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Best Instructional Practices in Developmental Education: Faculty Perspectives

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BEST INSTRUCTIONAL PRACTICES IN DEVELOPMENTAL EDUCATION: FACULTY PERCEPTIONS

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DEDICATION

This dissertation is dedicated to my family members, who provided never-ending support throughout many years of master's and then doctoral work. I cannot recall a time when any of them ever expressed anything but encouragement, even though I abandoned them to their own devices many evenings and weekends while I attended class, studied, or wrote. To my mother Wilma Avis; my husband Jim; and my three children Kim, Kelsey, and Kevin: You mean the world to me.

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ABSTRACT

Best Instructional Practices in Developmental Education: Faculty Perceptions

Calisa A. Pierce

This descriptive study employed a survey to examine the perspectives of developmental education faculty members at public community colleges regarding instructional practices that have been identified in the literature as effective for developmental education. The study focused on two major areas related to the instructional practices surveyed: the degree to which faculty members perceive the practices to be effective and the degree to which they report they employ the practices. The entire population of West Virginia full-time faculty members teaching developmental education regularly in public community and technical colleges was surveyed with an 89.6% response rate. In addition, demographic information was collected and examined in an ex post facto design in order to determine whether there was a difference in faculty members' perceptions of instructional practice effectiveness and the frequency of use of these practices related to subject area taught and to various other independent demographic variables. Survey items with a majority of faculty ratings above mid-scale were designated as critically important; of the eighteen identified instructional practices, sixteen were designated as critically important.

CHAPTER ONE: INTRODUCTION

With decreased higher education funding and increased demand for public accountability in higher education, developmental education in America has been a controversial topic for a number of years. Legislators and the general public have questioned the need for and effectiveness of developmental education while developmental educators have attempted to prove the benefits to students. Secondary public education has come under more and more scrutiny, questioning the taxpaying public's funding of teaching of the same subjects twice, once in secondary schools and once in higher education institutions. Secondary schools themselves are facing greater accountability at the same time as they are experimenting with various measures to improve graduation rates. Philanthropist Melinda Gates has called for innovation in developmental education, stating, "Our research indicates that improving remediation is the single most important thing community colleges can do to increase the number of students who graduate" (Gonzalez, 2010). With this goal in mind, an examination of effective developmental education instructional practices is appropriate and timely. This study examined faculty perspectives about teaching methods that work well in developmental education classes.

Background

The scholarly study of developmental education is a relatively new field, beginning in the 1970s with a few studies but mostly gaining prominence in the latter decades of the twentieth century. According to the National Association for Developmental Education (NADE) Fact Sheet (2011), NADE was founded in 1976 as the

National Association for Remedial/Developmental Studies in Postsecondary Education. Justifying the existence of and demonstrating the success of developmental education has been one major thrust of research over the past 30 years. NADE has defined developmental education on its website as follows:

> Developmental education is a field of practice and research within higher education with a theoretical foundation in developmental psychology and learning theory. It promotes the cognitive and affective growth of all postsecondary learners, at all levels of the learning continuum. Developmental education is sensitive and responsive to individual differences and special needs among learners. (www.nade.net)

Boylan (2002) defined developmental education as "courses or services provided for the purpose of helping underprepared college students attain their academic goals" with the term "underprepared" referring to both cognitive and affective abilities. Clearly, developmental educators characterize themselves as intervening both cognitively and affectively with students.

Developmental educators claim that the field began in American higher education institutions as early as the 17th century with tutoring at Harvard (cf. Arendale, 2002b). By 1879, 50% of Harvard's students were admitted "on condition" due to poor performance on entrance exams in written composition, so Harvard began offering extra preparation to help these students perform at college level (Weidner, 1990). Casazza (1999) noted that today, the United States provides open access to all citizens interested in higher education by providing various types of developmental education. Financial considerations aside, this statement is generally true for community colleges.

However, this practice of offering developmental education for insufficiently prepared college students has not ever been, and is not now, without controversy. Former NADE President Dan Garnett (1997) described the challenge for developmental education as seven summits to be climbed. These included misperceptions that developmental education is remediation, the idea that taxpayers are "paying twice" for the same remediation, the misconception that remediation does not work, the reauthorization of higher education legislation (the availability of financial assistance for students who need developmental education), state-level legislative opposition to developmental education, negative attitudes of entering college students, and the lack of respect for developmental education. These challenges persist today. For example, developmental education is frequently perceived as a nationwide drain on higher education resources. However, in 2003, only 1% of the national education budget and 4% of federal student financial aid actually went toward remediation (McCabe, 2003), whereas today, only 2% of the total higher education budget is spent on developmental education for nearly 2,000,000 underprepared students (NADE Political Advocacy Brochure, 2011).

Although developmental education has sometimes been characterized as a duplication of services, it is important to realize that even though only 54% of high school students nationwide are enrolled in college preparatory courses, 62% of high school graduates enroll in college (NADE Political Advocacy Brochure, 2011). Many of the students who begin college with remedial courses never intended to enroll at all. McGrath (2001) noted in a much-quoted *Time* magazine article that the number of high school graduates attending college had risen from 49% to 63% over a 20-year period.

College-going populations now include more minorities, first-generation college students, students who work to pay for their education, and students who lack the math, reading, and writing skills needed to succeed at the college level. Of course, the economy is also part of the problem. Many new college students have been the victims of downsizing at their workplaces without the skills to compete for new jobs, or they have graduated from high school only to discover that the job market has dried up. They have experienced a difficult statistic firsthand: 85% of today's workforce will need some postsecondary education (Cain, 2011)—up from 80% at the close of the 20th century (McCabe and Day, 1998).

Nationwide, studies have corresponded on enrollment numbers for developmental education, with the National Education Longitudinal Study (1988-2000) placing the percentage close to 58% (National Center for Education Statistics, 2010), and the Achieving the Dream database (2005) reporting that about 59% of students enroll in at least one developmental education course. Gonzalez (2010) also placed the number at up to 60% of community college students. Unfortunately, not all students complete developmental education or earn a college degree, but those students who succeed go on to complete college-level courses and graduate at a rate similar to students who entered college ready to sign up for college-level English and math (Boylan, 1999). NADE (2011) has reported that 75% of students pass their developmental education courses.

One facet of the National Study of Community College Education looked at individuals who had successfully completed at least the developmental education component of college. Of these students, 98.5% were employed in 2000, nine years after remediation. These successful students worked in a variety of occupations: 15.74% in

the professional sector, 53.74% in mid-level white-collar technical jobs, 19.75% in high-skill blue-collar jobs, and 9.27% in unskilled jobs. Only 1.5% were unemployed, and only 1.5% had committed a felony in the 9 years after remediation. In contrast, in a cohort with the same demographic make-up, 7-8% of the individuals were unemployed, with approximately 8% having been convicted of a felony (McCabe, 2000). (McCabe's study has not been replicated, so comparable current employment figures are not available.)

A number of studies, many of them ex post facto and longitudinal, have examined the outcomes of developmental education related to completion and to subject-area mastery. Many of these studies have compared developmental students with non-developmental students. Some have distinguished between developmental students in community colleges and those in four-year colleges and universities, but many have not. The classic study of developmental education is the Exxon study, conducted between 1990 and 1996 by the National Center for Developmental Education; the study was replicated in 2004 using only community college data (Gerlaugh, Thompson, Boylan, and Davis, 2007.) Currently, the Lumina Achieving the Dream colleges are yielding important information about developmental education. Zachry (2008) detailed some results in a case study of three such colleges.

Of those studies focusing on subject-area mastery, Moss and Yeaton (2006) followed a cohort of entering freshman for six years and compared the English performance of those who needed developmental education with those who did not. Crews and Aragon (2004) studied the short- and long-term effects upon academic performance of students who completed a developmental writing course by looking at

their grades in English composition and their overall grade point averages. Campbell and Blakey (1996) examined whether early remediation affected students' persistence and performance in college.

A second major area of scholarly research has been the definition of best practices in developmental education program design and the documentation of a variety of effective and innovative developmental education initiatives and model programs. A classic in this mode is a year-long case study of the Community College of Denver's developmental education program (Roueche, Roueche, and Ely, 2001). Roueche and Roueche (1999) also examined a range of developmental programs to summarize problems and recommend strategies to solve those problems, and Boylan (2002) recommended research-based administrative practices, program components, and instructional practices. McCabe (2003) examined the field of developmental education and studied 25 effective programs and practices; he also studied trends and made recommendations for community college developmental education policies and practices (2000). McCabe and Day (1998) studied developmental education issues and 10 exemplary developmental education programs, as well. Kull (1999) surveyed higher education institutions to gather descriptive data about developmental education programs and particularly mathematics instruction.

Large funded studies of developmental education and developmental education success initiatives in the United States in recent years include Achieving the Dream, a variety of research-based initiatives piloted by individual colleges (www.achievingthedream.org); the associated research to identify effective developmental programs at The Developmental Education Initiative

(www.deionline.org); the college-completion focused Complete College American (www.completecollege.org); the Carnegie Foundation for the Advancement of Teaching's various math pathways (www.carnegiefoundation.org); the policy-reform oriented Getting Past Go (www.gettingpastgo.org); and the National Center for Academic Transformation's math emporium models (www.thencat.org), among others. Across the United States, various public community college systems are participating in these initiatives and developing their own.

The examination of student perspectives is a fairly recent theme in the literature of developmental education, with most researchers choosing to perform mixed methods or qualitative studies with a specialized group of students. While students are frequently surveyed, however, faculty members are not. The West Virginia Community and Technical College System (WVCTCS) is one of several systems struggling to redefine developmental education instruction in a way that facilitates student success. In 2011, Chancellor James Skidmore formed a Developmental Education Task Force for this purpose, consisting of administrators and faculty members from all 10 community and technical colleges (CTC's) in the system. The state secured a Complete College America grant in fall 2011 for the purpose of faculty development, and the state is in the process of re-visioning developmental education, with a focus on methods of acceleration so that students can complete developmental education more quickly (personal communication, August 25, 2011).

Even in this venue, with developmental education change mandated as a priority, best instructional practice recommendations for developmental education have been minimized in contrast to program design-type innovations. The examination of existing

faculty perspectives regarding best instructional practices in a community college system where developmental education is at the forefront is long overdue.

Problem Statement

The growing body of research on developmental education has not focused sufficiently on the instructional practices that work best with developmental education students. Even though some developmental education best practices include preferred teaching practices, faculty members' perspectives as to whether these particular methods work have been overlooked. This study examined the perspectives of practitioners in a particular public community college system, the WVCTCS, as to what instructional practices are most effective in the field of developmental education.

Research Questions

1. What are the perceptions of developmental education faculty members concerning the effectiveness of instructional practices identified in the literature as best practices for student success in developmental education?
2. What are the perceptions of developmental education faculty members concerning their frequency of use of instructional practices identified in the literature as best practices for student success in developmental education?
3. What is the relationship, if any, between developmental education faculty perceptions of effectiveness and self-reported frequency of use of instructional practices identified in the literature as best practices for student success in developmental education?
4. Is there a difference in developmental education faculty members' perception of effectiveness of instructional practices identified in the literature as best practices for

student success in developmental education related to a faculty member's subject area taught?

5. Is there a difference in developmental education faculty members' frequency of use of instructional practices identified in the literature as best practices for student success in developmental education related to a faculty member's subject area taught?
6. Is there a difference in developmental education faculty members' perceptions of effectiveness of instructional practices identified in the literature as best practices for student success in developmental education related to selected faculty demographics?
7. Is there a difference in developmental education faculty members' frequency of use of instructional practices identified in the literature as best practices for student success in developmental education related to selected faculty demographics?

Purpose of the Study

The purpose of this study was to determine developmental educators' perceptions of the importance of the instructional practices that have been identified as effective for developmental education. It analyzed whether such perceptions are widely held and actually applied in the classroom setting and whether there is any relationship between their use and particular demographic characteristics of faculty members. The information gained from this study can lead to improved teaching practices in the field, to related improvements in course and program design, and thus to increased student success in developmental education, increased success in subsequent courses, increased student retention, and increased graduation rates. The survey instrument developed (Appendix A) provides a method for individual faculty members, developmental education departments, and institutions to assess their own teaching practices against identified best

practices and design professional development to address identified needs. Ultimately, success in developmental education is a matter of the personal success of individuals, families, and communities, and of economic success for the nation as a whole.

Significance of the Study

Little research has focused on faculty members' perceptions of best practices in developmental education instruction. For particular instructional practices that emerged as critically important for faculty members, practitioners will be able to use study results to improve their own teaching practices, and administrators will be able to build these practices into course and program design, thus improving student success in developmental education, success in subsequent college courses, retention in college, and degree completion. Successful developmental education results in a better-educated citizenry and a larger taxpaying workforce. Further, the survey itself may be used to design faculty development programs and enhance existing ones.

Operational Definitions

Developmental education derives its name from its basis upon "the principles and theories of adult development and learning" (Boylan and Bonham, 2007). As such, it includes but is distinct from *remediation*, pre-college level coursework that remedies deficiencies in content-area knowledge and skills required before college students attempt college-level coursework. *Developmental education* in the broadest sense addresses the cognitive, affective, and social needs of students who need further preparation before beginning college-level coursework. It includes instruction in content areas such as math, writing, and reading; instruction in learning skills and metacognition; and associated

student support services such as tutoring, mentoring, academic support labs, and supplemental instruction.

Instructional practices are teaching practices, often called pedagogical practices. However, with the recent distinction between *andragogy*, adult teaching and learning practices, as opposed to the more traditional term *pedagogy*, child teaching and learning practices, using the term *instructional practices* rather than pedagogical practices broadens the term to include the field of andragogy.

Methods

The researcher designed and administered to developmental education faculty members a quantitative survey (with a qualitative component) based upon recommended developmental education instructional practices previously identified in the literature. The survey asked faculty members first to rate the effectiveness of various teaching practices and then to indicate the frequency of use of each teaching method in their classes. Effectiveness responses were scored on a simple 6-point Likert scale, ranging from a score of 1 as "not at all effective" to a score of 6 as "very effective." The scale for usage of frequency of practice was also a 6-point Likert scale, with a score of 1 designated as "not used at all" and a score of 6 designated as "used very frequently."

The survey questions were derived from recommended instructional techniques for developmental education as identified by Boylan (2002); Smittle (2003); Simpson, Stahl, and Francis (2004); the Massachusetts Community Colleges Executive Office (2006) and Sperling, 2009); and the California Community College Basic Skills Initiative (Boroch et al., 2010). Those items with a majority of ratings above mid-scale (5 or 6) were designated as critically important.

Independent variables were selected faculty demographic characteristics, including sex, age, ethnicity, and number of years teaching in a particular setting. Dependent variables included perceptions of importance and frequency of practice for the specified instructional techniques.

The population for the study was the developmental education faculty (teaching developmental reading, writing, math, affective or student success skills, and ESL-focused versions of these subject areas). The survey population consisted of all full-time faculty members and administrators in each public community and technical college in the West Virginia Community and Technical College System who teach developmental education. The faculty members in the survey population had to teach developmental education regularly; that is, at least one class per academic year. The entire survey population of 77 faculty members was surveyed.

The survey invitation was distributed by email with an embedded link to an electronically-delivered survey at Survey Monkey. Survey results were tabulated and examined by the researcher to determine whether faculty members perceived the recommended instructional practices for developmental education to be effective and to be used frequently. The researcher also examined relationships among preferred teaching techniques and various demographic characteristics of the populations surveyed in order to demonstrate whether developmental education's best teaching practices are widely embraced or related to particular faculty demographic characteristics.

A pilot study of the survey instrument was conducted at the 2011 Kellogg Institute for the Training and Certification of Developmental Educators at the National Center of Developmental Education at Appalachian State University in Boone, North

Carolina. Instructors and class members were invited to complete anonymously a paper copy of the survey. The investigator then conducted two focus groups and met individually with experts in developmental education, as well as in teaching and learning, to further refine survey questions. Appendix B contains the pilot study procedures and results.

Limitations of the Study

The study examined the perceptions of a limited population of participants. It did not address the perspectives of students; teaching support services professionals such as tutors, supplemental instructors, mentors, or counselors; or faculty members in four-year institutions who teach developmental education, adjunct or part-time faculty members, or faculty members outside the WVCTCS area. The study used primarily a quantitative survey in order to provide a broad range of data; this choice consequently restricted the depth of the study as far as individual faculty perspectives. As with any survey, even an anonymous survey, truthfulness of participants was a potential limitation, and a social desirability factor may have lent bias to answers, particularly in the usage category of the survey; that is, once participants rated a particular practice as important, they would have been more likely to report that they use it frequently.

In addition, the study did not examine separately particular instructional practices used in online instruction or those associated primarily with andragogy as opposed to pedagogy. The researcher made the assumption, supported by the literature, that all of these instructional practices relate to recommended practices in developmental education instruction.

