The participants of this study included all students who completed both ENG 111 and

ENG 112 or ENG 114 at a small community college in eastern North Carolina during fall 2011,

spring 2012, and fall 2012.

Research Design

The methodology used for this study was quantitative in design. The design was

structured to determine whether student ability to define specific writing relevant concepts was

associated with academic performance in a two course composition sequence. Whether academic

excellence in composition courses was associated with student ability to define writing relevant

concepts was examined both at the aggregate level (exam scores) and through disaggregated data

(item analysis). In order to enhance the validity of the findings, statistical analysis included a

variety of independent variables related to course type and individual student demographic

characteristics.

Data Collection

This study utilized data collected through Datatel, the computer software program used at

the community college and throughout the North Carolina Community College System.

Additional data was collected through the college English department and Writing Center. The sample size (n=165) for ENG 111 classes was deemed sufficient for factor analysis and validity. The sample size (n=94 for the ENG 112/114 follow-up cohort, though considerably smaller, was also deemed sufficient for analysis and validity. Data collected included items reported by instructors/administrators (test and semester grades, course information) and self-reported by students (age, gender, ethnicity, and race).

Exam Instrument

Data was collected using student scores on the ENG 111 Terms Exam that included student responses to 23 specific writing concepts (see Appendix A). Data collected included total scores on the exam as well as individual item scores. For each item on the exam, a score of 0, 3, or 5 points was possible. All students were allowed a maximum of fifty minutes to complete the exam. All exams were administered in a proctored environment. All exams were collected upon completion and submitted to the college Writing Center for assessment. To ensure the validity of exam scores, each exam was scored separately by two members of the English faculty in single-blind fashion. Conflicting scores were reconciled by a third reader, the director of the writing center.

Summary

The researcher hoped to demonstrate that there are associations between student performance on the writing terms exam and academic outcomes in composition sequences. Such associations would suggest a potential model for educational leaders, specifically department chairs, to fulfill the administrative requirement for quantifiable assessments to external stakeholders while also providing meaningful data for curriculum improvement to faculty. The

methods used in the design of this study should also contribute to research associated with

curriculum potential and working memory theory.

CHAPTER 4: RESULTS

This study examined a potential model for generating data useful to educational leaders for both institutional assessment by external stakeholders and also relevant to curriculum and program improvement. This chapter is organized in terms of the 3 research questions posed in Chapter 1. The first research question examines the association between student scores on the ENG 111 Terms Exam and student semester grades in ENG 111. Analysis related to this research question also includes Rasch Modeling of individual exam items to determine the comparative difficulty of each item. Secondly, this chapter also examines the association between student scores on the ENG 111 Terms Exam and data associated with subsequent composition courses, either ENG 112 or ENG 114. Finally, the study also considers associations between writing relevant knowledge as indicated by specific writing concepts included in the ENG 111 Terms Exam and composition courses.

The study population included all students(N=165) who completed ENG 111 (Expository Writing), the first course of a two semester composition sequence at a small community college in eastern North Carolina in the period between fall 2011 and fall 2012. The study population was majority female (64.9%), majority white (70.9%), and a majority (65.5%) were between 17-22 years in age. Ages of the study population ranged between 17-59 years in age. The study population also included all students who completed the entire two semester composition sequence, ENG 111 and either ENG 112 (Argument-Based Research) and ENG 114 (Professional Research and Reporting). All degree seeking students at the community college are required to take ENG 111 and either ENG 112 or ENG 114 as part of their general education requirements. Table 1 records numbers and percentages regarding study population

Table 1

Study Population Characteristics

Variable	N	% of Total
Gender		
Female	107	64.85%
Male	58	35.15%
Race		
Black	39	23.64%
Other	9	5.45%
White	117	70.91%
Age		
17-22	108	65.45%
23-28	15	9.09%
29.35	21	12.73%
36-45	11	6.67%
46+	10	6.06%
Teacher		
A	20	12.12%
B	19	11.52%
C	62	37.58%
D	13	7.88%
E	26	16.76%
F	14	8.48%
G	8	4.85%
H	3	1.82%
Exam Grade		
A	43	26.06%
B	14	8.48%
C	14	8.48%
D	13	7.88%
F	81	49.09%

Table 1 (*continued*)

ENG – 111 Grade		
A	48	29.09%
B	44	26.67%
C	44	26.67%
D	14	8.48%
F	15	9.09%
ENG – 112 Grade		
A	12	22.22%
B	11	20.37%
C	9	16.67%
D	6	11.11%
F	9	16.67%
I	1	1.85%
W	6	11.11%
ENG – 114 Grade		
A	20	45.45%
B	8	18.18%
C	9	20.45%
D	3	6.82%
F	2	4.55%
W	2	4.55%

Note. N=165.

characteristics: gender, race, teacher, terms exam grade, ENG 111 grade, ENG 112 grade, and ENG 114 grade.

The ENG 111 Terms Exam contained 23 items (see Appendix A). Items on the exam included terminology associated with composition and indicative of writing relevant knowledge. Exams were evaluated in blind fashion by two members of the English faculty using a range finder (see Appendix B). Student responses to each item on the exam received no credit (0 points), partial credit (3 points), or full credit (5 points). A third reader, the director of the college writing center, resolved any conflicting scores recorded by the two members of the English faculty.

The study described in this dissertation conducted Rasch modeling analysis to determine the relative difficulty on each item of the ENG 111 Terms Exam. Students received a score of either 0, 3, or 5 points for each item on the exam. Because Rasch modeling considers all exam responses as either correct or incorrect, item values were calculated using two scales. In the first, which will be referred to as the partial credit method, student responses to each item were recorded as either correct for any credit received (3 or 5 points) or incorrect (0 points). In the second, which will be referred to as the full credit method, student responses to each item were recorded as either correct (5 points) or incorrect (0 or 3 points).

Table 2 lists the difficulty of each exam item as indicated by Rasch Modeling consistent with Item Response Theory (IRT). In IRT analysis, item difficulties are usually scored on a standardized metric so that means are 0 and standard deviations are 1. Based on this metric, an item with a score of 0 would be considered of average difficulty, with the easiest and most difficult items indicated by the greatest negative and greatest positive values respectively (Furr, & Bacharach, 2013). Rasch Modeling of the terms exams indicated that under the partial credit

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Table 2

Rasch Modeling of Exam Item Difficulty Comparing Partial Credit to Total Credit Scores