Summary

Decreased funding and increased demands for accountability have led to an examination of the effectiveness of developmental education. Although recommended instructional practices have been identified by a few researchers, most developmental education studies have focused on nearly every other aspect of the field without considering the instructional practices and perspectives of the professional practitioners. This quantitative study surveyed developmental education faculty members in public community colleges in the WVCTCS in order to determine these faculty perspectives in a state where developmental education was being reexamined. Survey questions focused on effective teaching practices in developmental education and on selected demographic characteristics.

The information gained from this study concerns improved instructional practices in the field and related improvements in course and program design, and thus, is associated with increased student success in developmental education, increased success in subsequent courses, increased student retention, and increased graduation rates. The survey instrument developed provides a method for individual faculty members, developmental education departments, and institutions to assess their own instructional practices against identified recommended practices and design professional development to address perceived needs. Ultimately, success in developmental education is a matter of the personal success of individuals, families, and communities, and of economic success for the nation as a whole.

CHAPTER TWO: REVIEW OF THE LITERATURE

Developmental education derives its name from its basis upon "the principles and theories of adult development and learning" (Boylan and Bonham, 2007). As such, it includes but is distinct from *remediation*, pre-college level coursework that remedies deficiencies in content-area knowledge and skills required before college students attempt college-level coursework. *Developmental education* in the broadest sense addresses the cognitive, affective, and social needs of students who need further preparation before beginning college-level coursework. It includes instruction in content areas such as math, writing, and reading; instruction in learning skills and metacognition; and associated student support services such as tutoring, mentoring, academic support labs, and supplemental instruction.

Broad areas of research in developmental education research include the establishment of developmental education as a field of study, best practices in program design, developmental education and the community college, college completion and acceleration innovations, student perspectives, and adult learning theory. These areas inform the focus of this study on faculty perceptions of recommendations for developmental education instruction.

Developmental Education as a Field

Defining developmental education, justifying its existence, and demonstrating its success has been one major thrust of research over the past thirty years. The National Association for Developmental Education (NADE) has defined developmental education on its website as follows:

> Developmental education is a field of practice and research within higher education with a theoretical foundation in developmental psychology and learning theory. It promotes the cognitive and affective growth of all postsecondary learners, at all levels of the learning continuum. Developmental education is sensitive and responsive to individual differences and special needs among learners. Developmental education programs and services commonly address academic preparedness, diagnostic assessment and placement, development of general and discipline-specific learning strategies, and affective barriers to learning. Developmental education includes, but is not limited to:
>
> - all forms of learning assistance, such as tutoring, mentoring, and supplemental instruction,
> - personal, academic, and career counseling,
> - academic advisement, and
> - coursework. (http://www.nade.net/AboutDevEd.html)

This definition emphasizes the developmental education focus on students' growth, not only in mastery of isolated subject areas, but also in the development of learning skills and behaviors.

In a Kellogg Institute presentation and associated notes, H.R. Boylan, Director of the National Center for Developmental Education (NCDE) (personal communication, June 27, 2011) discussed a number of developmental education principles that clarify the nature of developmental education. These include the following guidelines:

> Accept students where they are and move them as far as they can go.
>
> Assume that all students have the potential for growth.

Facilitate the transfer of knowledge to new learning situations.

Increase cognitive self-awareness.

Encourage students to gradually accept responsibility for their own learning.

Recognize that learning also includes affective development.

Envision all students as potential graduates.

Developmental education is much more than subject area remediation, and Boylan has underlined this point with the inclusion of principles related to metacognitive skill development and the focus on affective areas such as motivation.

Boylan (2002) himself has broadly defined developmental education as "courses or services provided for the purpose of helping underprepared college students attain their academic goals," with the term "underprepared" referencing "any students who need to develop their cognitive or affective abilities in order to succeed in a postsecondary educational experience" (p. 3).

Developmental education professionals have worked to define and organize the field of developmental education for several decades. The scholarly study of developmental education (not simply remediation) is a relatively new area, beginning in the 1960s and 1970s with a few studies but mostly gaining prominence in the latter decades of the 20th century. According to its website, the College Reading and Learning Association (CRLA), originally called the Western College Reading Association, founded in 1966, is usually acknowledged as the first national developmental education organization. The organization held conferences and published conference proceedings and later, starting in 1983, the *Journal of College Reading and Learning* (CRLA, 2011). It established its own policy statements, awards, and tutor program certification.

According to the NADE Fact Sheet (2011), NADE was founded in 1976 as the National Association for Remedial/Developmental Studies in Postsecondary Education. The organization hosted conferences and began forming state and regional chapters and honoring outstanding educators and programs with annual awards. The *Journal of Developmental Education* (published by the National Center of Developmental Education) was adopted as its official journal in 1983, and NADE inaugurated its own journal, the *NADE Digest*, in 2005 (Boylan, 2011a).

Clark-Thayer (2009) noted that NADE published program *Self-Evaluation Guides* in 1995 and established a NADE Certification Council, in response to and based partly upon the 1989 Council for Advancement of Standards in Higher Education (CAS) standards for learning assistance programs. The most recent edition of the *Self-Evaluation Guides* (2009) is also based upon best practices articulated in Boylan's *What Works* (2002). Because the CAS standards were developed with minimal input of the two national developmental organizations in existence at the time, NADE and CRLA, the NADE Professional Standards and Evaluation Committee wrote its own evaluation standards modeled upon those of CAS but focusing "more directly on programs found in the field" (Clark-Thayer, p. viii). These guidelines now include standards for four distinct areas of certification: Teaching and Learning, Developmental Coursework, Tutoring, and Course-Based Learning (Clark-Thayer & Cole, 2009).

The National Center for Developmental Education at Appalachian State University (NCDE) was founded in 1976 with a grant from the W. K. Kellogg Foundation (Boylan & Bonham, 2007). NCDE publishes the *Journal of Developmental Education* and *Research in Developmental Education*, conducts research studies, serves

as a developmental education resource, and sponsors the annual Kellogg Institute for the Training and Certification of Developmental Educators.

Along with NADE and the NCDE, CRLA became a founding member of the American Council of Developmental Education Associations in 1996, now the Council of Learning Assistance and Developmental Education Associations, "a group of student-oriented professionals active in the fields of reading, learning assistance, developmental education, tutoring, and mentoring at the college/adult level" (Boylan, 2001).

Clark-Thayer (2009) explained the steps that members of professional organizations follow to establish a professional field of study:

> One of the distinguishing characteristics of a profession is a set of self-governing standards that establishes a degree of excellence to which members should aspire. These standards are often collectively referred to as "best practice" for that profession. Best practices are elements that research and practice have shown to be present in every quality program. Established professions have journals, active research, standards, and organizations with conferences at which colleagues gather to share information about best practice. The presence of this body of information helps establish the credibility and guide the success of a profession. (p. vii)

Both CRLA and NADE, as well as the NCDE, have worked through these steps in the past few decades, establishing developmental education as a respected field of higher education.

However, remediation itself began in American higher education institutions with their own genesis in the 17th century with tutoring services (Arendale, 2002b). By 1879,

50% of Harvard's students were admitted "on condition" due to poor performance on entrance exams in written composition, so Harvard began offering extra preparation to help these students perform at college level (Weidner, 1990). Arendale (2002a) reports that in 1894, 40% of first-time college students nationwide were enrolled in "pre-collegiate" courses (statistic originally cited in Levine, 1978).

This type of statistic was frequently cited in the latter decades of the 20th century, when a large part of developmental education research sought to justify the existence of the field itself amidst discussions by various state and national policy-makers of the possibility of eliminating developmental education. As Arendale (2002a) pointed out, many higher education historians have also ignored or minimized the role of developmental, remedial, learning assistance, and/or college preparatory programs in the history of American education. Arendale noted that most references to developmental education in higher education histories, texts that "averaged 400 pages," were limited to "passages of several sentences to several paragraphs," and many higher education histories failed to mention developmental education at all (p. 8).

In fact, the first National Center for Education Statistics (NCES) report on developmental education was not published until 1984 (Boylan & Bonham, 2007). As Boylan and Bonham pointed out, other reports were published in 1990, 1996, and 2003, and developmental education data are now regularly included in the U.S. Department of Education's annual report, "The Condition of Education." According to the 2011 report, in 2007-2008, 41.9% of students at two-year public institutions and 38.6% of students at public non-doctoral four-year institutions took remedial courses.

However, this practice of offering developmental education for insufficiently prepared college students has always been controversial, and it continues to be so. With the national focus on assessment and accountability that grew prominent in the latter decades of the 20th century, developmental education has often been examined in terms of both effectiveness and cost-effectiveness. For a number of years, legislators and other stakeholders have questioned the idea of "paying twice" (Garnett, 1997) for education, once in a student's secondary school career and then again as remediation in college. With the world economic troubles that snowballed in the 21st century, this question has remained in the forefront of public policy issues.

A major focus of study in developmental education has thus been the demonstration of both the effectiveness and the cost-effectiveness of developmental education, examining both higher education expenditures and various alternative measures of success for students who participate in developmental education. Boylan (2002), listed several major studies of developmental education performed by the NCDE:

- The National Study of Developmental Education carried out from 1989 through 1996 under a grant from the Exxon Education Foundation,
- The study of minority retention in developmental education undertaken from 1995-1997 under a grant from the Alfred P. Sloan Foundation,
- Two statewide studies of the Texas Academic Skills Program and developmental education in Texas colleges and universities carried out in 1995-96 and 1998 under a grant from the Texas Higher Education Coordinating Board,

- A series of literature reviews on best practices in developmental education carried out in 1998-99 under a grant from the League for Innovation, and
- A variety of other research studies conducted under contract to state and federal higher education agencies. (p. 2)

The National Benchmarking Study of Developmental Education in 1999-2000, sponsored by the Continuous Quality Improvement Network (CQIN) in partnership with the nonprofit American Productivity and Quality Center (APQC), led by NCDE Director Boylan and rooted in these earlier studies, resulted in the classic summary of developmental education principles, *What Works* (Boylan, 2002). CQIN is an association of two-year institutions, four-year institutions, nonprofits, and corporations dedicated to the sharing of innovative ideas and best practices (CQIN, 2011; Boylan, 2002).

The CQIN/APQC study involved two phases. First, best practice institutions were selected through primary and secondary research using the criterion of "strong reputations for delivering developmental education successfully" (Boylan, 2002, p. 4). The list was narrowed down from 60 to 5 exemplary institutions based upon willingness to participate and survey data. Next, the study team performed thorough case studies on each of the five institutions. Data were originally reported at a conference in 2000, and then published in a joint CQIN/NCDE effort as *What Works* (Boylan, 2002).

The NCDE performed a follow-up study to the 1990-1996 NCDE "Exxon Study" in 2004-2005, using community college enrollment data from 2001-2003 from 45 institutions (Gerlaugh, Thompson, Boylan, and Davis, 2007). Like the earlier study, this study examined demographics and performance statistics of students, along with the

"program components, services, and instructional techniques to which these students had been exposed" (p. 1).

In examining the cost-effectiveness of developmental education, in 2003, McCabe stated that only 1% of the national education budget and 4% of federal student financial aid actually went toward remediation; many others have updated these statistics over the intervening years, and NADE now includes such statistics in its political advocacy materials. According to NADE, in 2011, only 2% of the total higher education budget was spent on developmental education for nearly 2,000,000 underprepared students (NADE Political Advocacy Brochure, 2011).

Various studies have also continued to examine the idea of duplication of services, and NADE has highlighted this statistic as part of its political advocacy efforts, pointing out that even though only 54% of high school students nationwide are enrolled in college preparatory courses, 62% of high school graduates enroll in college (NADE Political Advocacy Brochure, 2011). This emphasis also provides another type of support for the idea that remediation is the wrong term for developmental education, when many students who begin college with "remedial" courses had never enrolled in courses such as college-preparatory mathematics and writing in high school, and in fact, had never intended to pursue a college education at all. In an associated statistic, developmental education researchers and advocates also emphasize that many new college students have already experienced a difficult statistic firsthand: 85% of today's workforce will need some postsecondary education (Cain, 2011)—up from 80% at the close of the 20th century (McCabe and Day, 1998).

Over the years, a number of effectiveness-related studies, many of them ex post facto and longitudinal and some of them nationwide, have examined the outcomes of developmental education related to completion and to subject-area mastery. Many of these studies have compared developmental students with non-developmental students. Some have distinguished between developmental students in community colleges and those in four-year colleges and universities. These studies have also tracked enrollment numbers for developmental education and successful completion of next college-level courses.

The National Education Longitudinal Study (1988-2000) placed the enrollment percentage of college students in developmental education at close to 58% (National Center for Education Statistics, 2010), more recently, Developmental Education Initiative (Developmental Education Initiative, 2011) reports that about 60% of community college students enroll in at least one developmental education course. These numbers have been studied repeatedly over the years and tend to remain very consistent.

As far as success statistics in developmental education, NADE (2011) has reported that 75% of students pass their developmental education courses. (Other estimates place the number much lower.) The classic study for developmental education is the Exxon study, conducted between 1990 and 1996 by the NCDE and replicated in 2004 using only community college data (Gerlaugh, Thompson, Boylan, and Davis, 2007.) The community college data (which calculated results using only students on the roster at the end of the semester, not including students who withdrew) reflected a success rate of 72% of students earning a grade of *C* or above. In contrast, Bailey's (2008) study of developmental education in community colleges using longitudinal

datasets finds that "on average, developmental education as it is now practiced is not very effective in overcoming academic weaknesses, partly because the majority of students referred to developmental education do not finish the sequences to which they are referred" (p. 1) but finds merit in the current experimentation with new approaches.

Of those studies focusing on subject-area mastery, Moss and Yeaton (2006) followed a cohort of entering freshman for six years and compared the English performance of those who needed developmental education with those who did not. Crews and Aragon (2004) studied the short- and long-term effects upon academic performance of students who completed a developmental writing course by looking at their grades in English composition and their overall grade point averages. Campbell and Blakey (1996) examined whether early remediation affected students' persistence and performance in college. Boylan (1999) claimed that those students who succeed in developmental education go on to complete college-level courses and graduate at a rate similar to students who enter college ready to sign up for college-level English and math; Bahr (2010) agreed. A more recent study by Attelwell, Lavin, Domina, and Levey (2006) concurred that developmental education is not associated with lack of success in community college students, although the results may be negative with four-year college students.

Bailey, Jeong, and Cho (2010) noted that a major factor in completion of developmental education is the number of exit points in developmental education sequences. This major study of student progression through levels of developmental education beginning at initial referral concluded that fewer than half the students referred to developmental education complete their assigned sequence with about 30% failing to

enroll in any developmental course at all and only 60% enrolling in the prescribed course. In addition, failure to complete developmental education is more often directly related to the exit points where students fail to enroll in the first or a subsequent course, as opposed to students' failure or withdrawal from a course.

Another measure of developmental education success research has been employment. One facet of the National Study of Community College Education looked at individuals who had successfully completed at least the developmental education component of college. Of these students, 98.5% were employed in 2000, nine years after remediation. These successful students worked in a variety of occupations: 15.74% in the professional sector, 53.74% in midlevel white-collar technical jobs, 19.75% in high-skill blue-collar jobs, and 9.27% in unskilled jobs. Only 1.5% were unemployed, and only 1.5% had committed a felony in the nine years after remediation. In contrast, in a cohort with the same demographic make-up, 7-8% of the individuals were unemployed, with approximately 8% having been convicted of a felony (McCabe, 2000). McCabe's study has not been replicated, so comparable current employment figures are not available. However, Prince and Jenkins (2005) reviewed database information in the Washington State Board of Community and Technical College to track the educational progress of students in that system; they found that "attending college for at least one year and earning a credential provides a substantial boost in earnings" for the students in the study" (p. 21).

Best Practices in Program Design

A second major area of scholarly research has been the definition of best practices in developmental education program design and the documentation of a variety of

effective and innovative developmental education initiatives and model programs. A classic in this mode is a year-long case study of the Community College of Denver's developmental education program (Roueche, Roueche, and Ely, 2001). The Roueches also examined a range of developmental programs to summarize problems and recommend strategies to solve those problems (1999).

As a result of the CQIN/APQC study, Boylan (2002) recommended research-based best practices in three areas: organizational, administrative, and institutional practices; program components; and instructional practices. The best practices, recently supplemented with action steps for administrators (Boylan and Saxon, 2012), are now considered the classic in the field. Boylan (2002) required each best practice to meet the following criteria in order to be included: 1.) citation in several research studies of "effective developmental education," 2.) citation over a period of time, 3.) successful replication at several higher education institutions, 4.) consideration "by expert professionals participating in the study as important for developmental education," and 5.) rigorous documentation of effectiveness (p. 6).