Item	Partial credit	Full credit	Difference	Positive to Negative change
Item1(Rhetoric)	-0.0323	0.0811	0.1134	Yes
Item2(Narration)	-1.254	0.7187	1.9727	Yes
Item3(Causal Analysis)	-0.6461	1.2181	1.8642	Yes
Item4(Comparison/Contrast)	-1.4675	0.9816	2.4491	Yes
Item5(Classification/Division)	0.5306	1.8305	1.299	No
Item 6(Argument)	-0.9388	0.1156	1.0544	Yes
Item 7(Thesis Statement)	-0.5056	1.3411	1.8467	Yes
Item 8(Topic Sentence)	-0.3	1.2997	1.5997	Yes
Item 9(Paragraph)	-0.6817	1.5995	2.2812	Yes
Item 10(Introduction)	-0.7176	1.2181	1.9357	Yes
Item 11(Conclusion)	-1.4675	-0.5748	0.8927	No
Item 12(Unity)	-0.368	0.9053	1.2733	No
Item 13(Coherence)	0.034	0.7187	0.6847	No
Item14(Paragraph Transitions)	-1.4235	-0.401	1.0225	No
Item 15(Audience)	-3.3304	-1.1559	1.745	No
Item 16(Sentence Fluency)	-1.3376	0.7926	2.1302	Yes
Item 17Sentence Syntax)	0.8012	1.0984	0.2972	No
Item 18(Sentence Coherence)	0.5306	1.2587	0.7281	No
Item 19(Diction)	0.1661	0.6093	0.4432	No
Item 20(Voice)	-1.254	-0.0568	1.1972	No
Item21(Conventions)	-0.0655	0.0121	0.0776	Yes
Item 22(Revision)	-1.1725	-0.3319	0.8406	No
Item 23(Editing)	-1.3376	-0.7513	0.5863	No

method, scores range from -3.3 on item 15/audience to 0.8 in item 17/sentence syntax. Under the full credit model, scores ranged from -1.2 for item 15/audience to 1.8 for item 5/classification/division.

Both methods (partial or full credit) indicated that item 15/audience was the least difficult item on the exam. When scored using the partial credit scale, the margin between item 15/audience and the next easiest item (item 4/comparison/contrast, item 11/conclusion) is relatively large (-3.3 to -1.5), indicating that item 15/audience is considerably less difficult than any other item on the exam. A similar comparison using the full credit scale confirms the comparative lack of difficulty for item 15/audience with a score of -1.2 compared to the next easiest item (item 23/editing) with a score of -0.8.

Using the partial credit scale, item 17/sentence syntax was the most difficult with a score of 0.8. However, using the full credit scale, item 5/classification/division was the most difficult at 1.8. In fact, 7 items were more difficult on the full credit scale than item 17/sentence syntax. Table 2 also includes the spread between item values computed using the partial credit scale and the full credit scale. Accordingly, 9 items had a spread <1, 14 items had a spread >1, and 2 items had a spread >2. It can be inferred that items with the greatest spread were those items for which it was comparatively easy to receive partial credit but comparatively difficult to receive full credit. The item with the greatest spread was item 4/comparison/contrast with a spread of 2.4.

Similarly, it could be inferred that items with smallest spread were those items for which students typically did not receive partial credit. Item 21/conventions of language was the item with the smallest spread at 0.1. Item 17/sentence syntax was next at 0.3. Sentence syntax was rated as the most difficult question on the partial credit scale but only 8th hardest on the full

credit scale. However, its comparatively small spread suggested that it was the most difficult item on the exam followed by item 18/sentence coherence.

Table 3 indicates item values in ranges from the average value of 0 to the standard deviation, as indicated in Rasch Modeling, of 1. Based on the partial credit scale, the exam could be viewed as a comparatively easy with 18 negative values out of a total of 23. However, when applying the full credit scale, the exam appeared comparatively difficult with 17 positive values out of 23 items and 11 items moving from negative to positive values.

Table 4 compares the mean scores on the terms exam based on gender. The mean score for female students was 66.5 while the mean score for male students was 59.2. A t test was also performed but did not indicate any significance in scores based on gender.

Table 5 compares the mean scores and standard deviation on the terms exam based on race. The mean score for black students was 57.1, for white students 67.3, and for students classified as other 50.3. One way analysis of variance analysis (ANOVA) does not indicate a significant difference in test scores based on race.

Age distributions were also analyzed to determine any potential associations with performance on the ENG 111 Terms Exam. The mean age of students taking the exam was 24.7 with a range of 17-59 years in age. However, the majority of students (65.5%) were identified within the 17-22 age group. Table 6 includes percentages of each age group identified.

Scatter plot analysis was also conducted to identify any potential correlation between age and test scores. However, scatter plot analysis did not indicate any clear association between age and test scores, predicting the possibility of either a positive or negative effect based on age as indicated in Figure 1.

Table 3

Item Values in Range between Average Score and Standard Deviation

Partial credit	Full credit
1 item < -3	1 item < -1
8 items < -1	6 items < 0
18 items < 0	17 items > 0
5 Items > 0	8 items > 1

Table 4

Mean Test Scores, Standard Deviations, and t Test by Gender

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%	t Ratio	2 sided P-value
Female	107	66.5421	31.3005	3.0259	60.543	72.541	-1.5103	0.1335
Male	58	59.1897	29.0411	3.8133	51.554	66.826	---	---

Table 5

Mean Scores and Standard Deviations by Race, including ANOVA

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Black	39	57.1026	4.859	47.508	66.697
Other	9	50.3333	10.114	30.36	70.306
White	117	67.2906	2.805	61.751	72.83

ANOVA Source	DF	Sum of Squares	Mean Square	F Ratio	p- value
Race	2	4802.99	2401.50	2.6083	0.0767
Error	162	149153.71	920.70		
C. Total	164	153956.70			

Table 6

Distribution of Age, Including Mean and Standard Deviation

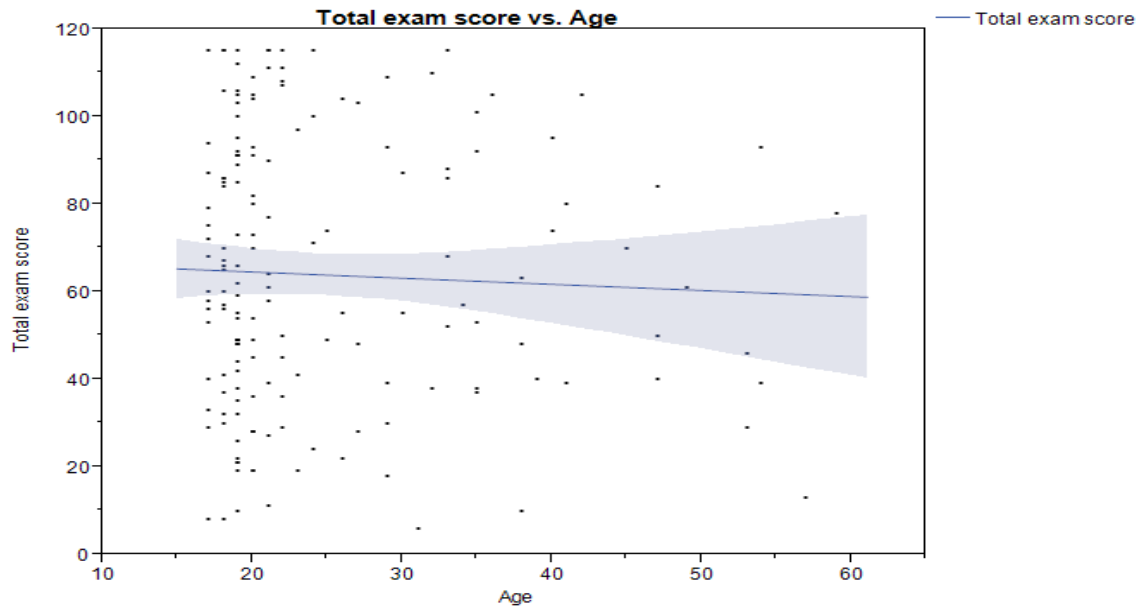| Distribution of Age	N	% of Total
Age		
17-22	108	65.45%
23-28	15	9.09%
29-35	21	12.73%
36-45	11	6.67%
46+	10	6.06%
Summary Statistics		
Mean	24.684848	
Std Dev	9.5743599	
Std Err Mean	0.7453629	
Upper 95% Mean	26.156593	
Lower 95% Mean	23.213104	
N	165	

Figure 1. Scatter plot graph indicates potential of either positive or negative effect of age on

terms exam score.