McCabe (2003) examined the field of developmental education and studied 25 effective programs and practices; he also studied trends and made recommendations for community college developmental education policies and practices (2000). McCabe and Day studied developmental education issues and 10 exemplary developmental education programs, as well (1998). Kull surveyed higher education institutions to gather descriptive data about developmental education programs and particularly mathematics instruction (1999).

Perin (2002) compared centralized v. decentralized developmental education programs. Boroch et al (2010) examined effective practices in developmental organization and administration. Levin (2007) discussed the need for community colleges to evaluate developmental education programs and make changes with a more evidence-based focus, to "carry out formal evaluations of different remedial approaches to test their efficacy and cost-effectiveness in order to pursue a wise remediation strategy" (p. 21).

Developmental Education and Community Colleges

As noted in Boroch et al. (2010), many community colleges are open-access institutions, with no minimum placement score required for admission. Thus, community colleges emphasize developmental education as an important part of their mission, and community colleges in particular offer coursework as well as a variety of associated student services in order to prepare students to succeed in college. In recent years, the trend has been to emphasize the close relationship between community colleges and developmental education; not surprisingly, the NCDE chose to focus on community colleges only when updating the Exxon study in 2004 (Gerlaugh et al., 2007).

Much recent research has focused exclusively on developmental education in the context of community colleges. Perin's (2002) study of centralized v. mainstreamed developmental education programs, for example, concentrated entirely on community colleges. Boroch et al. (2010) examined developmental education effective practices in organization and administration, instruction, student support service, and professional development entirely in the context of community colleges. Naturally, the Massachusetts Community College System (Massachusetts Community College Executive Office, 2006;

Sperling, 2009) and Connecticut Community Colleges (Schwartz & Jenkins, 2007) developmental education studies also did the same.

Large-scale reform efforts such as Achieving the Dream, Developmental Education Initiative, the Carnegie Foundation for the Advancement of Teaching's Pathways project, and Getting Past Go have also focused on developmental education as primarily the purview of community colleges. Bailey and Cho (2010) survey evidence about the effectiveness of developmental education in community colleges and the progression of students through developmental sequences.

College Completion and Acceleration Innovations

Large funded studies of developmental education and developmental education success initiatives in the United States in recent years have focused on college completion and innovations to accelerate developmental education to make completion possible. Perhaps the first large-scale effort, Achieving the Dream (ATD) is a national nonprofit that is "dedicated to helping more community college students, particularly low-income students and students of color, stay in school and earn a college certificate or degree" (Achieving the Dream Community Colleges Count, 2011). Achieving the Dream funds a variety of research-based initiatives originally piloted by individual colleges and now being "scaled up" to serve more students. Zachry (2008) detailed some promising results in a case study of three such colleges. In the first extensive study of the Achieving the Dream colleges, Rutschow et al (2011) described only minor changes in the number of students completing developmental education courses successfully, with a few notable exceptions; however, it is possible that greater success may arise with on-going efforts to "scale up" the initiatives to reach a greater number of students. The Developmental

Education Initiative (DEI) is a group of Achieving the Dream community colleges working to bring successful innovations to scale (Developmental Education Initiative, 2011).

The Carnegie Foundation for the Advancement of Teaching's various math pathways are an intriguing developmental success and acceleration method that are still partially in the pilot phase. The organization's stated aims have been to increase community college students' success in developmental math by doubling the number of students "who in a one-year course sequence are mathematically prepared to succeed in further academic study" (Carnegie Foundation, 2011). The acceleration model has classified college mathematics sequences into three pathways related to programs of study: Statway for students who need a college-level statistics course, Quantway for students who need a mathematical reasoning-type course, (Carnegie Foundation, 2011) and STEMway for students moving into science, technology, engineering, and math careers (Uri Treisman, personal conversation, 2011). The one-year pathways allow students to progress from developmental math through the college-level course in a single academic year. Asera (2011) and Merseth (2011) have described recent progress in this initiative.

The National Center for Academic Transformation (NCAT) also focuses on reforming higher education; its popular program known as the emporium model has received most of its initial attention in the context of developmental math. The organization states that it is "an independent, not-for-profit organization that provides leadership in using information technology to redesign learning environments to produce better learning outcomes for students at a reduced cost to the institution" (NCAT, 2011).

According to Twigg (2011), the successful components of the emporium model are interactive computer software, personalized on-demand assistance, and mandatory student participation.

Complete College America is another non-profit founded in 2009 and dedicated to a similar goal of working with individual states to increase the number of graduates with college certificates and degrees and "to close attainment gaps for traditionally underrepresented populations" (Complete College America, 2011a). Complete College America (2011b) has cited statistics that 50.1% of associate degree students and 20.7% of bachelor degree students require remediation, while remedial students are much less likely to graduate. The organization describes developmental education as "the Bermuda triangle of higher education," noting, "Most students are lost, and few will ever see graduation day" (p. 14).

Like Achieving the Dream, Complete College America does not advocate a prescriptive method of developmental education reform; instead, the organization encompasses a variety of methods that may all lead to the same outcome. Various recommended acceleration initiatives include Peter Adams' Acceleration Learning Program (Jenkins et al, 2010), the Carnegie Pathways, the NCAT emporium model, and various types of paired and blended courses such as those advocated by Hern and Snell (2010) (Stan Jones, personal conversation, 2011). Perin (2011) has provided an overview of the mechanics and effectiveness of contextualization, which advocates teaching basic skills such as writing or reading in the context of a particular discipline area such as history, for example.

The organization's recommendations for reinventing developmental education (Complete College America, 2011b), include the following:

1. Divert students from traditional remedial programs.
2. Mainstream as many students as possible into college-level courses with co-requisite and embedded support for those needing extra help.
3. Intensify instruction and minimize the time necessary to prepare students for entry into college-level courses.
4. Eliminate the many exit points where students are lost by either not passing or not enrolling in courses.
5. Provide alternative pathways to a career certificate or career-related credential for students with major academic weaknesses.
6. Answer the fundamental question — is what's being taught in developmental education what students really need?
7. Overhaul the current placement system.

Among the major developmental education reform efforts, Getting Past Go, sponsored partly by the Education Commission of the States, focuses exclusively on policy research and reform. The group has described its mission in this way: "The national initiative will help education policy leaders align state and system policy to increase the college success of the large percentage of students enrolled in postsecondary education who require remedial and developmental education" (Getting Past Go, 2011).

Another major education initiative related to developmental education is Complete to Compete, a project of the National Governors Association. The project's stated goal is to "improve higher education performance and identify promising state

policies as a first step to retaining excellence and regaining access in higher education" (National Governors Association, 2011). The organization has pointed out the oft-cited statistic that "in the knowledge-based economy of today," over two-thirds of jobs will require some type of college education. Although the pathway to the middle class now runs through college, higher education institutions are not graduating enough citizens to meet current (or projected) workforce needs. Complete College America has defined new completion "metrics" that include graduation data not found currently in the Integrated Postsecondary Education Data System (IPEDS), including information on part-time and transfer students and the disaggregation of low-income and remedial students (Reyna, 2010).

Boylan's (2009) proposed Targeted Interventions for Developmental Education Students (T.I.D.E.S.) approach to completion is another initiative that "deliberately attempts to reduce the number of students taking developmental courses by placing as many students as possible directly into college-level courses with appropriate learning assistance and support services" (p. 18). This model focuses on assessing and placing developmental education students using a combination of cognitive, affective, and personal assessments that fit into a profile of their abilities and needs; interventions including courses, learning assistance, and services are targeted for each specific student profile. Implementing the model would involve the following steps: inventory courses and services; develop profiles; assess students; advise students; deliver intervention; monitor and evaluate; and revise (p. 16).

In related studies, Saxon, Levine-Brown, and Boylan (2008) examined various affective assessments involving "student learning strategies, attitudes, and study skills"

(p. 1) in part one of a research series. In part two of the affective assessment series, Levine-Brown, Bonham, Saxon, and Boylan (2008) reviewed "critical thinking and reasoning skills assessments, learning preferences and styles inventories, readiness and risk inventories, and adult learner surveys" (p. 1).

Although the aims of these and numerous other initiatives are promising, and the programs all advocate course design innovations that incorporate successful instructional practices, few recent studies have actually focused on exemplary instructional techniques. Patrick Henry Community College's Southern Center for Active Learning Excellence, funded initially through the Lumina Foundation and Achieving the Dream and described in Zachry (2008), is, however, an exemplary exception. Edgecombe (2011), who has provided an excellent overview of the models of acceleration and their effects on student outcomes, noted that "focusing primarily on structural reforms diverts attention from pedagogy, a dimension of the education experience that is critical to student success. It also limits recognition of the potential for interaction between structure and pedagogy" (p. 25).

Student v. Faculty Perspectives

The examination of student perspectives is a fairly recent theme in the literature of developmental education with most researchers choosing to perform mixed methods or qualitative studies with a specialized group of students. Some quantitative studies exist, as well. For example, Green (2011) performed a quantitative survey of a random sample of Southern college students enrolled in summer school as to their student perceptions of the effect of developmental education courses on their "academic performance and persistence in college-level coursework." Green found that students "feel they are better

prepared" after developmental coursework and that they remained in college "as a result of completing developmental courses" (p. 3).

However, a literature search reveals little emphasis on faculty perspectives. Saxon and Boylan (2010) have made a point that may be related to the dearth of literature on faculty perspectives: The "overwhelming majority" of developmental education courses now and in the past have been taught by part-time rather than full-time faculty members. The number of "scholar practitioners" in the field who have actually studied the literature and trained in effective techniques is actually quite small (p. 36). In fact, NADE, the largest developmental education professional organization that includes faculty members as well as various student support professionals, boasts only 3,000 members (NADE Fact Sheet, 2011).

Saxon and Boylan (2010) characterized the existing research in the field as "institutional studies, a few large scale studies without control groups; literature reviews; foundation research reports; meta-analyses; and case studies, ethnographic, and other types of qualitative studies" (p. 36.). Although Boylan and Saxon commended the many organizations funding "promising practices," they noted that much "new" research is actually being performed on existing, well-known developmental education initiatives such as Supplemental Instruction, mastery learning, learning communities. Moreover, even though many developmental education professionals have welcomed the new national focus on developmental education, many "long-term professional developmental education researchers and practitioners" feel that they "are being marginalized and dictated to in an effort to find a quick fix to the 'remedial education problem'" (p. 35.)

The Massachusetts Community Colleges Developmental Education Best Policy and Practice Audit is an exception to this perceived trend. Part of the project was a survey of best practices and policies that was administered to chief academic officers, faculty chairs of departments that included developmental reading, writing, and math courses; and coordinators of various college support programs (Sperlng, 2009). This study did examine faculty perspectives; however, Sperling reported that only 74 academic chairs of departments that included developmental education (not chairs of developmental math departments or even faculty members teaching primarily in the field of developmental education) responded to the survey, including about 20% of respondents (fewer than 15 respondents on average) in each of the five categories of chief academic officers; writing department chairs; reading department chairs; and special programs and self-paced studies (p. 54).

Clearly, much more work needs to be done in the field of developmental education in order to determine the faculty's perspective of best practices in the field. As Bonham and Boylan (2011) noted:

> Fortunately, there is a great deal of research to identify promising practices that may improve the quality of developmental mathematics instruction. There are also a number of projects being undertaken to redesign the content and improve the delivery of developmental mathematics courses. For these efforts to be successful it will be necessary for professional associations, foundations, policy makers, and *developmental mathematics instructors* [emphasis added] to collaborate in changing the way developmental mathematics courses are structured, taught, and delivered. (p. 9)

Developmental Education and Adult Learning Theory

As previously noted, the field of developmental education is based upon learning theory. Within this field lies the study of *instructional practices*, or teaching practices, often called pedagogical practices. However, with the recent distinction between *andragogy*, adult teaching and learning practices, as opposed to the more traditional term *pedagogy*, child teaching and learning practices, using the term *instructional practices* rather than pedagogical practices broadens the term to include the field of andragogy.

Merriam, Caffarella, and Baumgartner's *Learning in Adulthood* (2007) and Silverman and Casazza's *Learning & Development* (2000) are arguably two of the most widely-used compendiums of learning theory in the field of developmental education and have both been referenced in the NADE certification training (Clark-Thayer, personal communication, 2011), where one component of the certification process is an articulation of the developmental education program's theoretical framework. Each of these works is a synthesis of adult learning theory related to post-secondary education.

Merriam, Caffarella, and Baumgartner (2007) classified adult learning theory in five categories that they called "orientations to learning": behaviorist, humanist, cognitivist, social cognitive, and constructivist. Each of these categories (summarized in an excellent table on pp. 295-296) was characterized in terms of learning theories, view of the learning process, locus of learning, purpose of learning, the instructor's role, and the manifestation of adult learning.

Merriam, Caffarella, and Baumgartner described the behaviorist view of the purpose of learning as "to produce behavioral change in [the] desired direction" (p. 295); primary theorists include Guthrie, Hall, Pavlov, Skinner, Thorndike, Tolman, and

Watson. The humanist approach, founded upon the work of Maslow and Rogers, views the purpose of learning as "to become self-actualized, mature, [and] autonomous" (p. 295). The cognitive approach purpose of learning is "to develop [the] capacity and skills to learn better" (p. 295). It includes such topics as insight, memory, perception, and metacognition and is based on the work of cognitivist theorists such as Ausubel, Bruner, Gagne, Koffka, Kohler, Lewin, and Piaget. The social cognitive approach as espoused by Bandura and Rotter is that the purpose of learning is "to learn new roles and behaviors" (p. 295). Finally, the constructivist approach as described by Merriam, Caffarella, and Baumgartner is "to construct knowledge" (p. 295). It is based upon the work of Candy, Dewey, Lave, Piaget, Rogoff, von Glaserfeld, and Vygotsky.

Similarly, Silverman and Casazza (2000) discussed development and learning theory within the perspective of improving instructional practice and in the context of six categories: self and identity; motivation; interaction with the environment; ways of knowing; learning styles and preferences; and self-regulation and goal setting. The first three categories are related to theories of personal development and learning, while the final three are related to theories of cognitive development and learning. Like *Learning in Adulthood, Learning & Development* offers a helpful chart that lists theorists in each of the six categories along with the "application to practice" of each (p. 55). Even though this work is somewhat dated as far as references, the categories are still quite relevant, and the tracing of the development of related learning theories is interesting.

Silverman and Casazza's self and identity category of learning theory relates to the idea that, "Learners' views of themselves and the educational settings they experience are often closely connected to learning outcomes" (p. 73). Components of self-identity

include self-esteem, self-efficacy, and self-concept; and primary learning theorists for this category include Treisman, Chickering, Marcia, and Mezirow. Motivation is a second category that encompasses both extrinsic and intrinsic motivation and includes the perspectives of motivation as related to goals; self-perceptions and beliefs; and contextual and cultural factors. Theorists in this category include Bandura; Rotter; Weiner and Covington; Nisbett; Ross; and Maslow. A third learning theory category is interaction with the environment, including both academic and non-academic interaction, as related to the work of Lewin; Kaiser; Moos; McClusky; Canfield and Witkin; and Brookfield.

Silverman and Casazza's "ways of knowing" category includes theories related to cognitive development and types of intelligence; they discussed a variety of theorists here including Vygotsky; Brown, Collins, and Duguid; Bruffee; Mezirow, Cross and Steadman; Gardner; Sternberg; Mayer and Salovey; Tennant and Pogson; Brookfield and Witkin; Shraw and Bruning; Perry; and Magolda. The common principles underlying these theories are that cognitive development occurs in stages; intelligence is not "one generalized factor"; learning is an active, collaborative process; and knowledge is "at the very least partially constructed by the learner" (p. 139). A fifth category is learning styles and preferences, a broad category that examines ways of knowing related to cultural, physiological, personality-based, and instructional preferences. This category is based upon the work of Brookfield; Bruffee; Goldberger, Pai and Adler; Wlodkowski and Ginsberg; Branch-Simpson, Fordham, and Ogbu; Kitchens; Witkin; Myers and Briggs; and Canfield. The final category is self-regulation and goal-setting, encompassing metacognition topics and the discussion of both mastery and performance goals.

Principle theorists include Garner; Weinstein and Mayer; Pintrich, Zimmerman, and Paulsen; Hagen and Weinstein; Cross and Steadman; and Atkinson and Feather.

The special interest of developmental education professionals in adult learning theory is reflected in the professional organizations as well. NADE fosters several Special Professional Interest Networks (SPINs), including a Brain-Compatible Education SPIN led by Rita Smilkstein, Deb Daiek, and Janet Zadina that focuses on "teaching practices based on brain research." Another SPIN, Learning and Study Skills, led by Magdala Ray and Nichole Bennett-Bealer, focuses on "the latest research on learning and study skills" along with "what works" for the educators and students (NADE, 2011). Other NADE SPINs, each seeking to network and to share research and best practices, include Adjuncts; Administration; Advising and Counseling; English/Writing/ESL; Integration of Basic Skills, Learning Disabilities; Mathematics; Online Educators; Peer Assisted Programs; Reading; Science; Technology; TRIO; and Workforce Development.