Having determined no significant statistical association between test scores and gender, race, or age, the association between instructors and exam grades was examined. This analysis indicated a clear association between student performance on the terms exam and instructor. Out of 8 possible instructors, 79% of the students of Instructor B passed the ENG 111 Terms Exam with a grade of at least C followed by 65% of the students of Instructor B. However, only 27% of the students of Instructor C passed with a grade of C. Further, Instructor C had the greatest number of students (N=62 out of a total of 165). Table 7 records numbers and percentages associated with grades for all instructors.

The research questions included in this study were designed to determine the association, if any, between academic outcomes in ENG 111, ENG 112, and ENG 114 and performance on the ENG 111 terms exam. However, in order to examine those associations, it was first necessary to determine the threshold of test performance that could be associated with an excellent academic outcome in ENG 111 as indicated by a semester grade of A. To determine this threshold, the mean score on test performance was calculated for all students who received a semester grade of A in ENG 111. Oneway analysis of total exam score based on a semester grade of A determined a mean score 80.9 for students who received a semester grade of A in ENG 111 compared to a mean score of 57.0 for all other students. Based on this finding, a score of 80 was defined as the threshold to be associated with academic excellence as indicated by a semester grade of A for subsequent analysis involving ENG 112 and ENG 114. Figure 2 includes a box plot analysis, sometimes referred to as a quantile plot. The rectangular box in the box plot analysis indicates the middle 50% of each group, with the horizontal line within the box indicating the median (50th percentile). The box plot included in Figure 2 indicates that 50% of

Table 7

Grade Percentages on ENG 111 Terms Exam by Instructor

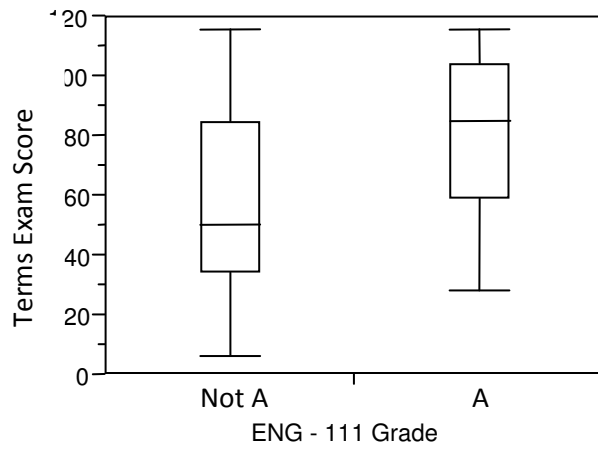| Teacher	A%	B%	C%	D%	F%	N
A	40.00%	5.00%	20.00%	5.00%	30.00%	20
B	57.89%	15.79%	5.26%	10.53%	10.53%	19
C	14.52%	9.68%	3.23%	12.90%	59.68%	62
D	30.77%	0.00%	7.69%	0.00%	61.54%	13
E	19.23%	15.38%	11.54%	3.85%	50.00%	26
F	28.57%	0.00%	7.14%	7.14%	57.14%	14
G	0.00%	0.00%	25.00%	0.00%	75.00%	8
H	66.67%	0.00%	0.00%	0.00%	33.33%	3

Figure 2. Box plot graph comparing scores on English 111 Terms Exam for ENG 111 students

who received A to those who did not receive A.

the students who received an A in ENG 111 scored 80 or better on the terms exam while 75% of those who did not received lower scores.

The mean score on the ENG 111 Terms Exam for students receiving an A in ENG 111 was 80.9 while the mean score for those students who did not receive an A was 57.0 (see Table 8). A *t* test analysis did indicate a significant association between score on the ENG 111 Terms Exam and an A in ENG 111.

Similar analysis was performed to determine the mean scores on the terms exam for students receiving a semester grade of A in either ENG 112 or ENG 114. Students receiving a grade of A in ENG 112 recorded an mean score of 81.9 (as compared to a mean score of 62.0 for those who did not receive an A) while those receiving a grade of A in ENG 114 recorded a mean score of 75.8 (as compared to 57.7 for those who did not receive an A). A *t* test did indicate a significant association between score on the ENG 111 Terms Exam and an A in ENG 112 (see Table 9) but did not indicate a significant association between score on the ENG 111 Terms Exam and an A in ENG 114.

Figure 3 depicts the box plot graph for ENG 112 students who received an A. The box plot for ENG 112 depicted in Figure 3 is similar to the box plot for ENG 111, indicating that nearly 50% of the students who received an A in ENG 112 and achieved a score of 80+ on the ENG 111 Terms Exam performed better than 75% of those who did not.

Data for ENG 114 indicated a mean score of 75.8 on the ENG 111 Terms Exam for students who received an A compared to mean score of 57.7 for those who did not (see Table 10). Once again, *t* test values did not indicate a significant association between ENG 111 Terms Exam scores and a grade of A in ENG 114 (see Table 10).

Table 8

Mean Scores on ENG 111 Terms Exam for Students with A in ENG 111, including t test

Grade	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%	T Ratio	2 sided P-value
Not A	117	56.9915	30.0599	2.779	51.487	62.496	5.244	<.00001*
A	48	80.9375	25.1052	3.6236	73.648	88.227	---	---

Table 9

Mean Scores on ENG 111 Terms Exam for Students Receiving A in ENG 112, including t test

Grade	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%	t Ratio	2 sided P- value
Not A	42	62	29.5263	4.556	52.799	71.201	2.408	0.025*
A	12	81.9167	23.9069	6.9013	66.727	97.106	---	---

Figure 3. Box plot graph comparing scores on ENG 111 Terms Exam for ENG 112 students who

received A to those who did not receive A.

Table 10

Mean Scores on ENG 111 Terms Exam for Students Receiving A in ENG 114, including t test

Means and Std Deviations

Grade	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%	t Ratio	2 sided P- value
Not A	25	57.76	32.4143	6.4829	44.38	71.14	1.944	0.059
A	20	75.8	29.6836	6.6375	61.908	89.692	---	---

The box plot graph for ENG 114 (see Figure 4) students differs somewhat from those for ENG 111 and ENG 112. First, 75% of students who received an A in ENG 114 scored better on the ENG 111 Terms Exam than 50% of those who did not. However, the median scores on the ENG 111 Terms Exam for students who received an A in ENG 114 was 75.8 compared to 57.76 for those who did not, suggesting that performance on the ENG 111 Terms Exam was not as closely associated with academic excellence in ENG 114 as it was for ENG 111 and ENG 112.

Having established a score of 80 on the terms exam as the threshold at which academic excellence might be associated, it was now possible to address the primary focus of the research questions, i.e. the association between academic excellence in ENG 111, ENG 112, and ENG 114 as indicated by a semester grade of A and performance on the ENG 111 Terms Exam. Statistical analysis indicated that 46.6% of students who achieved an A in ENG 111 scored 80+ on the ENG 111 Terms Exam while only 19.6% of students who received an A did not. Fisher's exact test (see Table 11) indicated statistical significance associated with this comparison.

A similar analysis was performed for ENG 112 and is recorded in Table 12. However, Fisher's exact test values were not found to be significant in this analysis of ENG 112.

A similar analysis was performed for ENG 114 and is recorded in Table 13. Just as with ENG 112, Fisher's exact test values were not found to be significant in this analysis of ENG 114. However, the differences in percentage between students who received an A in either ENG 112 or ENG 114 and scored 80+ on the terms exam were roughly equivalent, 12.4% to 14.1%. And for all three courses (ENG 111, ENG 112, and ENG 114), higher rates of achievement were going in the positive direction, i.e. a grade of A in ENG 111, ENG 112, or ENG 114, was associated with a grade of 80+ on the ENG 111 Terms Exam.
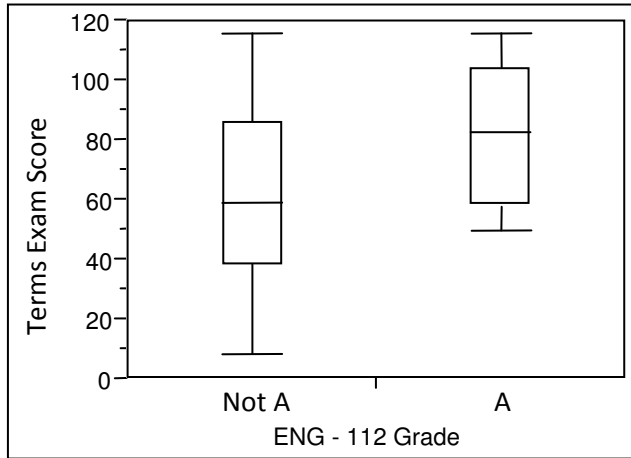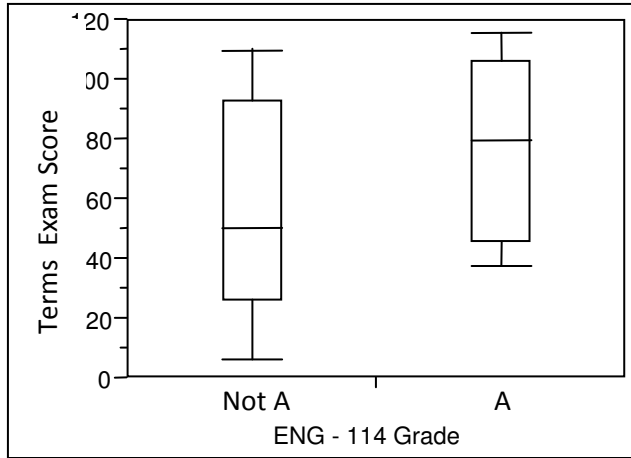
Figure 4. Box plot graph comparing ENG 111 Terms Exam scores for ENG 114 students who received A and those who did not receive A.

Table 11

Association of ENG 111 Grade of A by Terms Exam Score 80+, including Fisher's Exact Test

Grade	Not A	A	N	2 Tail Fisher's Exact Test P-value
<80	86	21	107	0.0005*
%	80.37	19.63	---	---
80+	31	27	58	---
%	53.45	46.55	---	---
N	117	48	165	---

Table 12

Association of ENG 112 Grade of A by Terms Exam Score 80+, including Fisher's Exact Test

Grade	Not A	A	N	2 Tail Fisher's Exact Test P-value
<80	28	6	34	0.3261
%	82.35	17.65	---	---
80+	14	6	20	---
%	70	30	---	---
N	42	12	54	---

Table 13

Association of ENG 114 Grade of A by Terms Exam Score 80+, including Fisher's Exact Test

Grade	Not A	A	N	2 Tail Fisher's Exact Test P-value
<80	16	10	26	0.3792
%	61.54	38.46	---	---
80+	9	10	19	---
%	47.37	52.63	---	---
N	25	20	45	---

Just as previous analysis indicated an association between instructor and grade on the ENG 111 Terms Exam, Table 14 records the percentages of students by instructor scoring 80+ on the ENG 111 Terms Exam. This data indicated further analysis by instructor was warranted.

To further examine the association between instructor and a score of 80+ on the ENG 111 Terms Exam, an additional analysis of the students of Instructor C was performed (see Table 15). Instructor C was chosen because he/she had the greatest number of students of all instructors who taught ENG 111. This analysis indicated that 24.1% of the students of Instructor C achieved a score of 80+ on the ENG 111 Terms Exam compared to 41.8% of the students for all other instructors. Fisher's exact test indicated a significant association between scores on the ENG 111 Terms Exam and whether a student had Instructor C or another instructor.

Statistical analysis determined that a significant association existed between a semester grade of A in ENG 111 and a ENG 111 Terms Exam score of 80+, as well as implied that positive associations exist, although not to the extent that they can be deemed statistically significant, between semester grades of A in ENG 112 and ENG 114 and scores of 80+ on the ENG 111 Terms Exam. Analysis also indicated a significant association between instructor and student scores of 80+ on the ENG 111 Terms Exam. Final analysis was conducted to determine potential avenues to improve both student outcomes and instructor performance. This analysis attempted to determine whether grouping items indicated by Rasch Modeling to be more difficult could be associated with scores of 80+ on the ENG 111 Terms Exam and thus might be predictive of higher grades in ENG 111 and possibly ENG 112 and ENG 114.

To perform this analysis, the two most difficult items as indicated by Rasch Modeling using the partial credit scale (item 17) and the full credit scale (item 5) were combined with a third, moderately difficult item (item 13). In this analysis, only item scores receiving 5 points,

Table 14

Percentages by Instructor of Terms Exam Score 80+

Teacher	<80	80+	N
A	50.00%	50.00%	20
B	26.32%	73.68%	19
C	75.81%	24.19%	62
D	69.23%	30.77%	13
E	65.38%	34.62%	26
F	71.43%	28.57%	14
G	100.00%	0.00%	8
H	33.33%	66.67%	3

Table 15

Association of Instructor C by Terms Exam Score 80+, including Chi Square and Fisher's Exact Test

Instructor C	<80%	80+%	N	2 Tail Fisher's Exact Test P-value
No	58.25%	41.75%	103	0.0284*
Yes	75.81%	24.19%	62	---

the maximum possible points per item on the exam, were considered. This analysis indicated that 25 students of the total of 165 received full credit for all three questions and that all of those students (100%) achieved a score of 80+ on the ENG 111 Terms Exam (see Table 16).

A similar analysis was performed with the easiest item as indicated using Rasch Modeling on both the partial credit scale and the full credit scale to provide a point of comparison. This analysis indicated that 118 students received full credit for item 15 but only 34.8% of those students received a score of 80+ on the ENG 111 Terms Exam (see Table 17).

The results indicated that academic excellence in ENG 111 as indicated by a grade of A was associated with a score of 80+ on the ENG 111 Terms Exam. Similar, although statistically less robust associations, were observed for both ENG 112 and ENG 114. Also, demographic analysis did not indicate any significant bias inherent in the ENG 111 Terms Exam in relation to gender, race, or age.