Likewise, CRLA offers Special Interest Groups (SIGs) to provide networking and allow members to exchange "the leading tools and techniques to enhance student academic success." Two that focus particularly on adult learning theory are Brain Compatible Teaching/Learning, led by Charis Sawyer; and Learning & Study Strategies, led by James Barnes. The Brain Compatible Teaching/Learning SIG publishes a newsletter that shares "current research in reading theory and instruction, reading processes, adult literacy, problem solving, and cognitive models describing how adults learn and remember." The Learning & Study Strategies SIG focuses on "college-level learning and study strategies" (CRLA, 2011). Other CRLA SIGs include College Reading; Developmental/Basic Writing; English Speakers of Other Languages (ESOL);

Graduate & Professional Student Success; Learning Assistance Center Management; Learning Communities; Learning Disabilities; Mathematics; Multicultural Issues; Peer Assistance Programs; Research and Evaluation; and Technology & Distance Learning.

Theoretical Framework of the Study

Although the instructional practices examined in this study certainly relate to broad topics in adult learning theory such as metacognition, self-regulation and self-monitoring, andragogy, active learning, social or collaborative learning, and other areas related to student learning, the focus of this study is on the examination of recommended practices in instruction specifically identified for developmental education. Studies by Boylan (2002); Smittle (2003); Simpson, Stahl, and Francis (2004); the Massachusetts Community Colleges Executive Office (2006), and Sperling (2009); and the California Community College Basic Skills Initiative (Boroch et al, 2010) articulate the recommendations for developmental education instruction that provide the main framework for this study.

Boylan's *What Works* (2002) has been the lynchpin of best practice recommendations in developmental education since its publication; major studies of best practices in developmental education after that date may agree or disagree with the individual best practices as identified by Boylan, but no serious developmental education researcher or practitioner ignores them (e.g., Boroch et al, 2010; Sperling, 2009; Massachusetts Community Colleges, 2006). As described elsewhere in this study, Boylan's (2002) best practice recommendations resulted from a collaboration between the CQIN/APQC and the NCDE. This National Benchmarking Study of Developmental

Education in 1999-2000 inspired the identification of 33 widely-accepted best practices for developmental education.

Boylan (2002) categorized the best practices as relating to three areas: 1.) organizational, administrative, and institutional practices, 2.) program components, and 3.) instructional practices. Boylan cited 13 instructional strategies in his work, including the following [direct quotations in italics]:

1. *Develop learning communities.* This practice relates to learning communities for instruction as advocated by Tinto (1997). A learning community is a cohort of students taking two or more integrated courses together; the model may also include support services such as counseling, mentoring, or tutoring. Some learning communities are paired courses in which a developmental education course such as reading supports a college-level course. Tinto (2003) described the characteristics of a learning community as "shared knowledge" among the courses in the linked curriculum, "shared knowing" among the student participants who build cognitive skills together, and "shared responsibility" as students mutually depend on each other in collaborative groups.
2. *Accommodate diversity through varied instructional methods.* Boylan (2002) noted that "developmental students are among the most diverse in contemporary higher education," citing diversity in age, ethnicity, socio-economic status, and college preparation (p. 72). Boylan (2002) reported that the CQIN/APQC study found that good developmental instruction incorporates at least three different instructional methods each class period to accommodate a variety of learning styles, including the following techniques: distance learning, self-paced

instruction, individualized instruction, peer review of student work, collaborative learning, computer-based instruction, mastery learning, small-group work, and other active learning techniques (p. 73).

3. *Use supplemental instruction.* Boylan (2002) characterized supplemental instruction (SI), cited as an exemplary education program by the U.S. Department of Education (Martin and Arendale, 1992), as "probably the single most well documented intervention available for improving the academic performance of underprepared students" (p. 75). The website of The International Center for Supplemental Instruction at the University of Missouri - Kansas City (2011) defines the practice as "an academic assistance program that utilizes peer-assisted study sessions. SI sessions are regularly-scheduled, informal review sessions in which students compare notes, discuss readings, develop organizational tools, and predict test items. Students learn how to integrate course content and study skills while working together. The sessions are facilitated by "SI leaders," students who have previously done well in the course and who attend all class lectures, take notes, and act as model students."
4. *Provide frequent testing opportunities.* In this instance, testing is defined as "any activity that requires students to demonstrate their skills and knowledge according to some standard." The components that make this technique successful are study and preparation, relevance of topics to a particular concept or unit, grading against a standard, and feedback to students (Boylan, 2002, p. 79). This mastery learning tenet is also associated with the use of instructional technology (Kulik, 2003).

5. *Use technology in moderation.* Both the National Study of Developmental Education (1989-1996) and the CQIN/APQC (1999-2000) benchmarking study found that developmental instructors at best-practice institutions used technology successfully in a "supportive role," for tutoring and supplemental learning activities, not "as a primary instructional delivery system" (Boylan, 2002, pp. 81-83). In fact, Boylan, Bonham, Claxton, and Bliss (1992, cited in Boylan, 2002) identified an inverse relationship between use of computer technology and student success in developmental education courses.
6. *Provide frequent and timely feedback.* This feedback fosters metacognitive and self-regulatory skills in that it encourages students to "adjust their study and learning behaviors," and it reinforces student learning (Boylan, 2002, p. 84).
7. *Use mastery learning.* Mastery learning requires students to demonstrate mastery of a small unit of content before moving on the next unit. Boylan (2002) noted that many studies have demonstrated the effectiveness of mastery learning for developmental education, with numerous positive effects noted. For example, Boylan, Bonham, Claxton, and Bliss (1992) reported that mastery learning with developmental education students is associated with higher passage rates, higher grades, and better retention than for courses not using the technique.
8. *Link developmental course content to college-level requirements.* Students should be prepared to succeed in the next college-level course upon passage of the developmental-level course in the same subject area.

9. *Share instructional strategies.* Boylan (2002) stated that best-practice institutions "recognized that their faculty were valuable resources for each other and provided structured opportunities for such resources to be shared" (p. 93).
10. *Teach critical thinking.* Many studies have suggested that critical thinking instruction and practice, especially when integrated into developmental education courses, result in enhanced mastery of subject-area content and better performance in college courses (Boylan, 2002).
11. *Teach learning strategies.* Among many other proponents, McKeachie (2002) (updated in Svinicki and McKeachie, 2010), demonstrated that teaching students metacognitive strategies for learning increases content-area mastery and retention.
12. *Use active learning techniques.* Like teaching of critical thinking and learning strategies, the use of active learning techniques has seen much critical study and practice since the CQIN/APQC study, when the best practice institutions reported active learning techniques as a "major factor" in successful developmental education instruction (Boylan, 2002, p. 100).
13. *Use classroom assessment techniques*. Classroom assessment techniques are short formative assessments that students complete to provide feedback to the instructor for the purpose of assessing and improving the effectiveness of instruction (see Angelo and Cross, 1993).

Soon after the publication of *What Works,* Smittle (2003) wrote a seminal article on developmental education teaching practices, defining her work as "the product of integrating research findings from successful developmental education programs and general principles for effective teaching in undergraduate education." Smittle drew on

Boylan and Bonham's (1998) research with the NCDE as a major source of this synthesis, citing many of the same instructional principles that appeared in *What Works* (Boylan, 2002). Smittle also relied heavily on Roueche and Roueche's (1999) study of effective developmental education using the Community College of Denver as an exemplary model. Roueche and Roueche found the hiring and professional development of faculty members to be a "very significant factor," perhaps "the single most important factor" (p. 1), in Smittle's view, of successful developmental education. In addition, Smittle referenced the classic principles of effective college teaching found in the work of Chickering and Gamson (1987). Smittle summarized these guidelines well:

> The guidelines suggest that good practices encourage student-faculty contact, promote cooperation among students, encourage active learning, give prompt feedback, emphasize time on task, communicate high expectations, and respect diverse talents. (p. 1).

The six principles Smittle (2003) identified as most critical for teaching developmental education are as follows [direct quotations in italics]:

1. *Commit to teaching underprepared students.* This principle is related to the unfortunate research that the great majority of faculty members teaching developmental education are adjunct faculty members (Boylan, Bonham, Jackson, and Saxon, 1994) and that many faculty members teach developmental education as a result of metaphorically drawing a short straw in a course-assignment lottery in institutions without a centralized developmental education program (Boylan, 2002; Roueche & Roueche, 1999). The implication is that professional

developmental educators are better prepared to deal with both the cognitive and the affective issues associated with developmental education.

2. *Demonstrate good command of the subject matter and the ability to teach a diverse student population.* Smittle asserted that teaching and learning activities must include a wide variety of collaborative active learning that is highly structured and supervised, based in the "real world" and student interests. Mastery learning and frequent assessment with immediate feedback should also be employed.
3. *Address non-cognitive issues that affect learning.* Motivation, goal-setting, and "developing and maintaining positive self-esteem" with students are also critical components of developmental education (p. 5).
4. *Provide open and responsive learning environments.* Smittle emphasized personal contact with students such as calling them by name, inviting them personally to attend office hours, and calling them when they miss a class.
5. *Communicate high standards.* Smittle stated that effective developmental education teachers must clearly link their curriculum to subsequent college-level courses.
6. *Engage in ongoing evaluation and professional development.* This professional development may include not only the usual activities such as attending conferences and workshops, reading and writing journal articles, and enrolling in graduate coursework, but also specific training to teach developmental education as provided by graduate programs in the discipline and by the Kellogg Institute.

A year after the publication of Smittle's article, Simpson, Stahl, and Francis (2004) describe 10 best practices for developmental reading and learning-strategies teachers that also apply to other developmental education disciplines. These recommendations, based upon an earlier list of recommendations for "teaching high-risk college students" (Stahl, Simpson, & Hayes, 1992), include the following strategies, many of them directly related to a cognitive-based philosophy:

1. Adopt a programmatic model that emphasizes the cognitive development of students.
2. Emphasize strategy transfer and modification across the disciplines.
3. Emphasize students' flexible use of the processes embedded within a strategy.
4. Understand the impact of students' beliefs about reading and learning on their performance in college.
5. Understand the academic tasks students encounter and teach students how to define these tasks.
6. Adopt research-based approaches to vocabulary learning.
7. Teach students how to read and think about multiple sources.
8. Use a variety of valid assessment and diagnostic procedures.
9. Conduct valid, reliable, long-term program evaluation studies.
10. Understand that neither research nor pedagogy can be divorced from policy. (pp. 2-12)

Additional sets of developmental education best instructional practice recommendations have been developed in a somewhat interrelated way through the work of community colleges in California, Massachusetts, and Connecticut. Each of these has

drawn heavily on earlier research in developmental education, particular Boylan's *What Works* (2002), and the published studies related to each state's work also relate to the research of one or two of the other states in a somewhat circular way.

The most widely known of these is Boroch et al. (2010); this work presents the results of the California Community College Basic Skills Initiative's examination of existing developmental education research and development of a set of related best practices. These recommendations were derived from an extensive literature review of developmental education (as it relates to community colleges) over the last 30 years, and the instructional strategies section is based largely on widely-accepted adult learning theories. The earlier planning stages version of this work, known as the "Poppy Copy" (for its color), was published in three parts, with the literature review and effective practices in Gabriner et al. (2007). The California Basic Skills Initiative recommendations directly related to instructional practices include the following:

1. Sound principles of learning theory are applied in the design and delivery of courses in the developmental program.
2. Brain-based research informs instructional design.
3. Curricula and practices that have proven to be effective in specific disciplines are employed.
4. Developmental education faculty [sic] employ a variety of instructional approaches to accommodate student diversity.
5. Programs align entry and exit skills among levels and link course content to college-level performance requirements.

6. Developmental education faculty [sic] routinely share instructional strategies. (p. 51)

The Massachusetts Community College System (2006) made initial recommendations based upon the results of its three-year 100% Math Initiative to improve student success in developmental math. As with the developmental reading strategies above, many of the instructional techniques can be generalized to apply to other developmental education disciplines. The recommendations include the following instructional strategies:

1. Vary classroom methodology to "actively engage students in the learning process" using a variety of strategies including lecture, small group, and individual instruction as well as self-paced learning. "Because students learn best by active involvement, instructors should provide students the opportunity to do hands-on work in every class, and should orient their presentation to the real world application of the material" (p. 31).
2. Use textbooks that are "contextually rich" and that include "varied instructional methodologies," that include "numerous applications of the material," and that are "activity-based and hands-on" (p. 31.)
3. Teach based upon the awareness of a variety of student learning styles.
4. Incorporate campus support for learning-disabled students.
5. Emphasize homework and its value and offer support for "homework help and supervision" (p. 32).
6. Integrate strategies to assist students with "skills and understandings related to the learning process" (p. 32).

Sperling (2009) reported that the Massachusetts Community College System conducted a follow-up study of academic officers and faculty members at its institutions to survey usage of many developmental education-related best practices in a variety of areas established in the original 100% Math Initiative recommendations and three additional sources: *What Works* (Boylan, 2002), the Basic Skills Initiative work of the California Community Colleges as related, for example, in Boroch et al (2010), and the work of the Connecticut Community Colleges as reported, for example, in Schwartz and Jenkins (2007).

Those related to instruction were articulated as the following survey items:

1. Utilization of learning theory to inform the design of developmental education courses.
2. Active learning (e.g. hands-on work, problem solving groups, peer review, on-line interaction).
3. Integration between the developmental education subject area and another content area within one or more DE [developmental education] course(s) offered through the department.
4. The use of inquiry methods, problem-based learning, and/or engagement of students in simulations involving real-life experiences related to course content.
5. Generating sample test questions reflecting major course concepts, and/or planning and leading class discussions.
6. Engaging students in interviewing local experts/workplace representatives.
7. Varying of teaching methods and modes to accommodate a variety of learning styles.

8. Selection of course texts that incorporate numerous applications of the material and hands-on problem-solving activities.
9. Intentional integration of higher order thinking tasks, analytical reasoning, and problem solving.
10. Learning-to-learn skills (e.g. students learning to assess and monitor their motivation and learning, understanding learning strengths and weaknesses, using available resources to enhance students' own learning) taught within department's developmental education courses or in other courses/experiences that are linked to developmental education courses.
11. Study skills (e.g. textbook reading, note taking, test taking, time management) taught within DE courses or through required companion courses.
12. Learning labs as essential components of departmental developmental education courses.
13. *Supplemental Instruction* (where tutors or course assistants who are assigned to particular courses/faculty hold structured follow-up sessions) or *Coaching* tied to specific courses as required elements of departmental DE courses.
14. Intentional faculty use of methods that acknowledge cultural differences and/or the ways in which communication and learning takes place in students' cultures. (pp. 173-175)

The Connecticut Community College system also developed a set of instructional recommendations that relies heavily upon Boylan (2002), the California Basic Skills Initiative, and the 100% Math project, among others. Although this work is somewhat derivative, it offers a good summary of the existing literature. In their literature review

for use of the Connecticut system, Schwartz and Jenkins (2007) listed the following "promising developmental education practices" for classroom instruction, noting their relationship to adult learning principles embracing diverse student learning styles, and "dynamic student-and-student and teacher-and-student interactions." They stated that the strategies are meant to be used in conjunction with each other, that they relate to active or "student-centered" learning, and that they include a mix of individual and group activities (p. 7).

These classroom strategy recommendations include the following principles (most of them already discussed in the context of previous best practice recommendations):

1. Principles of instruction. (These relate to adult learning practices, as just summarized.)
2. Culturally responsive teaching.
3. Contextual teaching and learning.
4. Mastery and structured learning.
5. Collaborative learning.
6. Computer instruction.
7. Thinking skills development. (These skills include critical thinking, analytic reasoning, and problem solving skills)
8. Study skills and college success courses.
9. Frequent testing opportunities.
10. Homework.

In addition to these large studies, a few other studies have focused on particular discipline areas of developmental education. Hodara (2011) reviewed the literature on

developmental math classroom pedagogy and classified the studies into six major classroom approaches, including student collaboration, metacognition, problem representation, application, understanding student thinking, and computer-based learning. Hodara noted that the studies were generally inconclusive due to their poor methodology and that "very little empirical research" exists specifically related to developmental math education (p. 3). Nevertheless, she recommended two instructional strategies based upon the research with more rigorous designs: structured student collaboration and problem representation instruction (essentially, modeling problems using "multiple representations" and then requiring students to solve problems in multiple ways) (p. 28).