 To summarize, results indicated several potential applications for educational leaders, especially department chairs, for both institutional assessment and also curriculum improvement. Bivariate and univariate analysis did not indicate any significant bias related to the ENG 111 Terms Exam with regard to gender, race, or age. Comparison involving Rasch modeling using the partial and full credit scales indicated that the ENG 111 Terms Exam could be considered to be moderately difficult. Further analysis established that a mean score of 80+ on the ENG 111 Terms Exam was associated with academic excellence in ENG 111, ENG 112, and ENG 114 as indicated by a grade of A. Rasch modeling also indicated which items on the ENG 111 Terms Exam could be considered more difficult, and subsequent analysis indicated that student performance on those items could be associated with a score of 80+ on the ENG 111 Terms

Table 16

Association of Difficult Test Items by Terms Exam Score 80+

5, 13, and 17	<80%	80+%	N
Not full credit	76.43%	23.57%	140
Full credit	0.00%	100.00%	25

Table 17

Association of Least Difficult Test Item by Terms Exam Score 80+

5	<80	80+	N
Not full credit	63.83%	36.17%	47
Full credit	65.25%	34.75%	118

Exam. Additional analysis indicated that an association between instructor and scores of 80+ on the ENG 111 Terms Exam. Collectively, those results provide educational leaders at the community college quantifiable assessments of student learning related to the ENG 111 Terms Exam and also composition courses. Further, the results also indicate potential areas for targeted professional development of faculty and curriculum improvement.

CHAPTER 5: DISCUSSION

This chapter includes a summary of the study and conclusions drawn from the data presented in Chapter 4. It also discusses implications for action as well as recommendations for further research. Chapter 5 is organized as follows: summary of the study, findings related to the literature, and conclusions.

Educational leaders today are under pressure to identify methods to satisfy the dual, yet distinct, purposes of institutional assessment, i.e. to satisfy the demands for accountability by external stakeholders and to provide the data necessary for internal improvement including in the area of curriculum. In most institutions of higher education, and especially at community colleges, educational leaders at the department chair level or equivalent are the persons most directly responsible for quality issues related to institutional assessment. In order to fulfill the duties required in their positions, department chairs must balance the perhaps conflicting goals of administrators and faculty regarding institutional assessment. In no area is achieving such balance more difficult than in curriculum.The long held values, even requirements, resulting from traditions of academic freedom and shared governance, place the primary responsibility for all curriculum matters with faculty. However, as the percentage of full-time faculty employed in higher education has declined over the past two decades, faculty workloads have increased in other areas including advising and committee work, which, in turn, has increased the administrative workloads of department chairs including in the area of curriculum. The demand for institutional assessment by external stakeholders, especially for the quantifiable measurement of student learning outcomes, has also exacerbated administrative pressure on department chairs to assert themselves more directly into curriculum matters.

The purpose of this study was to test an empirical model through which educational leaders can produce quantitative assessments of curriculum with the potential to satisfy both the requirements of institutional assessment to external stakeholders and also to provide meaningful data for curriculum and program improvement. To construct such a model, it was necessary to employ multiple conceptual frameworks. The first involved the concept of curriculum potential that suggests that curriculum be viewed as a set of possible rather than intended learning outcomes. The model employed in this study incorporated features of the German *Didaktik* tradition which stipulates that curriculum potential be evaluated in terms of exemplary value, contemporary meaning, future meaning, content structure, and pedagogical representation (Klafki, 2000). One of the key instruments involved in this study was the ENG 111 Terms Exam, an examination of writing concepts applied in ENG 111 (Expository Writing) and in subsequent composition courses ENG 112 (Argument-Based research) and ENG 114 (Professional Research and Reporting) at a small community college in eastern North Carolina. The construction of a terms exam necessitates that faculty identify foundational concepts within their disciplines and/or individual courses, an activity which requires that course content be considered in light of exemplary, contemporary, and future meaning.

Secondly, the design of this study was based on the premise, supported by research, that quantifiable assessment of student learning in disciplines including the humanities and social sciences is less standardized, if not more difficult, than in disciplines such as the natural or physical sciences and mathematics. Implicit in this premise is the warrant that quantifiable assessment is desirable. Applying this premise, this study built upon a second conceptual framework, working memory, which suggests that people perform tasks involving processes more efficiently and more competently if they have first acquired certain knowledge or skills.

Previous research suggests the acquisition of writing relevant knowledge in working memory is associated with improved results in writing. By examining the associations between student performance on an examination of terminology indicative of writing relevant knowledge and academic performance in a two-semester composition sequence, this study contributes to research involving working memory and writing.

The specific research questions addressed in this study were as follows:

- Question 1--What is the association between student scores on the ENG 111 Terms Exam and student semester grades in ENG 111?

- Question 2—What is the association between student scores on the ENG 111 Terms Exam and subsequent composition courses, either ENG 112 or ENG 114?

- Question 3—What is the association between writing relevant knowledge , i.e. specific writing concepts, and academic excellence in composition courses?

The answers to these research questions provide information relevant to working memory research. However, those answers also provide data essential for considering the curriculum potential of the ENG 111 Terms Exam within the final two areas of the *Didaktik* tradition, content structure and pedagogical representation.

The methodology employed in the study involved first an examination of the ENG 111 Terms Exam. Students received a score of either 0, 3, or 5 points for each item on the exam. For this study, Rasch modeling was conducted to determine the comparative difficulty of each item on the exam. However, Rasch modeling requires that each exam response be coded as correct or incorrect. In other words, Rasch modeling does not allow for a consideration of partial credit. Therefore, difficulty values for each item on the exam were calculated using two scales, a partial credit scale in which student responses were coded as correct for any response receiving 3 or 5

points and a full credit scale in which student responses were coded as correct for any response receiving 5 points. Differences in values between the two scales were also determined for each item.

Secondly, *t* test analysis was conducted to determine any differences in student performance on the ENG 111 Terms Exam based on gender, and ANOVA analysis was conducted to determine any differences based on race. Scatterplot analysis was then performed to identify differences in student performance on the ENG 111 Terms Exam based on age. Grade distributions based on instructor were also examined.

Next, box plot analysis, mean scores, and standard deviations were calculated to determine the threshold at which student performance on the ENG 111 Terms Exam could be associated with a semester grade of A in ENG 111, ENG 112, and ENG 114.

Determining a score of 80+ as the threshold at which student performance could be associated with a grade of A in ENG 111 marked a pivot point for the direction of the methodology. In order to provide information essential to curriculum and program improvement, it was necessary to examine which associations, if any, could be determined between student performance in ENG 111, ENG 112, and ENG 114 and performance on the ENG 111 Terms Exam, not the reverse. Having established 80+ as the mean score that could be associated with a semester grade of A in ENG 111, it was now possible to perform Fisher's exact test to determine the likelihood that student would achieve a grade of A in ENG 111 and also in ENG 112 or ENG 114 based on their score on the ENG 111 Terms Exam.

The final steps of the methodology involved methods designed to identify potential directions for administrative actions designed to lead to program and curriculum improvements. These steps included an examination of the association between instructor and scores of 80+ on

the ENG 111 Terms Exam. Finally, analysis was performed to determine which items were most closely associated with a score of 80+ on the ENG 111 Terms Exam.