Mireles, Offer, Ward, and Dochen (2011) described the incorporation of various learning strategy instruction and metacognitive strategies in developmental math courses. Paul Nolting recommended many of the strategies previously discussed as best practices: in his words, " a multimodality instructional approach which means integrating the lecture with manipulatives, math study skills, and group work; learning math vocabulary words; using web-based support; tutoring students based on their learning style; giving frequent quizzes and practice tests; and inviting counselors into the class to discuss anxiety issues and provide a referral for personal problems" (Boylan, 2011b, p. 22).

The American Mathematical Association of Two-Year Colleges' *Beyond Crossroads* (Blair, 2006) recommended "standards for pedagogy" for "active student learning" in two-year colleges, including developmental math courses. These standards include teaching with technology, active and interactive learning, making connections, using multiple strategies (including "interactive lecturing, presentations, guided discovery,

teaching through questioning, and collaborative learning"), and experiencing mathematics (p. 6).

Stahl and Boylan's excellent edition of *Teaching Developmental Reading* (2003) provided a good overview of topics related to themes in best practices. These topics include historical contexts, paradigms and programs, teachers and praxis, strategic learning, new-to English learners, planning for a range of readers, reading in the content areas, the reading/writing connection, beyond the reading/writing connection, and technology. Many selections focus on active, collaborative, metacognitive, and contextual topics in developmental reading.

Bernstein's (2007) edition of background readings in *Teaching Developmental Writing* provided examples of several instructional practices relating to various best practice recommendations, including Remler's discussion of active learning, Elbow's collaborative writing techniques, and Raymond's learning community activities.

Armington (2002) also edited a *Best Practices in Developmental Math* compilation with NADE SPIN math members that is worth noting. This booklet contains short summaries and references of best practices on various topics, including working with developmental students, programmatic considerations, placement, teaching techniques and methodologies, innovation and reform, learning disabilities, and academic support. Some of these provide examples of hands-on, collaborative and active learning techniques. A second volume was published, or at least made available online, in 2003. Unfortunately, these resources are no longer readily available.

Obviously, developmental education best practice instructional recommendations as made by various researchers include many common elements and are based upon similar

sources of NCDE and adult learning theory research. These primary works by Boylan and the NCDE; Smittle; Simpson, Stahl, and Francis; the California Basic Skills Initiative; and the Massachusetts Community College System, along with the student learning theories they are based upon, formed the theoretical framework for this study.

CHAPTER THREE: RESEARCH METHODS

This study examined faculty members' perceptions of effectiveness and self-reported frequency of use of instructional practices that have been identified in the literature as effective for developmental education instruction. The research design, population, instrumentation, data collection, and analysis of the data are described below.

Research Design

This descriptive study employed a survey to examine the perspectives of developmental education faculty members at public community colleges regarding instructional practices that have been identified in the literature as effective for developmental education. The growing body of research on developmental education does not focus sufficiently on the instructional practices that work best with developmental education students, and particularly does not reflect the perspectives of faculty members as to whether these particular methods work. The study focused on two major areas related to the instructional practices surveyed: the degree to which faculty members perceive the practices to be effective, and the degree to which they state they employ the practices.

In addition, demographic information was collected and examined in an ex post facto design in order to determine whether there was a difference in faculty members' perceptions of instructional practice effectiveness and the frequency of use of these practices related to subject area taught and to various other independent demographic variables. These included choice to teach developmental education, age, sex,

race/ethnicity, highest degree earned, highest degree earned related to content area, and participation the Kellogg Institute. Further demographic variables included the number of years teaching full-time in developmental education, community colleges, and four-year colleges; teaching as an adjunct faculty member; and teaching in the P-12 system.

Population

The population for the study was the full-time developmental education faculty in each public community and technical college in the West Virginia Community and Technical College System (10 institutions). The researcher defined the developmental education faculty as those faculty members regularly teaching developmental reading, developmental writing, developmental math, developmental science, affective or student success skills, and ESL-focused versions of these subject areas. The faculty members in the survey population each teach regularly a minimum of three credit hours in developmental education out of their fifteen-credit-hour course load during at least one semester of the academic year. The researcher surveyed the entire population of qualifying faculty members (N=77).

Instrumentation

After an extensive literature review indicated that no existing survey instrument focused exclusively on best practices for developmental education instruction, the researcher developed a self-report questionnaire to collect data for this study (Appendix A). The dependent variable best-practice recommendations used in the survey instrument derived initially from two sources. The first source was Boylan's (2002) acclaimed *What Works* (Boylan, 2002), which summarized 33 research-based best practices for

developmental education relating to three areas: 1.) organizational, administrative, and institutional practices, 2.) program components, and 3.) instructional practices.

Boylan's 13 enumerated instructional practices (out of 33 best practices in all) also correspond well to a second source, Smittle's (2003) review of developmental education teaching practices, defined by her as "the product of integrating research findings from successful developmental education programs and general principles for effective teaching in undergraduate education." Smittle drew on Boylan and Bonham's (1998) research with the NCDE as a major source of this synthesis, citing many of the same instructional principles that later appear in *What Works* (Boylan, 2002). Smittle also relied heavily on Roueche and Roueche's (1999) study of effective developmental education using the Community College of Denver as an exemplary model and upon the classic principles of effective college teaching found in the work of Chickering and Gamson (1987).

Later, the researcher incorporated additional sources in determining particular recommended instructional practices to include in the survey, including Simpson, Stahl, and Francis (2004); the Massachusetts Community College Executive Office (2006); Schwartz and Jenkins (2007); Sperling (2009); and Boroch et al (2010).

Construction of the Survey

The "Pierce Survey of Developmental Education Instructional Practices" (Appendix A) consists of three sections. The first section asks faculty members to respond to 18 instructional practices. The survey items are the instructional practices as identified by Boylan (2002); Smittle (2003); Simpson, Stahl, and Francis (2004); Massachusetts Community Colleges (2006), also in Sperling (2009); the Connecticut

Community College System (Schwartz and Jenkins, 2007); and the California Community College Basic Skills Initiative (Boroch et al, 2010). The second section of the survey gathers demographic information, and the third section provides a space for survey participants to add any additional information they would like to include.

For part one, participants are asked to rate their perceptions of instructional practices using two 6-point Likert scales. The "effectiveness" scale asks how effective the practice is; it ranges from a score of 1 as "not at all effective" to 6 as "very effective." The "practice" scale asks how often faculty members actually employ the same practice, with 1 as "not used at all" and 6 as "used very frequently." Part One of the survey included the following items:

To foster student success, developmental educators must . . .

1. Incorporate affective development (student success skills, motivation, self-regulation, etc.) into classroom activities.
2. Thoroughly structure teaching and learning activities, with all requirements and standards clearly stated.
3. Relate the curriculum to "real world" applications.
4. Require students to master content before moving on to new concepts (mastery learning).
5. Provide frequent opportunities for students to demonstrate learning.
6. Provide frequent and timely feedback.
7. Use a variety of instructional methods (to accommodate diverse learning styles).
8. Employ active learning techniques.
9. Incorporate collaborative learning (group activities).

10. Integrate critical thinking skills into course instruction.
11. Integrate teaching of learning strategies into course instruction.
12. Accept responsibility for helping sustain and strengthen student motivation.
13. Create a supportive learning environment.
14. Foster student connections with the college community (e.g., use student names, contact them personally when they are absent, and invite them individually to attend office hours).
15. Use anonymous, ungraded classroom assessment techniques (e.g., one-minute papers). (Angelo and Cross, 1993).
16. Develop learning communities (groups of students taking two or more courses together).
17. Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).
18. Use technology as an instructional supplement (not as a primary instructional delivery system).

Part Two gathers selected faculty demographic characteristics, including subject area taught, whether teaching developmental education is by choice, age, sex, race/ethnicity, degree(s) earned, Kellogg Institute participation, and number of years teaching in particular settings. Part Two includes the following items:

19. Subject area(s) taught (mark all that apply): writing □ reading □ math □ ESL/ESOL □ college success/study skills □ science □
20. I teach developmental education courses by choice: yes □ no □
21. Age on December 31, 2011: years _____

22. Sex: male □ female □

23. Race/Ethnicity (mark all that apply): Hispanic or Latino □ American Indian or Alaska Native □ Asian □ Black or African-American □ Native Hawaiian or Other Pacific Islander □ White □

24. Highest degree earned: _____

25. Highest degree(s) earned related to content area: _____

26. Attended Kellogg Institute (for the training and certification of developmental educators): yes □ no □

27. Number of years teaching the majority of your course load in developmental education: years _____

28. Number of years teaching college as a full-time community college faculty member or educational administrator: years _____

29. Number of years teaching college as a full-time four-year college faculty member or educational administrator: years _____

30. Number of years teaching college as an adjunct (not full-time) faculty member: years _____

31. Number of years teaching at the P-12 level (even if these years overlap with college teaching): years _____

The final segment of the survey is an open-ended qualitative prompt. The researcher expected that comments would most likely clarify previous survey responses but might also add additional relevant data. The final item reads as follows:

32. Please add any other information or comments you would like to include.

Survey Validity and Reliability

The initial survey instrument was piloted for clarity and construct validity at the Kellogg Institute for the Training and Certification of Developmental Educators at the National Center for Developmental Education at Appalachian State University in Boone, North Carolina. The researcher piloted the survey with the 2011 instructors and class members of the Kellogg Institute and then conducted two focus groups to further refine the questionnaire. Of 39 total surveys, participants completed 26, for a return rate of 67%. Additionally, two focus groups, one with five members and one with nine members, met to discuss survey items and further clarify and refine them to ensure that the items would be accurately interpreted by faculty members completing the survey. Finally, the researcher was able to meet independently with two of the top experts in the field of developmental education, Hunter Boylan and Barbara Bonham, to discuss further enhancements to the questionnaire, as described in Appendix B.

Following the expert recommendations, the researcher triangulated survey questions with several additional sources. The first source from Simpson, Stahl, and Francis (2004) describes 10 best practices for developmental reading and learning strategies, themselves based upon an earlier set of recommendations for "teaching high-risk college students" (Stahl, Simpson, & Hayes, 1992). Additional sets of developmental education best instructional practice recommendations have been developed through the work of community colleges in California, Massachusetts, and Connecticut. Each of these draws heavily on earlier research in developmental education, particularly Boylan's *What Works* (2002). In addition, the published studies related to California, Massachusetts, and Connecticut community college research also draw upon

earlier publications of the research from the California and Massachusetts systems in a somewhat circular way.

The Massachusetts Community College System (2006) made initial recommendations based upon the results of its three-year 100% Math Initiative to improve student success in developmental math. As with the developmental reading strategies above, many of the instructional techniques can be generalized to apply to other developmental education disciplines. Sperling (2009) reported that the Massachusetts Community College System conducted a follow-up study of academic officers and faculty members at its institutions to survey usage of many developmental education-related best practices in a variety of areas established in the original 100% Math Initiative recommendations and in three additional sources: *What Works* (Boylan, 2002), the Basic Skills Initiative work of the California Community Colleges as related, for example, in Boroch et al. (2010), and the work of the Connecticut Community Colleges as reported, for example, in Schwartz and Jenkins (2007).

Boroch et al. (2010) presented the results of the California Community College Basic Skills Initiative's examination of existing developmental education research and development of a set of related best practices. These recommendations were derived from an extensive literature review of developmental education (as it relates to community colleges) over the last 30 years, and the instructional strategies section was based largely on widely-accepted adult learning theories.

After initially refining the survey instrument for accuracy and readability following the pilot survey, focus groups, and individual meetings with experts, the researcher triangulated each of the best practice survey dependent variables with the

initial and additional sources. If a survey item did not appear in a majority of the sources, it was removed from the questionnaire.

Data Collection

The researcher first began by verifying the survey population. She had developed an initial list of faculty members in West Virginia public CTC's teaching developmental education in conjunction with Mary Ann Thorn, then-President of the West Virginia Association of Developmental Education, in 2011. The researcher compared this list to course schedules posted online at each of the 10 CTC websites for the current 2011-2012 academic year and cross-referenced these sources with online faculty directories. Next, she sent a request via email to chief academic officers (CAO's) at each of 10 CTC's. The email asked the CAO's to verify and correct a list of faculty members teaching developmental education regularly as defined in the study parameters. The response from CAO's indicated a total of 80 faculty members in the population, excluding the researcher.

Next, the researcher emailed an invitation to complete the survey to each of the 80 full-time faculty members identified as teaching developmental education regularly in the WVCTCS—that is, teaching at least three credit hours each academic year. The survey invitation contained an embedded link to an electronically-delivered survey at Survey Monkey, along with an attached anonymous survey consent. Because the survey was totally anonymous, the researcher also asked participants to respond when they had completed the survey or if they declined to participate (so that faculty members who had already completed the survey would not be bothered by additional survey reminders if such needed to be sent). Three persons responded to the survey invitation that they were

not eligible to complete the survey: one of them taught only college-level classes, and two of them were Adult Basic Education teachers who offered pre-college preparation only, as distinct from developmental education. Thus, the researcher determined the total study population to be 77 faculty members.

The researcher kept track of participants who responded that they had completed the survey. (A few faculty members' email responses that they had completed the survey also included comments pertinent to the research topic.) Up to two additional sets of email reminders were sent by the researcher to faculty members who did not respond initially. Also, the researcher contacted a colleague at each of the institutions with less than 100% reported participation and asked these colleagues to send a request for survey completion. Both of these techniques resulted in additional returns. Finally, the researcher attended a state developmental education workshop along with many faculty members in the survey population and made a final in-person and email request for completion with a survey cut-off date one week from that time. The final survey population was 77, with the entire population surveyed. A total of 69 surveys, for an 89.6% response rate, were completed.

Analysis of the Data

Due to the interest in developmental education in the state of West Virginia with its on-going West Virginia Developmental Education Task Force and intensive professional development provided through a Complete College America grant, the researcher selected full-time developmental education faculty members in this state as the population of the study. Thus, the researcher selected a nonprobability sampling technique for data analysis. As explained in Kerlinger and Lee's *Foundations of*

Behavioral Research, 4th Edition (2000, pp. 178-185) and in Henry's *Practical Sampling* (1990, pp. 17-25), sample selection processes that do not employ random sampling techniques fall into the category of nonprobability sampling. Henry noted that the lack of randomness creates the risk of bias. "While the necessity of a nonprobability sample may be apparent in many cases, its use increases the uncertainty in using the sample data to represent the population." (Henry, 1990, p. 24). Henry (p.25) emphasized this point in the following sentence, "However, the researcher should be well aware of the risks posed by using a nonprobability sample—risks to validity and credibility of the findings." Only with random samples can one make statements of statistical certainty concerning any given sample statistic's representation of the associated population parameter. The researcher acknowledges this limitation.

Nonetheless, nonprobability samples are often used in research designs. Henry (p. 23) affirms, "Nonprobability sampling is a useful and expedient method of selecting a sample in certain circumstances. In many situations it is appropriate, and in some cases, the only method available."

A second consideration in the selection of sampling technique had to do with sample size. Even though the author considered random sampling, the small size of the study population, $N = 77$, meant that random sampling processes would have dictated a large proportion of the population be sampled anyway. Thus, attempting a full census of the population was determined to be more reasonable than sampling.

Data analysis for such a study design could not employ inferential statistics, based on random probability sampling and parameter estimation theory. Instead, the researcher

examined the distribution of responses in light of her specialized knowledge of the population and study topic, as suggested in Kerlinger and Lee:

> In probability sampling the emphasis is placed on the method and the theory behind it. With nonprobability sampling the emphasis relies on the person doing the sampling, and that can bring with it an entirely new and complicated batch of concerns. The person doing the sampling must be knowledgeable of the population to be studied and the phenomena under study. (p. 178)

Nonetheless, full census was not achieved, with a survey response rate of 89.6%. Therefore, as is common in nonprobability sampling research designs, all analysis will consist of the "census" of the respondents. That is, the respondents will be treated as a census population. It will be left to the reader to judge whether the population parameters calculated for the respondent population can be generalized to the non-respondents (which are, in this study, a separate population). The researcher asserts that the high response rate of 89.6% makes such generalizations reasonable, but makes no assertions of statistical certainty.

The researcher tabulated survey results and percentages for each of the first 18 survey questions that asked for Likert-scale responses. Data from part two, the demographic section, were considered as independent variables. Each of the eighteen survey items included as instructional practices in part one were considered as dependent variables. These data were ordinal in nature, scored on two different 6-point Likert scales, one of Effectiveness and one of Practice. In addition, the researcher coded responses from part three, the open-ended qualitative section, and analyzed these responses for themes. The research questions were analyzed as specified below.

Research Question One

What are the perceptions of developmental education faculty members concerning the effectiveness of instructional practices identified in the literature as best practices for student success in developmental education?

Survey questions 1-18 explored this question. Each of the items was rated on an effectiveness scale ranging from a score of 1 as not effective at all to 6 as very effective. The survey asked participants to rate a group of statements beginning with the phrase, "To foster student success, developmental educators must. . . ." Survey data were analyzed by comparing percentages of each Likert-scale rating to determine if there was a difference in observed frequency as opposed to expected frequency in respondents' answers to each of the 18 survey items. The researcher expected that the study population would be quite familiar with developmental education recommended instructional practices and would rate most practices as critically important, that is, with the majority of responses for each survey item rated as 5 and 6.

Research Question Two

What are the perceptions of developmental education faculty members concerning their frequency of use of instructional practices identified in the literature as best practices for student success in developmental education?

Survey questions 1-18 also explored this question. Each of the items was rated on a practice scale of how often participants employ the practice, ranging from a score of 1 as not used at all to 6 as used very frequently. The survey asked participants to rate a group of statements that begins with the phrase, "To foster student success, developmental educators must. . . ." Survey data were analyzed by examining

percentages of each Likert-scale rating to determine if there was a difference in observed frequency as opposed to expected frequency in respondents' answers to each of the 18 survey items. Again, the researcher expected that the study population of well-informed developmental educators would self-report frequency of use of most recommended instructional practices quite high, that is, with the majority of responses for each survey item rated as 5 and 6.

Research Question Three

What is the relationship, if any, between developmental education faculty members' perception of effectiveness and self-reported frequency of use of instructional practices identified in the literature as best practices for student success in developmental education?

Again, survey questions 1-18 explored this research question. Survey respondents' responses to the questions on the effectiveness scale were compared to their responses on the frequency scale using percentages of each Likert-scale rating to determine if there was an observable difference in respondents' answers to each of the 18 survey items on the two Likert scales. This research question attempted to determine whether and to what degree faculty members actually use instructional practices that they consider important.

Research Question Four

Is there a difference in developmental education faculty members' perception of effectiveness of instructional practices identified in the literature as best practices for student success in developmental education related to a faculty member's subject area taught?

This research question explored possible relationships of subject matter taught (identified in item 19) with particular instructional practices identified as effective in survey items 1-18. The subject area choices include developmental writing, developmental reading, developmental math, ESL/ESOL, college success/study skills, and developmental science.

Research Question Five

Is there a difference in developmental education faculty members' frequency of use of instructional practices identified in the literature as best practices for student success in developmental education related to a faculty member's subject area taught?

This research question examined the relationships of the subject matter that a faculty member teaches (identified in survey question 19) with particular instructional practices identified as used frequently in survey items 1-18. The subject area choices include developmental writing, developmental reading, developmental math, ESL/ESOL, college success/study skills, and developmental science.

Research Question Six

Is there a difference in developmental education faculty members' perception of effectiveness of instructional practices identified in the literature as best practices for student success in developmental education related to selected faculty demographics?

This research question examined possible relationships between particular instructional practices identified as effective in survey questions 1-18 and various demographic factors, as identified in survey questions 20-31.

Research Question Seven

Is there a difference in developmental education faculty members' frequency of use of instructional practices identified in the literature as best practices for student success in developmental education related to selected faculty demographics?

This research question examined possible relationships of various demographic factors as identified in survey questions 20-31 with particular instructional practices identified as used frequently in survey questions 1-18.

CHAPTER FOUR: FINDINGS

This chapter examines data from the survey, including responses relating to the independent variables of population demographics, the dependent variables of perceptions of effectiveness and frequency of use, and qualitative responses to an open-ended question that the researcher coded and analyzed for themes.

Participants

The researcher surveyed the entire survey population of full-time faculty members who teach developmental education regularly in public CTC's in West Virginia (N=77). A total of 69 surveys, for an 89.6% response rate, were completed. Given this high response rate, the survey results should represent the entire population quite accurately; as explained previously, the researcher treated the responses as a census population for the purpose of analysis.

The respondents reported teaching in the following subject areas: writing - 30, reading - 19, math - 32, ESL/ESOL - 3, college success/study skills - 13, and science - 1. Respondents were asked to mark all subject areas that applied. Much of the overlap occurred in the areas of writing and reading and in the combination of one of both of these areas with college success/study skills, since these areas are often taught by the same faculty members in West Virginia public community colleges. Sixteen faculty members taught only writing, 2 taught only reading, and 6 taught both writing and reading. Nine taught writing and/or reading combined with study skills, and 2 of these 9 faculty members taught ESL/ESOL, as well. One faculty member taught college success/study skills exclusively. In contrast, 26 of the faculty members teaching math

taught only math courses. An additional 2 math faculty members also taught study skills. Surprisingly, 3 faculty members taught math, writing, and reading; an additional faculty member taught math, reading, ESL/ESOL, college success/study skills, and science.

A large number of these faculty members (86.2%) reported teaching developmental education courses by choice. However, one respondent clarified in the open-ended response section that he/she "primarily" teaches literature courses, while a second respondent noted, "Although I was hired primarily to teach developmental writing, assignments have included a wide range of classes in literature, writing, and multidisciplinary courses."

The average reported age of respondents was 50.89 years, with a range of ages from 25 to 65 (median age 45 years, mode 54). A majority, 67.2%, of the respondents were female; this figure is atypical of the state population as a whole, reported as 50.7% female (U.S. Census, 2010). It is also atypical of the population of U.S. faculty members (full-time and part-time, all institution types) as a whole, reported in 2009 as 47.1% female (National Center for Education Statistics, 2010).

The survey directed respondents to mark all race/ethnicities that applied, but no respondent marked more than one choice. White was the race/ethnicity reported by 93.7% of respondents. The total included 2 Black or African-American participants (3.2%), 1 Hispanic or Latino participant (1.6%), and 1 Asian participant (1.6%), with no American Indian/Alaskan native or Native Hawaiian/Pacific Islander participants. For the most part, the survey population is consistent with the West Virginia population as a whole, a mix of 93.9% white persons (93.2% white non-Hispanic persons), 3.4% Black persons, 1.2% Hispanic/Latino persons, 0.7% Asian persons, 0.2% American

Indian/Alaskan native persons, and less than 0.1% native Hawaiian/other Pacific islanders, with only 1.5% reporting 2 or more race/ethnicities (U.S. Census, 2010).

The majority of respondents (45) reported a master's degree as the highest degree earned, with 11 respondents possessing a doctorate, 2 an MFA degree, and 7 a bachelor's degree. The responses were mostly the same for the open-ended "highest degree(s) earned related to content area" question, and responses did not provide further clarity. In total, nine participants reported a different degree for this question than they did in the "highest degree earned" question. However, responses to this question could not be categorized clearly, and the researcher disregarded the survey responses to this question. Only 2 respondents (3.1%) had attended the Kellogg Institute for the Training and Certification of Developmental Educators, with one of these respondents citing the "Dev Ed Specialist" credential.

As a whole, the respondents possessed a large amount of college teaching experience as full-time faculty members. The average time that respondents had taught the majority of their course loads in developmental education was 11.20 years, with a range of 0 to 37 years (median 18.5 years, mode 10 years). They had spent 10.78 years on average teaching as full-time community college faculty members or educational administrators, with a range of 1 to 39 years (median 19.5 years, mode 1 year). In contrast, respondents had spent much less time teaching as full-time four-year college faculty members or educational administrators, an average of only 3.48 years, with a range of 0 to 29 years (median 14.5 years, mode 0 years). Overlap with some of these categories was unclear, as seven CTC's in the system had separated in the past decade from their parent four-year institutions with varying degrees of completeness. The

researcher did not determine whether participants considered time spent teaching at a CTC component of a four-year institution as CTC or four-year teaching experience—or both.

Respondents had spent additional years teaching as adjunct faculty members or teachers in the public school system. The average number of additional years that respondents had spent teaching as adjunct (not full-time) faculty members was 5.30 years, with a range of 0 to 28 years (median 14 years, mode 2 years). The number of years teaching in the P-12 system (even if these years overlapped with college teaching) was 5.16 years, with a range of 0 to 39 years (median 19.5 years); the mode was 0 years, with 28 faculty members possessing no P-12 system teaching experience. Clearly, some of these respondents were very experienced teachers, having begun a second career after retiring from the public school system; however, it seems likely that instructional practices may have differed in the public school setting, at least as regards practices based upon pedagogy as opposed to andragogy.

One respondent commented in the open-ended response section that the survey questions asking respondents to report the number of years they had worked were "flawed in a way that makes the results suspect." (The respondent had wished to report teaching experience as semesters rather than academic years.) Another theme that emerged in the open-ended responses was a comparison of developmental education to the public school system. One respondent questioned, "Why aren't they [students] learning this in the high schools?" Another noted, "My public school assignment was grades 7-12. I consider all of the courses that I taught developmental." Unfortunately, it is unclear whether the respondent was referring to subject matter or to the

cognitive/affective/social components of developmental education—or to something else entirely.

Research Variables

The survey instrument used to collect data for this study was the *Pierce Survey of Developmental Education Instructional Practices* developed by the researcher (Appendix B). The first 18 survey items, the dependent variables of the study, are based upon recommended instructional practices for developmental education as identified in the literature. Each of these survey items measures two responses, a perception of effectiveness and a perception of frequency of use. The next 13 survey items collect demographic information about the population; these are the independent variables of the study. The final qualitative item is a simple open-ended response to collect any additional qualitative information and comments that participants wish to include.

Incomplete Data

Some of the participants left some cells in the survey blank. The survey was designed so that participants could choose not to answer a particular survey item and continue with the survey after skipping that response. In addition, the survey was organized in four pages on Survey Monkey online, so that questions 1-9 appeared on page one, 10-18 appeared on page two, 19-26 appeared on page three, and questions 27-32 appeared on page four. Questions 1-18 asked for two responses, one immediately below the other: the first response was an effectiveness rating on a 6-point Likert scale, while the second response was a frequency of usage rating on a 6-point Likert scale. Essentially, skipping any response deliberately was easy, but overlooking a particular response was also quite possible.

Of the first 18 questions, the most skipped responses on any one question was 3 out of the 69 total on question 11 (integrate teaching of learning strategies into course instruction); every other question had 67-69 responses. In contrast, the demographic items in questions 19-31 ranged from 62-66 responses out of 69 total participants, with only 60 participants responding to the question regarding number of years teaching as an adjunct. No particular pattern of skipped responses was evident. However, two respondents completed only the first page (questions 1-9), and one respondent completed only two pages (questions 1-18), perhaps declining deliberately to provide demographic information.

The first three research questions were based on the first 18 survey items, rated for perceptions of both effectiveness and frequency of use on a 6-point Likert scale. The following analysis of these research questions compared observed versus expected frequencies of ratings.

Research Question One

What are the perceptions of developmental education faculty members concerning the effectiveness of instructional practices identified in the literature as best practices for student success in developmental education?

In the light of West Virginia's ongoing Developmental Education Task Force project, professional development as provided by a Complete College America grant, and long-time interest and activity by West Virginia developmental educators in a professional organization, the West Virginia Association for Developmental Education, the researcher expected that the study population would be quite familiar with developmental education recommended instructional practices and would rate most

practices as critically important, that is, with the majority of responses for each survey item rated as 5 and 6. Indeed, results were quite striking.

A simple examination of the data as presented in Table 1, below, revealed that for each of the first 18 effectiveness ratings of recommended instructional practices as articulated in the developmental education literature, the survey population overwhelmingly perceived that the recommended practices were effective, with responses grouped in each case on the "very effective" side of the Likert scale rather than the "not at all effective" side.

In fact, 14 of the 18 effectiveness questions contained only 0-3 responses (0-4.5%) in the Likert-scale categories of 1 and 2 *combined*. Even the few exceptions (questions 9, 14, 16, and 17) displayed a noticeably larger percentage of responses in categories 5 and 6 (combined) as compared to categories 1 and 2 (combined). For question 9 (collaborative learning) 8.7% of respondents rated the instructional practice's effectiveness in the low-end Likert-scale 1 and 2 categories, while 52.2% of respondents rated the effectiveness in the high-end 5 and 6 categories. For question 15 (classroom assessment techniques), 9.2% of respondents rated the effectiveness low (1 and 2) while 41.5% rated the effectiveness high (5 and 6). Question 16 (learning communities) respondents reported 10.6% low effectiveness ratings and 48.5% high effectiveness ratings; also, question 17 (supplemental instruction) respondents reported 7.8% low effectiveness ratings and 62.5% high effectiveness ratings. Even the least extreme distributions displayed a much larger percentage of responses in the high-end rankings of the effectiveness scale.

Table 1
Faculty Perceptions of Effectiveness of Recommended Instructional Practices

Instructional Practice Recommended in the Literature (Survey questions reported here in shortened form.)	Number/Percentage 1 - not at all effective; 6 - very effective.					
To foster student success, developmental educators must. . .	1	2	3	4	5	6
1. Incorporate affective development into activities.	1 1.4%	0 0.0%	11 15.9%	9 13.0%	19 27.5%	29 42.0%
2. Thoroughly structure teaching and learning activities.	0 0.0%	0 0.0%	1 1.4%	3 4.3%	28 40.6%	37 53.6%
3. Relate the curriculum to "real world" applications.	0 0.0%	1 1.4%	2 2.9%	14 20.3%	23 33.3%	29 42.0%
4. Require students to master content before moving on.	0 0.0%	1 1.4%	4 5.8%	19 27.5%	20 29.0%	25 36.2%
5. Provide frequent opportunities to demonstrate learning.	0 0.0%	0 0.0%	1 1.5%	5 7.4%	20 29.4%	42 61.8%
6. Provide frequent and timely feedback.	0 0.0%	0 0.0%	0 0.0%	2 2.9%	17 24.6%	50 72.5%
7. Use a variety of instructional methods.	0 0.0%	0 0.0%	3 4.3%	8 11.6%	23 33.3%	35 50.7%
8. Employ active learning techniques.	0 0.0%	0 0.0%	4 5.8%	6 8.7%	35 50.7%	24 34.8%
9. Incorporate collaborative learning.	1 1.4%	5 7.2%	10 14.5%	17 24.6%	19 27.5%	17 24.6%
10. Integrate critical thinking skills into course instruction.	0 0.0%	0 0.0%	3 4.5%	10 14.9%	21 31.3%	33 49.3%
11. Integrate teaching of learning strategies into course instruction.	0 0.0%	2 3.0%	7 10.6%	15 22.7%	18 27.3%	24 36.4%
12. Accept responsibility for supporting student motivation.	0 0.0%	3 4.5%	4 6.0%	18 26.9%	23 34.3%	19 28.4%

13. Create a supportive learning environment.	0 0.0%	0 0.0%	1 1.5%	4 6.0%	16 23.9%	46 68.7%
14. Foster student connections with the college community.	0 0.0%	0 0.0%	4 6.0%	13 19.4%	24 35.8%	26 38.8%
15. Use anonymous, ungraded classroom assessment techniques.	2 3.1%	4 6.2%	19 29.2%	13 20.0%	18 27.7%	9 13.8%
16. Develop learning communities.	5 7.6%	2 3.0%	12 18.2%	15 22.7%	19 28.8%	13 19.7%
17. Use supplemental instruction.	3 4.7%	2 3.1%	8 12.5%	11 17.2%	19 29.7%	21 32.8%
18. Use technology as an instructional supplement.	1 1.5%	1 1.5%	6 9.0%	10 14.9%	21 31.3%	28 41.8%

Research Question Two

What are the perceptions of developmental education faculty members concerning their frequency of use of instructional practices identified in the literature as best practices for student success in developmental education?

Again, the researcher expected that the study population of well-informed developmental educators would self-report frequency of use of most recommended instructional practices quite high—that is, with the majority of responses for each survey item rated as 5 and 6.

As with the first research question, the distributions fell conspicuously into this pattern. An examination of the data, presented in Table 2, below, reveals that for 15 of the 18 frequency-of-use ratings of recommended instructional practices as articulated in the developmental education literature, the survey population's faculty members overwhelmingly reported that they used the recommended practices frequently with

responses grouped in each case on the "used very frequently" side of the Likert scale rather than the "not used at all" side.

In fact, 11 of the 18 frequency-of-use questions contained only 0-3 responses (0-4.5%) in the Likert-scale categories of 1 and 2 combined. These questions included numbers 1, 2, 3, 5, 6, 7, 8, 10, 12, 13, and 14. Several additional questions still displayed a noticeably larger percentage of responses in categories 5 and 6 (combined) as compared to categories 1 and 2 (combined). For question 4 (mastery learning) 8.7% of respondents rated the instructional practice's frequency-of-use in the low-end Likert-scale 1 and 2 categories, while 58.0% of respondents rated the frequency-of-use in the high-end 5 and 6 categories. For question 9 (collaborative learning), 18.8% of respondents rated the frequency-of-use low (1 and 2) while 39.1% rated the frequency-of-use high (5 and 6). For question 11 (teaching of learning strategies), 9.1% of respondents rated the frequency-of-use low, and 53.0% rated it high. Question 18 (technology as an instructional supplement) respondents reported 9.0% low frequency-of-use ratings and 70.1% high frequency-of-use ratings.