These steps produced some interesting findings. Fisher's exact test analysis indicated a significant association between instructor and a score of 80+ on the ENG 111 Terms Exam (see Table 14). To further examine this association a subsequent analysis was performed comparing the students of Instructor C with the students of all other instructors. Instructor C was selected because he/she taught the greatest number of ENG 111 students. This analysis indicated that 24.2% of the students of Instructor C scored 80+ on the ENG 111 Terms Exam compared to 41.8% of the students for all other instructors. Fisher's exact test indicated statistical significance in this association. Findings such as this provide meaningful data for educational leaders to consider when planning the best use of professional development resources and activities designed to improve instructional practices.

Finally, the study determined that students who receive full credit on exam items indicated to be more difficult under Rasch modeling are more likely to achieve scores of 80+ on the ENG 111 Terms Exam. For instance 100% of all students (N=25) who received full credit for item 5/classification division, item 13/coherence, and item 17/sentence syntax scored 80+ on the ENG 111 Terms Exam (see Table 16). For the purpose of comparison, only 34.8% (N=118) of students who received full credit on the easiest item, item 15/audience, achieved a score of 80+ on the ENG 111 Terms Exam (see Table 17). The association between performance on more difficult items and a score of 80+ on the ENG 111 Terms Exam helps to identify specific concepts for increased instructional emphasis that could lead to better achievement of benchmarks related to academic excellence.

Major Findings

Major findings did not indicate any significant differences in performance on the ENG 111 Terms Exam based on gender, race, or age. The mean score for females on the ENG 111 Terms Exam was 66.5 with a standard deviation of 31.3 while the mean score for males was 59.2 with a standard deviation of 29.0. A *t* test analysis did not indicate that these differences were statistically significant (see Table 4). Similarly, the mean score for white students on the ENG 111 Terms Exam was 67.3, for black students 57.1, and for students classified as other 50.3. Once again, ANOVA analysis did not indicate any statistical significance in differences in exam performance based on race (see Table 5). Scatterplot analysis of performance on the ENG 111 Terms Exam based on age failed to reveal any clear association between the independent and dependent variables, indicating the possibility of either a positive or negative effect (see Figure 1). These findings suggest that the ENG 111 Terms Exam does not contain any inherent bias based on gender, race, or age.

Further analysis of the ENG 111 Terms Exam applied Rasch Modeling to determine the comparative difficulty of the 23 items included on the exam. Students received a possible score of 0, 3, or 5 points for each item on the exam. Rasch Modeling was performed on each item using two scales, a partial credit scale in which answers receiving either 3 or 5 points were designated as correct and a full credit scale in which only items receiving 5 points were designated as correct. In Rasch Modeling, the comparative ease of questions is indicated by greater negative values and more difficult questions are indicated by greater positive values. Applying the partial credit scale, item values ranged from -3.3 to 0.8. Applying the full credit scale, item values ranged from -1.2 to 1.8 (see Table 2). Item 15 (audience) was calculated to be the least difficult item applying either the partial credit or full credit scale. However, item 17

(sentence syntax) was calculated to be the most difficult item using the partial credit scale while item 5 (classification/division) was the most difficult applying the full credit scale. Differences in spread between Rasch Modeling values using both scales were also calculated. Higher spread values comparing Rasch Modeling scores for each item using the two scales indicate those items for which it is relatively easy to attain partial credit but comparatively difficult to attain full credit. High spread values, therefore, allow educational leaders such as department chairs to target specific concepts with the greatest potential to benefit from curriculum enhancement practices and the professional development of faculty. Interestingly, the three items with the greatest spreads were item 4 (comparison/contrast), item 9 (paragraph), and item 16 (sentence fluency), all of which went from negative values indicating comparative ease to positive values indicating comparative difficulty when applying the partial credit scale versus the full credit scale. By providing a statistical measure of the margin between partial understanding and full understanding of concepts, Rasch Modeling such as this can assist educational leaders not only in identifying quantifiable assessments of student learning to external stakeholders but also in planning program improvements based on those findings.

Items with the smallest spread in values applying Rasch Modeling using the partial credit scale versus the full credit scale indicate those items in which students tended to receive full credit or no credit at all. However, one cannot assume that such items are necessarily difficult. For instance, the item with the smallest spread (0.1) was item 21 (conventions of language) which had comparatively neutral values indicated by Rasch Modeling, -0.1 under the partial credit scale to <0.1 under the full credit scale. Of 91 of 165 total students receiving at least partial credit on item 21, 84 received full credit, over half the total of all students. However, one of the most difficult items, item 17 (sentence syntax), had the second smallest spread (0.3). Only

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65 students received even partial credit for item 17, the smallest number for any item on the exam, 54 of whom received full credit. This finding indicates that fewer than half of all students could demonstrate any understanding of sentence syntax, once again providing educational leaders a quantifiable measurement of student learning as well as a potential area for curriculum improvement.

In all, under the partial credit scale, Rasch Modeling indicated negative values on 18 of the 23 items. However, applying the full credit scale, 11 of those 18 changed in value from negative to positive, for a total of 17 positive values. With a value of 0 indicating an average score for each item under Rasch Modeling, the values associated with the ENG 111 Terms Exam suggest that this exam provides an effective measure of student knowledge of the writing concepts included on the exam.

Having determined that the ENG 111 Terms Exam is an effective exam and that no significant evidence of gender, race, or age bias exists, distributions of grades based on instructor were calculated. This analysis did indicate an association between instructor and student score on the ENG 111 Terms Exam. A total of 8 instructors were included in the data. Of those 8, 79% of students of Instructor A passed the ENG 111 Terms Exam with a grade of C or better followed by students of Instructor B at 65%. However, only 27% of students of Instructor C passed with a grade of C or better. Further, Instructor C had the greatest number of students with 62 of 165 (see Table 7). While educational leaders must be careful to use assessment data for institutional improvement rather than faculty evaluation, findings such as this do provide educational leaders with information that can be used to direct professional development resources more efficiently to faculty to improve student outcomes. Conceivably, such information might also assist scheduling decisions.

One of the primary objectives of the research questions included in this study was to examine the association between academic outcomes in composition courses and the ENG 111 Terms Exam. In order to accomplish this objective, it was necessary to identify the threshold at which ENG 111 Terms Exam scores could be associated with academic excellence as indicated by a semester grade of A. The mean score on the ENG 111 Terms Exam for students receiving a semester grade of A in ENG 111 was determined to be 80.9. As a point of comparison, the mean score for students who did not receive a semester grade of A was 57.0. A t test indicated statistical significance for values associated with total exam scores and an ENG 111 grade of A. Box plot, sometimes referred to as quantile plot, analysis indicated that 50% of all students who received an A in ENG 111 performed better on the ENG 111 terms Exam than 75% of those who did not (see Figure 2). Analysis examining associations between semester grades of A ENG 112 and ENG 114 and exam scores on the ENG 111 Terms Exam reached similar, although less robust, findings. However, significant t test values were found regarding the association between semester grades of A in and scores on the ENG 111 Terms Exam for all three courses: ENG 111 (see Table 8), ENG 112 (see Table 9), and ENG 114 (see Table 10).