However, three questions in this section displayed atypical responses. On question 15 (classroom assessment techniques), 43.3% of respondents reported frequency-of-use as low, while only 11.9% reported it as high. Similarly, on question 16 (learning communities), 50.7% reported frequency-of-use as low, while 11.9% reported it as high; on question 17 (supplemental instruction), 52.2% reported frequency-of-use as low, while 20.9% reported it as high.

Table 2
Faculty Perceptions of Frequency of Use of Recommended Instructional Practices

Instructional Practice Recommended in the Literature (Survey questions reported here in shortened form.)	Number/Percentage 1 - not at all effective; 6 - very effective.					
To foster student success, developmental educators must. . .	1	2	3	4	5	6
1. Incorporate affective development into activities.	1 1.4%	2 2.9%	8 11.6%	14 20.3%	23 33.3%	21 30.4%
2. Thoroughly structure teaching and learning activities.	0 0.0%	1 1.4%	4 5.8%	3 4.3%	28 40.6%	33 47.8%
3. Relate the curriculum to "real world" applications.	0 0.0%	2 2.9%	8 11.6%	18 26.1%	21 30.4%	20 29.0%
4. Require students to master content before moving on.	1 1.4%	5 7.2%	5 7.2%	18 26.1%	25 36.2%	15 21.7%
5. Provide frequent opportunities to demonstrate learning.	0 0.0%	1 1.5%	1 1.5%	3 4.4%	27 39.7%	36 52.9%
6. Provide frequent and timely feedback.	0 0.0%	0 0.0%	2 2.9%	4 5.8%	15 21.7%	48 69.6%
7. Use a variety of instructional methods.	1 1.4%	2 2.9%	3 4.3%	19 27.5%	22 31.9%	22 31.9%
8. Employ active learning techniques.	0 0.0%	1 1.5%	6 8.8%	15 22.1%	31 45.6%	15 22.1%
9. Incorporate collaborative learning.	2 2.9%	11 15.9%	13 18.8%	16 23.2%	17 24.6%	10 14.5%
10. Integrate critical thinking skills into course instruction.	0 0.0%	1 1.5%	7 10.6%	13 19.7%	24 36.4%	21 31.8%
11. Integrate teaching of learning strategies into course instruction.	1 1.5%	5 7.6%	11 16.7%	14 21.2%	18 27.3%	17 25.8%
12. Accept responsibility for supporting student motivation.	0 0.0%	3 4.5%	7 10.6%	16 24.2%	22 33.3%	18 27.3%

13. Create a supportive learning environment.	0 0.0%	0 0.0%	2 3.0%	3 4.5%	20 29.9%	42 62.7%
14. Foster student connections with the college community.	0 0.0%	0 0.0%	6 9.0%	18 26.9%	22 32.8%	21 31.3%
15. Use anonymous, ungraded classroom assessment techniques.	18 26.9%	11 16.4%	18 26.9%	12 17.9%	7 10.4%	1 1.5%
16. Develop learning communities.	19 28.4%	15 22.4%	13 19.4%	12 17.9%	5 7.5%	3 4.5%
17. Use supplemental instruction.	22 34.3%	12 17.9%	9 13.4%	9 13.4%	9 13.4%	5 7.5%
18. Use technology as an instructional supplement.	4 6.0%	2 3.0%	9 13.4%	5 7.5%	16 23.9%	31 46.3%

Research Question Three

What is the relationship, if any, between developmental education faculty members' perception of effectiveness and self-reported frequency of use of instructional practices identified in the literature as best practices for student success in developmental education?

Table 3, below, presents the results of Spearman's Rho correlation parameter of the scores for each survey question on the effectiveness scale and frequency-of-use scale. With the exception of three survey questions, the relationship between the effectiveness and frequency-of-use scales was strong; that is, when survey participants rated perception of effectiveness high, they also rated perception of frequency-of-use high, and vice versa. These findings are not unexpected: Faculty members who rate instructional practices are effective would be expected to also report that they use such practices frequently.

However, the participant responses for survey questions 15 (classroom assessment techniques), 16 (learning communities), and 17 (supplemental instruction) appeared noticeably different when comparing the effectiveness and frequency-of-use responses, with more participants rating the effectiveness high in each case while rating the frequency-of-use for these items low. For survey question 15, 9.3% of respondents rated the instructional practice's effectiveness in the low-end Likert-scale 1 and 2 categories, while 41.5% of respondents rated the frequency-of-use in the high-end 5 and 6 categories. In contrast, 43.3% of respondents rated the frequency-of-use in the low-end Likert scale 1 and 2 categories, with 11.9% of respondents rating the frequency-of-use in the high-end 5 and 6 categories. Effectiveness responses to question 16 included 10.6% low-end responses and 48.5% high-end responses; however, 50.8% of frequency-of-use responses were in the low-end 1 and 2 categories, with 12.0% in the high-end 5 and 6 categories. Responses to survey question 17 offer a similar contrast. Low-end effectiveness responses were 7.8% and high-end responses were 62.5%; however, low-end frequency-of-use responses were 52.2% and high-end responses were 20.9%.

Table 3
Faculty Perceptions of Effectiveness and Frequency of Use of Recommended Instructional Practices

Survey Item Instructional Practice Recommended in the Literature (Survey questions reported here in shortened form.)	First Rating: 1 - not at all effective; 6 - very effective. Second Rating: 1 - not used at all; 6 - used very frequently.						Correlation Coefficient, Spearman's Rho Parameter Obtained
To foster student success, developmental educators must . . .	1	2	3	4	5	6	
1. Incorporate affective development into activities.	1 1	0 2	11 8	9 14	19 23	29 21	0.553
2. Thoroughly structure teaching and learning activities.	0 0	0 1	1 4	3 3	28 28	37 33	0.438

3. Relate the curriculum to “real world” applications.	0 0	1 2	2 8	14 18	23 21	29 20	0.213
4. Require students to master content before moving on.	0 1	1 5	4 5	19 18	20 25	25 15	0.494
5. Provide frequent opportunities for students to demonstrate learning.	0 0	0 1	1 1	5 3	20 27	42 36	0.598
6. Provide frequent and timely feedback.	0 0	0 0	0 2	2 4	17 15	50 48	0.465
7. Use a variety of instructional methods.	0 1	0 2	3 3	8 19	23 22	35 22	0.525
8. Employ active learning techniques.	0 0	0 1	4 6	6 15	35 31	24 15	0.523
9. Incorporate collaborative learning.	1 2	5 11	10 13	17 16	19 17	17 10	0.608
10. Integrate critical thinking skills into course instruction.	0 0	0 1	3 7	10 13	21 24	33 21	0.354
11. Integrate teaching of learning strategies into course instruction.	0 1	2 5	7 11	15 14	18 18	24 17	0.594
12. Accept responsibility for supporting student motivation.	0 0	3 3	4 7	18 16	23 22	19 18	0.614
13. Create a supportive learning environment.	0 0	0 0	1 2	4 3	16 20	46 42	0.409
14. Foster student connections with the college community.	0 0	0 0	4 6	13 18	24 22	26 21	0.356
15. Use anonymous, ungraded classroom assessment techniques.	2 18	4 11	19 18	13 12	18 7	9 1	0.448
16. Develop learning communities.	5 19	2 15	12 13	15 12	19 5	13 3	0.493
17. Use supplemental instruction.	3 22	2 12	8 9	11 9	19 9	21 5	0.307

18. Use technology as an instructional supplement.	1 4	1 2	6 9	10 5	21 16	28 31	0.661

Research Question Four

Is there a difference in developmental education faculty members' perception of effectiveness of instructional practices identified in the literature as best practices for student success in developmental education related to a faculty member's subject area taught?

Four major subject areas emerged from participants' responses: writing, reading, math, and college success/study skills. (Only three participants taught ESL/ESOL, and only one taught science.) However, as described above, many writing and reading faculty members also taught the other subject, ESL/ESOL, and/or college success/study skills. A few math faculty members also taught study skills, and one faculty member taught every subject except writing.

The initial analysis of the data grouped into exclusive combinations of subjects taught resulted in thirteen categories as depicted in table 4 below.

Table 4
Analysis Categories for Subject Area Taught
N = 66

Category	N	%
1. Writing	16	24.2%
2. Reading	2	3.0%
3. Math	26	39.4%
4. College Success/Study Skills	1	1.5%
5. Writing & Reading	6	9.1%
6. Writing & College Success	2	3.0%
7. Reading & College Success	3	4.5%
8. Reading & ESL & College Success	1	1.5%
9. Writing & Reading & College Success & ESL	2	3.0%
10. Math & College Success	2	3.0%
11. Reading & Math & ESL & College Success & Science	1	1.5%

12. Writing & Reading & Math	3	4.5%
13. Writing & Reading & College Success	1	1.5%

The distribution of faculty members' perceptions of effectiveness of the recommended instructional practices identified in the literature was consistent across categories for each of the 18 related survey items.

The researcher perceived two overall groups of faculty members, however, with a few outliers that could not be classified into one of the particular groups without further information. The first category was faculty members who taught math, including the two faculty members who also taught college success/study skills; this category included 28 faculty members. The second category was 33 faculty members who taught reading and/or writing—in West Virginia, as in many other states, these subjects are frequently taught by the same person—including faculty members who also taught college success/study skills and/or ESL/ESOL. One survey participant reinforced this concept in a follow-up email after completing the survey. She explained that two adjunct faculty members had taught for a number of semesters before being hired as full-time faculty members. One of them had taught both writing and reading and one had taught only reading. The person who had taught both subject areas (most recently reading) was hired to teach writing full-time, while the person who had taught writing was hired as a reading faculty member.

There were five faculty members who did not fit into one of the two categories, including one faculty member who selected every subject except writing, one faculty member who taught only college success/study skills, and three faculty members who

taught reading, writing, and math. Eliminating these five faculty members and dividing the remaining 61 faculty members into two categories allowed further analysis.

With this category division, survey items 3, 8, and 9 indicate a possible relationship between subject area taught and faculty perceptions of effectiveness of these instructional practices. Surprising, for each of these survey questions, reading/writing faculty members rated the instructional practices higher than math faculty members. In the distribution for item 3, "real world" applications, a visual survey of the distribution reveals a large number of responses in the "very effective" 6 rank of the scale for the writing/reading category, whereas the math responses, also clustered toward the "very effective" end, are more evenly distributed between ranks of 5 and 6. Writing/reading responses on item 8, active learning, are grouped heavily in ranks 5 and 6, whereas the majority of math responses are 5's. Item 9, collaborative learning, also seems to be more popular with writing/reading faculty, with 23 out of 33 total responses as 5's and 6's; in contrast, the largest number of math responses was 4's. The distribution of responses for these items is depicted in Table 5, below.

Table 5
Subject Area Taught Effect upon Faculty Perceptions of Effectiveness of Recommended Instructional Practices
Responses to Selected Items by Category

Survey Item	1	2	3	4	5	6
3. Relate the curriculum to "real world" applications.						
Math Category	0	1	1	7	14	5
Writing/Reading Category	0	0	1	5	5	22
8. Employ active learning techniques.						
Math Category	0	0	1	4	18	5
Writing/Reading Category	0	0	1	2	13	17
9. Incorporate collaborative learning (group activities).						
Math Category	1	1	5	13	5	3
Writing/Reading Category	0	3	4	3	10	13

Research Question Five

Is there a difference in developmental education faculty members' frequency of use of instructional practices identified in the literature as best practices for student success in developmental education related to a faculty member's subject area taught?

Participants identified four major subject areas taught: writing, reading, math, and college success/study skills. The initial analysis of the data grouped into exclusive combinations of subjects taught resulted in thirteen categories; as with the effectiveness analysis, the distribution of faculty members' perceptions of frequency of use of the recommended instructional practices identified in the literature was consistent across categories for each of the 18 related survey items.

However, dividing the faculty members into two overall groups of faculty members and performing produced different results. The first category was faculty members who taught math, including the two faculty members who also taught college success/study skills; this category included 28 faculty members. The second category was faculty members who taught reading and/or writing, including faculty members who also taught college success/study skills and/or ESL/ESOL. Five faculty members did not fit into one of the two categories.

This analysis produced interesting findings for items 3, 8, 9, 12, and 18. The distribution for item 3, "real world" applications, contains a large number of responses in the "very effective" 6 rank of the scale for the writing/reading category, whereas the math responses, also clustered toward the "very effective" end, are greater in rank 5. The

distribution of item 8, active learning, is very similar in the math category, whereas writing/reading responses are grouped heavily in ranks 5 and 6.

Item 9, collaborative learning, was more evenly distributed overall, but more math rankings were in the lower end of the scale, while more writing/reading rankings were at the higher end. The distribution of item 12, sustaining student motivation, was similar to that of item 3, with both math and reading/writing responses clustered toward the "very effective" end of the scale; however, ranks 5 and 6 contained the largest number of writing/reading responses, whereas ranks 4 and 5 contained the most math responses.

Item 18, using technology as a supplement (not a primary instructional method) produced very interesting distributions. The great majority of math responses were in rank 6, whereas the majority of writing/reading responses were in ranks 5 and 6. This result was surprising in light of the decision by several West Virginia CTC's to offer math instruction through the emporium model (Twigg, 2011) of self-paced mastery-learning math modules offered via computer technology.

Table 6 below displays the distribution of responses for these items.

Table 6
Subject Area Taught Effect upon Faculty Perceptions of Frequency of Use of Recommended Instructional Practices
Responses to Selected Items by Category

Survey Item	1	2	3	4	5	6
3. Relate the curriculum to "real world" applications.						
Math Category	0	1	4	7	13	3
Writing/Reading Category	0	0	3	7	7	16
8. Employ active learning techniques.						
Math Category	0	1	2	9	13	3
Writing/Reading Category	0	0	1	4	16	11
9. Incorporate collaborative learning (group activities).						
Math Category	2	6	8	5	5	2
Writing/Reading Category	0	4	5	7	9	8

12. Accept responsibility for helping sustain and strengthen student motivation.						
Math Category	0	2	4	8	9	5
Writing/Reading Category	0	1	2	5	12	12
18. Use technology as an instructional supplement (not as a primary instructional delivery system).						
Math Category	1	0	3	1	5	17
Writing/Reading Category	3	2	3	4	10	11

Research Question Six

Is there a difference in developmental education faculty members' perception of effectiveness of instructional practices identified in the literature as best practices for student success in developmental education related to selected faculty demographics?

Selected faculty demographics include age, sex, ethnicity/race, highest degree earned, and choice to teach developmental education. In addition, respondents were asked about number of years teaching the majority of courses in developmental education, teaching full-time at community colleges, teaching full-time at four-year colleges, teaching as an adjunct faculty member, and teaching in the P-12 system. The category of highest degree earned related to content area yielded results similar to highest degree earned and was eliminated from analysis. Analysis of the effect of most of these independent variables upon the dependent variables of recommended instructional practices did not result in unusual distributions, with a few exceptions. Each demographic variable is discussed below in the order in which it appeared on the survey instrument.

Item 19 asked respondents whether they teach developmental education by choice. This item is first on the list of best practice recommendations by Smittle (2003)

and also figures prominently in the literature. In institutions without a centralized developmental education program, faculty members are assigned developmental education courses even though they may not necessarily prefer to teach them (Boylan, 2002; Roueche & Roueche, 1999); these faculty members may not understand the specialized concerns of the courses or the recommended instructional methods. However, 86.2% of the CTC faculty members surveyed in this study reported that they do teach developmental education by choice.

The independent variable of teaching developmental education by choice displayed an effect on only one of the dependent variables, using classroom assessment techniques (CAT's). Faculty members who do not teach developmental education by choice rated classroom assessment techniques much lower in general than those who do teach the classes by choice; this second category of faculty members had a far greater percentage of high-end scale responses. Table 7, below, displays the distribution of responses.

Table 7
Teaching Developmental Education by Choice Effect upon Faculty Perceptions of Effectiveness of Recommended Instructional Practices
Responses to Selected Items by Category

Survey Item	1	2	3	4	5	6
3. Use anonymous, ungraded classroom assessment techniques (e.g., one-minute papers).						
Not Taught by Choice Category	0	2	5	0	0	1
Taught by Choice Category	1	2	13	13	17	8

An analysis was also performed to determine if the next independent variable, age of respondents, had an effect on the dependent variables of instructional practices recommended in the literature. Respondents were divided into age categories as shown

in Table 8, below. However, distributions of effectiveness responses to survey questions across age categories were consistent.