The average mean score associated with a grade of A in ENG 111, ENG 112, or ENG 114 was found to be 79.6. Rounding to the nearest whole number, a score of 80 was identified as the threshold to be used in Fisher's exact test analysis to associate academic excellence as indicated by grade of A in composition courses with a score of 80+ on the ENG 111 Terms Exam. Fisher's exact test analysis did indicate statistical significance in the association between a grade of A in ENG 111 and a score of 80+ on the ENG 111 Terms Exam. Further, 46.6% of students who received a grade of A in ENG 111 scored 80+ on the ENG 111 Terms Exam while only 19.6% of those who received an A scored less than 80 (see Table 11). However, similar

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Fisher's exact test analysis of students receiving an A in either ENG 112 (see Table 12) or ENG 114 (see Table 13) did not indicate a significant association with score of 80+ on the ENG 111 Terms Exam. However, it was interesting to note that for both ENG 112 and ENG 114 the margin between groups of students who received a grade of A and scored 80+ on the ENG 111 Terms Exam fell between 12%-14%, indicating that some association does exist. From this, we can conclude that the association between semester grade and exam performance is greater for ENG 111 than for ENG 112 and ENG 114.

Findings Related to the Literature

This study adds to the literature associated with the concept of curriculum potential. In particular, it provides educational leaders a model for analyzing curriculum potential through the German *Didaktik* tradition which is largely unknown in English speaking countries (Deng, 2011). Within the *Didaktik* tradition, Klafki (2000) proposes that curriculum potential be evaluated through a five-step set of questions for exemplary value, contemporary meaning, future meaning, content structure, and pedagogical representation. The implementation of an exam designed to assess student ability to define foundational concepts within a curriculum, such as the ENG 111 Terms Exam, requires that educational leaders such as department chairs either direct or facilitate the efforts of appropriate faculty to evaluate curriculum concepts in terms of exemplary value, contemporary meaning, and future meaning. Rasch Modeling and other analyses that examine both exam items as well as demographic data associated with student characteristics and instructors provide data essential for refinement of content structure and pedagogical representations. In evaluating curriculum potential through these five steps, educational leaders can achieve quantifiable measurements of student learning that are essential to achieving the type of institutional assessment that external stakeholders demand. Additionally,

this study demonstrates that this five-step process, as applied to a terms exam in certain settings, can provide educational leaders, especially department chairs, with data that identifies specific areas for potential improvement of instruction and curriculum.

This study also adds to the body of literature associated with working memory and writing outcomes. Specifically, it provides further evidence of the association between writing relevant knowledge and writing outcomes as indicated by academic excellence in composition courses.

Implications for Action

This study demonstrated a model through which educational leaders can achieve quantifiable assessment of student learning outcomes that can contribute to institutional assessment and also indicate specific areas for curriculum and program improvement. Specifically, the implementation and assessment associated with an examination of foundational concepts within a specific discipline, in this case English composition, provided data useful for institutional assessment and program improvement through the five-step *Didaktik* process in which curriculum potential is evaluated in terms of exemplary value, contemporary meaning, future meaning, content structure, and pedagogical representation. Determining statistical significance in the association between mean scores on the ENG 111 Terms Exam with academic excellence in composition courses identified potential benchmarks, as well as quantitative measurements, indicative of student learning outcomes that could be used to demonstrate institutional assessment. Further, by applying Rasch modeling to identify those concepts that can be most closely associated with academic excellence, specific concepts in which strategies to improve curriculum practices might prove most beneficial can be identified. Finally, this study also demonstrated a method for examining the association between demographic characteristics,

including instructor, and specific elements of academic performance that can be associated with academic excellence. The model applied in this study could prove especially useful in disciplines in which quantifiable assessments of student learning is comparatively difficult.

Recommendations for Future Research

Additional research is necessary to determine the applicability of the model employed in this study in disciplines other than English composition and within other institutional cultures. The college included in this study was a small community college in eastern North Carolina, and the findings may not be generalizable to larger institutions or those in more urban settings. Further, the demographic characteristics of the study population did not reflect wide diversity, particularly in terms of age or race.

Subsequent research should be also conducted to determine whether the concepts most closely associated with academic excellence and other exam characteristics as identified in this study remain constant over time. Additionally, future research should consider associations between conceptual knowledge and academic excellence as indicated by measurements other than exam scores and grades in composition courses. For instance, individual concepts might be evaluated by rubric on writing instruments to examine the association between conceptual knowledge and writing outcomes. This research would contribute to the body of literature regarding working memory, particularly with working memory and writing.

The five-step process associated with the evaluation of curriculum potential through the *Didaktik* tradition also holds great potential for future research. As applied to this study, future research could examine how content structure and pedagogical representations were affected by the findings of this study. Currently, little research exists that focuses on curriculum potential as

it relates to educational leadership, particularly in the assessment of curriculum, instruction, and student learning. Such a focus holds great potential for future research.

Ultimately, this study was able to demonstrate a model through which educational leaders might both achieve quantifiable assessment of student learning for use in institutional assessment and also identify data meaningful for curriculum and program improvement. This finding is not surprising in that this study provides a good example of curriculum practice informing curriculum theory rather than the reverse. Still, such models are comparatively rare despite increasing pressure on educational leaders to develop or at least to find them. The development of such models will require educational leaders who combine the knowledge of curriculum and disciplinary expertise necessary to lead faculty effectively with an understanding of the type of quantifiable assessments that are necessary to satisfy demands for accountability by external stakeholders. This study helps address that need.

Conclusions

This study has demonstrated that academic excellence as indicated by a grade of A in composition courses can be associated with performance on an exam in which students are required to define writing relevant concepts. By applying the principles of the *Didaktik* tradition to consider the potential, rather than the intended, outcomes of curriculum, educational leaders may be able to direct and/or facilitate the design and implementation of similar exams in disciplines in which quantifiable measurement of student learning has been historically scarce. A terms exam allows for the direct measurement of student acquisition of foundational concepts deemed important within a given discipline. It should be noted, however, that such an exam will probably prove most useful in combination with other assessments designed to evaluate the application of foundational concepts within other contexts.

This study demonstrated a model capable of providing educational leaders with quantifiable measurements of student learning that could potentially be used for institutional assessment to satisfy the demands for accountability to external stakeholders. It also identified specific elements of student performance that can be associated with academic excellence, thereby establishing potential area for program improvement. This study also provided data potentially useful to educational leaders at the community college included in the study in determining the best allocation of resources designed to improve instructor performance.

There is little evidence that demands for accountability have begun to infringe upon faculty autonomy in curriculum matters. However, the institutional need to produce quantifiable assessments of student learning outcomes will undoubtedly affect both administrators and faculty. Educational leaders whose responsibilities place them in the middle ground between institutional assessment and faculty control of curriculum must develop methods to balance the concerns of each. Many of those who are most vocal in demanding that colleges be held more accountable to stakeholders may not fully understand the complexities involved in meaningful curriculum assessment and improvement. On the other hand, faculty resistance to what they see as intrusion into a domain for which they are exclusively responsible has often been characterized by defensive postures rather than active engagement.

Educational leaders who fail to develop practices that will satisfy the demands of institutional assessment while also providing data meaningful to curriculum improvement run the risk of having those practices defined for them by persons who may not have the educational expertise necessary to make these decisions. At the same time, those educational leaders must convince faculty of the necessity to respond to demands for quantifiable assessment of student learning. Whether studies such as this can help combat the perception that higher education

needs to be "fixed" remains to be seen. However, if educational leaders fail to define and to

assess what constitutes a meaningful curriculum, others will do it for them.

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APPENDIX A: ENG 111 TERMS EXAM

Student ID #_____

<u>ENG 111 Terms Exam</u>

Instructions:
Write only your student ID number in the upper right corner of this page. **DO NOT WRITE YOUR NAME ON THIS EXAM**.
In the spaces below provide the definitions for the terms listed. Each term is of equal weight in the grade and partial credit can be awarded.

- Rhetoric:

- Narration:

- Causal Analysis:

- Comparison/Contrast:

- Classification/Division:

- Argument:

- Thesis Statement:

- Topic Sentence:

- Paragraph:

- Introduction:

- Conclusion:

- Unity:

- Coherence:

- Paragraph Transitions:

- Audience:

- Sentence Fluency:

- Sentence Syntax:

- Sentence Coherence:

- Diction:

- Voice:

- Conventions of Language:

- Revision:

- Editing:

- # English 111 Writing Terms/ Definitions Range Finder
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- **Rhetoric:** Rhetoric is the <u>art of effective writing.</u> <u>Rhetorical strategies</u> are the foundation of effective writing.
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- ## _Rhetorical Strategies_
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- **Narration***:* Narration, <u>a story, is a strategy to relate a series of events that are linked in</u> <u>an orderly progression of time</u>. However, narrative time is not always chronological time. The writer determines the progression and organization of time that most effectively conveys the purpose of the narrative.
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- **Causal Analysis:** <u>Causal analysis is a strategy to analyze and explain the relationship between causes and effects</u>. Causes and effects often occur in a logical sequence, called a <u>causal chain</u>. As a result, causal analysis frequently explains why one link of the causal chain is connected to a following link to analyze and explain these relationships.
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- **Comparison/Contrast:** <u>Comparison is a strategy to explain the similarities between two or more subjects. Contrast is a strategy to explain the differences between two or more subjects</u>. The purpose of comparison and/or contrast is to reveal information about the subjects that <u>explains the subjects more clearly</u> or <u>evaluates the subjects</u> to establish advantages and disadvantages. Effective comparison/contrast <u>explains similarities and/or differences in a parallel form.</u>
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- **Classification/Division:** Classification and division are similar strategies of writing. <u>They both organize complex subjects to analyze and explain these complex subjects. Division separates a complex subject into sub-units. The subject is usually singular</u>. The division of the subject results from the writer's "principle of analysis." (Aaron, Repetto, 142). The complex subject is clarified when the audience understands its sub-units and the relationship between the sub-units. <u>Classification groups multiple subjects into categories. These categories follow a "principle of classification" that distinguishes each group</u>. (Aaron,Repetto, 168)The complex subjects are clarified when the audience understands the similarities and differences between the groups and the principles of classification that determined the groups.
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- **Argument:** <u>An argument attempts to convince or persuade the audience to accept the validity of the writer's thesis</u>. The development of an argument may involve one specific rhetorical strategy or multiple rhetorical strategies. Argument may appeal both to the audience's reason and emotion.
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- ***Components of Essay Writing***
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- **Thesis Statement:** The thesis must <u>restrict and unify the subject of your essay</u>. The thesis must use <u>precise vocabulary to clarify your meaning</u>.
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- **Topic Sentence:** The topic sentence <u>unifies the paragraph with the thesis</u>. It also <u>organizes the information</u> in the paragraph.
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- **Paragraph:** The paragraph is <u>a sub-unit of the development and organization of the thesis</u>. Typically, it is a group of sentences that are indented <u>to develop a single idea</u>. A topic sentence <u>unifies and organizes the paragraph</u>. However, depending on the writer's purpose, paragraph organization and development may vary.
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- **Introduction:** The introduction is not necessarily restricted to one paragraph. However, whether it is one paragraph or more, the introduction has essential functions. <u>It clarifies the thesis or controlling idea of the writing</u>. <u>It provides a "map" for the organization of the writing</u>. <u>It establishes the audience for the writing</u>.
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- **Conclusion:** The essential function of a conclusion is to <u>convey a sense of completeness</u> for the writing.
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- **Unity:** Writing is unified when <u>all elements are related</u>. Words relate the idea(s) in a sentence; sentences relate to the topic sentence of the paragraph; paragraphs relate to the thesis.
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- **Coherence:** Coherence creates <u>the "flow" between sentences and paragraphs that reinforce the unity</u> of ideas in the writing. There are four <u>basic methods to create this "flow"</u>: transitional expressions, repetition of key words and phrases, pronoun reference, and parallelism.
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- **Paragraph Transitions:** Paragraph transitions <u>clarify the relationship of one paragraph to the other.</u>
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- **Audience:** An audience is <u>the intended group of readers for your writing</u>. To write effectively you should <u>estimate your audience's knowledge of your subject, their interest in it, and their biases toward it.</u>
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- **Sentence Fluency:** Sentence fluency <u>establishes the "flow" or continuity of the ideas in sentences that develop the purpose of your writing</u>. Sentence fluency consists of **syntax** and **coherence**. See the following definitions.

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- **Sentence Syntax:** Sentence syntax is <u>the order in which words are arranged in a sentence</u> to convey the meaning of the sentence.

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- **Sentence Coherence:** Sentence coherence is <u>the continuity between sentences created by transitions.</u> There are four <u>basic methods</u> to create sentence coherence: transitional words, repetition of key words and phrases from sentence to sentence, pronoun reference, and parallelism.

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- **Diction:** Diction is the <u>precise choice and use of words</u> appropriate to your purpose and audience.

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- **Voice:** Voice is <u>the element of writing that conveys your unique understanding of the subject of your writing</u>. Your voice "speaks" to your audience. It is the "personality" of your writing.

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- **Conventions of Language:** Conventions of English are <u>the standard rules of grammar, punctuation and mechanics</u>. Conventions are crucial to effective writing.

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- **Revision*:*** Revision is <u>"re-seeing" your draft</u>. It <u>occurs during the entire writing process.</u> Reading to revise improves the meaning and organization of the drafts of your writing. Revision "...occurs beneath the line..." (Aaron, Repetto, 47)

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- **Editing:** Editing is <u>reading your draft to correct errors in grammar, punctuation or mechanics </u>"...editing occurs more on the line..." (Aaron, Repetto, 47)

APPENDIX C: IRB

EAST CAROLINA UNIVERSITY

University & Medical Center Institutional Review Board Office

4N-70 Brody Medical Sciences Building· Mail Stop 682

600 Moye Boulevard · Greenville, NC 27834

Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Exempt Certification

From: Social/Behavioral IRB

To: John Boyles

CC: Cheryl McFadden

Date: 3/12/2013

UMCIRB 13-000148

Re: Naming of the Parts: An Associative Study of Writing Relevant Knowledge, Working Memory, and Curriculum Potential

I am pleased to inform you that your research submission has been certified as exempt on 3/11/2013. This study is eligible for Exempt Certification under category #1.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period. The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418

IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418 IRB00004973