Table 8
Analysis Categories for Participant Age in Years
N = 62

Category	N	%
1. 20-29 years	2	3.2%
2. 30-39 years	8	12.9%
3. 40-49 years	14	22.6%
4. 50-59 years	22	35.5%
5. 60-69 years	16	25.8%

In contrast, distributions of responses between the categories showed that the effect of the independent variable sex upon faculty perceptions of effectiveness of recommended instructional practices varied for survey items 1, 2, and 13. Item 1, affective development, has more female ratings in the 6 rank, with good representation in the 4 and 5 ranks, while the male ratings are clustered more heavily in the 5 rank, with good representation in the 3 and 6 ranks, as well. Item 2, thoroughly structure teaching and learning activities, contains higher rankings in the 6 category by females, with good representation in the 5 category; in contrast, the males chose more 5 rankings with good representation in the 6 category. Finally, females overwhelmingly chose a 6 rank on the next item, create a supportive learning environment, while males split their responses evenly between 6 and 5 rankings, with one 4. Table 9 below illustrates these data.

Table 9
Sex Effect upon Faculty Perceptions of Effectiveness of Recommended Instructional Practices
Responses to Selected Items by Category

Survey Item	1	2	3	4	5	6
1. Incorporate affective development (student success skills, motivation, self-regulation, etc.) into classroom activities.						
Female Category	1	0	3	7	8	24
Male Category	0	0	7	0	10	6
2. Thoroughly structure teaching and learning activities, with all requirements and standards clearly stated.						
Female Category	0	0	2	2	13	28
Male Category	0	0	0	3	12	7
13. Create a supportive learning environment.						
Female Category	0	0	0	3	5	35
Male Category	0	0	0	1	10	10

With respect to the independent variable of race/ethnicity, only one survey item showed an unusual distribution that indicated an effect on the dependent variables of instructional practices recommended in the literature; however, it should be noted that 59 out of 63 respondents to this demographic item were White persons, with only one Hispanic or Latino person, one Asian person, and two Black or African American persons. Survey participants who were white persons ranked item 13, a supportive learning environment, higher than the single survey participants in the Asian and Hispanic categories, while the respondents who were Black/African American ranked the item lower.

The next independent variable, highest degree earned, was open response. Answers were sorted into the degree categories of doctoral, master's, and baccalaureate degrees, with an additional MFA degree category as this degree is often regarded as a terminal degree. Table 10 below shows the number and percentage of respondents in

each category. An analysis of the effect of highest degree earned produced only normal distributions.

Table 10
Analysis Categories for Highest Degree Earned
N = 65

Category	N	%
1. Doctoral Degree	11	16.9%
2. Master's Degree	45	69.2%
3. Bachelor's Degree	7	10.8%
4. Master of Fine Arts Degree	2	3.1%

The next demographic item asked faculty members whether they had attended the Kellogg Institute for the Training and Certification of Developmental Educators. Only two respondents had attended. When examining distributions of responses for this demographic category, no unusual findings emerged.

The next few demographic survey questions asked participants to respond with a number of years in that category. Some of the years-type responses could be overlapping, as with years teaching developmental education and years teaching in a community college. Some were exclusive, such as the number of years a faculty member had spent teaching as an adjunct, not full time. The categorized responses related to number of years that a faculty member had taught the majority of his/her course load in developmental education are depicted in Table 11 below.

Table 11
Analysis Categories for Number of Years Teaching the Majority of Course Load in Developmental Education
N = 65

Category	N	%
1. 0-4 years	18	27.7%
2. 5-9 years	14	21.5%
3. 10-14 years	14	21.5%
4. 15-19 years	6	9.2%
5. 20-24 years	5	7.7%
6. 25-29 years	3	4.6%
7. 30-34 years	4	6.2%
8. 35-39 years	1	1.5%

An analysis of this variable's effect upon the faculty members' perceptions of the effectiveness of recommended instructional practices revealed three interesting findings. The distribution for item 1, incorporating affective development (student success skills, motivation, self-regulation, etc.) into classroom activities, shows that faculty members who had taught developmental education for 25-34 years rated this item the highest at 6, followed by those who had taught developmental education for 20-24 years, 0-4 years, 5-9 years, 10-14 years, 35-39 years (one respondent, rating 5), and 15-19 years (responses ranging from 6 to 3).

The distribution of responses to item 8, active learning techniques, was a little more varied, centered primarily in the 6 and 5 ratings, but also containing some 4's and 3's. Faculty members who had taught developmental education for 20-24 years chose the highest effectiveness rating, followed by those who had taught developmental education for 25-29 years, 30-34 years, 10-14 years, 0-4 years, 5-9 years, 15-19 years (these responses ranged lower, from 5 to 3), and 35-39 years (one respondent, rating 3).

The distribution of item 11, integrating the teaching of learning strategies into course instruction, contained responses ranging from 6 to 3. Faculty members teaching

developmental education for 25-29 years rated this item the highest, followed by those teaching for 5-9 years, 10-14 years, 35-39 years (rating 5), 20-24 years, 30-34 years, 0-4 years, and 15-19 years (responses ranging from 5 to 3).

The variable of number of years teaching as a full-time community college faculty member/administrator was also reported as a single number by respondents and categorized, as displayed in Table 12, below.

Table 12
Analysis Categories for Number of Years Teaching College as a Full-Time Community College Faculty Member or Educational Administrator
N = 65

Category	N	%
1. 0-4 years	18	27.7%
2. 5-9 years	18	27.7%
3. 10-14 years	14	21.5%
4. 15-19 years	5	7.7%
5. 20-24 years	3	4.6%
6. 25-29 years	2	3.1%
7. 30-34 years	1	1.5%
8. 35-39 years	4	6.2%

An analysis of the effect of years teaching full-time at a community college over the dependent variables revealed only one interesting finding. The distribution for item 6, providing frequent and timely feedback, was highest at a 6 rating for faculty members teaching in a community college for 25-39 years, followed by those teaching 5-9 years, 0-4 years, 10-14 years, 20-24 years (ratings ranging from 6 to 5), and 15-19 years (ratings ranging from 6-4).

Participant responses for the demographic item number of years teaching in a four-year institution were divided into categories as shown in Table 13, below.

Table 13
Analysis Categories for Number of Years Teaching College as a Full-Time Four-Year College Faculty Member or Educational Administrator
N = 62

Category	N	%
1. 0-4 years*	46	74.2%
2. 5-9 years	5	8.1%
3. 10-14 years	8	12.9%
4. 15-19 years	0	0%
5. 20-24 years	2	3.2%
6. 25-29 years	1	1.6%

*38 responses in this category were 0.

An analysis performed on the effect of this variable upon faculty perceptions of effectiveness of recommended instructional practices displayed one interesting distribution. The distribution for item 18, using technology as an instructional supplement varied among categories from a category with mostly 6 ratings (faculty members teaching at four-year institutions for 5-9 years) to a category rated 3 (the single faculty member teaching 25-29 years). The category of faculty members teaching in four-year institutions 0-4 years, which included 38 out of 46 faculty members who had never taught in a four-year institution, rated survey item 18 quite highly, with a large number of 6 and 5 responses, a few 4's, and fewer than five 2's and 3's. The category of faculty members teaching 10-14 years in four-year institutions gave mixed responses ranging from 6 to 3, with no 1 or 2 responses.

The number and percentage of years teaching as an adjunct faculty member is reflected in Table 14, below. An analysis of distributions for this category revealed no interesting findings.

Table 14
Analysis Categories for Number of Years Teaching College as an Adjunct (Not Full-Time) Faculty Member
N = 60

Category	N	%
1. 0-4 years*	35	58.3%
2. 5-9 years	14	23.3%
3. 10-14 years	7	11.7%
4. 15-19 years	1	1.7%
5. 20-24 years	2	3.3%
6. 25-29 years	1	1.7%

*10 responses in this category were 0.

The final independent variable was years teaching in the P-12 school system. Some developmental educators in West Virginia began their teaching careers in this system or retired from it and began a second career at the college level. (Many adjunct faculty members in developmental education also work full-time in the P-12 system.) Notably, 28 respondents had not taught in the P-12 system at all, but 2 respondents had taught there 30-34 years, and 2 had taught there 35-39 years. The number and percentages of respondents in categories for this item are reported in Table 15, below.

Table 15
Analysis Categories for Number of Years Teaching at the P-12 Level (Even If These Years Overlap with College Teaching)
N = 62

Category	N	%
1. 0-4 years*	41	66.1%
2. 5-9 years	11	17.7%
3. 10-14 years	4	6.5%
4. 15-19 years	2	3.2%
5. 20-24 years	0	0%
6. 25-29 years	0	0%
7. 30-34 years	2	3.2%
8. 35-39 years	2	3.2%

*28 responses in this category were 0.

For this demographic item, the distribution for item 4, requiring students to master content before moving on to new concepts (mastery learning), was interesting. Respondents who had taught in the P-12 system 15-19 and 30-34 years ranked this item highest, followed by those who had taught 5-9 years, 0-4 years, 10-14 years, and 35-39 years.

Overall, analyses for this research question indicated that the effect of most demographic items on faculty perceptions of effectiveness of instructional practices recommended in the literature was limited.

Research Question Seven

Is there a difference in developmental education faculty members' frequency of use of instructional practices identified in the literature as best practices for student success in developmental education related to selected faculty demographics?

As with the previous research question, selected faculty demographics include age, sex, ethnicity/race, highest degree earned, highest degree earned related to subject area taught (results disregarded), choice to teach developmental education, Kellogg certification, number of years teaching the majority of courses in developmental education, number of years teaching full-time at community colleges, number of years teaching full-time at four-year colleges, number of years teaching as an adjunct faculty member, and number of years teaching in the P-12 system. Numbers of years were grouped into categories, as were degrees earned.

An analysis was performed to determine whether the independent variable of teaching developmental education by choice had an effect on faculty perceptions of

frequency of use of instructional practices recommended in the literature. Only normal distributions were found.

An analysis of age effect upon faculty frequency of use perceptions of recommended instructional practices identified only one interesting distribution for survey item 6, providing frequent and timely feedback. Faculty members in both the 20-29 years and 60-69 years age categories rated this item the highest, followed in the distribution by those age 50-59 years, 30-39 years, and 40-49 years.

In contrast, the effect of the independent variable sex upon perceptions of frequency of use produced interesting results with several distributions for survey items 1, 2, 5, 6, 12, and 13, as noted in Table 16, below. For item 1, incorporation of affective development, female responses were rated heavily as 4's, 5's, and 6's, whereas male responses clustered in rating 5. Item 2 was thoroughly structure teaching and learning activities. Most female responses were rating 6, with a number of 5 ratings, as well; in contrast, the great majority of males chose a rating of 5. Females considered item 6, providing frequent and timely feedback, critical, with 33 respondents rating it 6, used very frequently, and 10 respondents rating it 5. The most predominant rating for males was also 6, with responses also distributed in 5, 4, and 3 ratings.

Responses to item 12, accepting responsibility for helping sustain and strengthen student motivation, created a similar distribution, with the heaviest female responses in the 6, 5, and 4 rating categories, whereas males chose more 5's and 4's. Finally, responses to item 13, creating a supportive learning environment, were very similar to those on item 6, with females choosing a large number of 6 ratings, some 5's and a single

4 rating, whereas males rated the item with 6's and 5's, and some 4's and 3's. In general, males rated all the items with significant findings a little lower than females did.

Table 16
Sex Effect upon Faculty Perceptions of Frequency of Use of Recommended Instructional Practices
Responses to Selected Items by Category

Survey Item	1	2	3	4	5	6
1. Incorporate affective development (student success skills, motivation, self-regulation, etc.) into classroom activities.						
Female Category	1	0	3	11	10	18
Male Category	0	2	4	2	11	2
2. Thoroughly structure teaching and learning activities, with all requirements and standards clearly stated.						
Female Category	0	0	2	2	12	27
Male Category	0	0	2	1	14	4
5. Provide frequent opportunities for students to demonstrate learning.						
Female Category	0	0	0	1	12	27
Male Category	0	0	1	2	12	6
6. Provide frequent and timely feedback.						
Female Category	0	0	0	0	10	33
Male Category	0	0	1	4	4	12
12. Accept responsibility for helping sustain and strengthen student motivation.						
Female Category	0	2	3	7	14	17
Male Category	0	1	3	8	8	1
13. Create a supportive learning environment.						
Female Category	0	0	0	1	10	32
Male Category	0	0	2	2	9	8

Item 13, creating a supportive learning environment, was the only distribution that was interesting in examining effects of race/ethnicity upon faculty perceptions of frequency of use of recommended instructional practices The distribution ranged from a rating of 6 by the Hispanic respondent, followed by the white respondents, the two Black/African American respondents and the Asian respondent, who rated the frequency of use at 3.

An analysis of highest degree earned upon the faculty perceptions of frequency of use of instructional practices recommended in the literature found one interesting distribution on item 1, incorporating affective development into classroom activities. In this case, the distribution of responses was similar for participants with doctoral, master's, and bachelor's degrees in the 5/6 very frequently used end of the scale, with the two participants with MFA degrees rating the frequency of use on the lower end of the scale, at 2 and 3.

An analysis of several other independent demographic variables revealed no effects on faculty perceptions of frequency of use of recommended instructional practices. These variables included the following: participation in the Kellogg Institute for the Training and Certification of Developmental Educators, number of years teaching developmental education, number of years teaching college as a full-time faculty member or educational administrator, number of years teaching at a four-year institution, and number of years teaching as an adjunct faculty member.

An analysis of the effect of years teaching at the P-12 level upon faculty perception of frequency of use of recommended instructional practice resulted in one

interesting finding, for item 4, mastery learning. (This effect was also noted for faculty perception of effectiveness for mastery learning.) The mean ranks from highest to lowest were distributed as follows: 5-9 years teaching P-12, 10-15 years, 30-34 years, 0-4 years, 15-19 years, and 35-39 years (ratings of 3 and 2).

Overall, for research question seven, significant effects of demographic items upon faculty perceptions of frequency of use were very limited except for the independent variable of sex.

CHAPTER FIVE: CONCLUSIONS

This chapter contains conclusions and discussion concerning the study of faculty perceptions of recommended instructional practices for developmental education. It incorporates qualitative open-ended comments that have been coded and analyzed for themes in addition to analysis of quantitative survey item responses. It includes discussion of the demographics of the survey population, critically important instructional practices, and effects of demographic factors, followed by recommendations for further study and concluding thoughts.

Demographics of the Survey Population

The survey population consisted of all full-time faculty members who regularly teach developmental education in West Virginia public CTC's, a total of 77 faculty members, excluding the researcher. Of this total population, 69 faculty members participated in the survey, for a total response rate of 89.6%. The high return of 89.6% for the survey population gives a strong indication that survey returns are characteristic of the entire population. For the purpose of analysis, the researcher treated the population as census.

The population was of particular interest due to an ongoing (begun in 2011) Developmental Education Task Force project involving its faculty members and sponsored by the WVCTCS in order to improve student success in developmental education. In a follow-up email, one participant commented,

> [Before coming to West Virginia, I taught in another state that] is very resistant to recognizing the place of developmental education—in fact, so much so that WV seems ten times more evolved and willing to address the issue. I love working in WV and I love what the state is doing as far as treating it as a real issue that needs addressed—WV is doing a lot more than many people realize with developmental and I feel really proud to be a part of our CTC system.

Developmental educators in West Virginia public CTC's, in general, exhibit an intense interest in the field, as demonstrated by the large response rate.

The participants themselves identified as 65.2% female and 31.8% male. The average reported age for respondents was 50.9 years, with a range of ages from 25 to 65. Most respondents identified their race/ethnicity as white (93.7%), with one Hispanic/Latino participant, one Asian participant, and two Black/African American participants. The majority of respondents (69.2%) reported a master's degree as highest degree earned, followed by doctoral degrees (16.9%), bachelor's degrees (10.8%), and MFA degrees (3.1%). Only two respondents had attended the Kellogg Institute for the Training and Certification of Developmental Educators.

The average number of years respondents had taught the majority of their course loads in developmental education was 11.20 years, with a range of 0-37 years. They had spent 10.78 years on average teaching as full-time community college faculty members/educational administrators (range 1-39 years). The participants taught several subject areas in a variety of combinations, including writing, reading, math, ESL/ESOL, college success/study skills, and science. Of the 66 faculty members who identified subject area taught, the population could be characterized as 28 faculty members who

taught math (with the additional area of college success/study skills, in a few cases) and 33 faculty members who taught writing and/or reading (with the additional areas of college success/study skills and ESL/ESOL). Five additional faculty members did not fit into one of these two particular subject area categories.

After completing the survey, one survey respondent sent the researcher an additional email that perhaps clarifies the responses that some faculty members do not teach developmental education by choice:

> Many of our dev. Ed [sic] English faculty [members] have traditional English MAs—literature over composition. . . .We have a few "young guns" who took a dev. ed. job to "get their foot in the door" in higher ed and are very vocal about their desire to teach college algebra and calc, etc. That is all fine, and the two teaching goals are not incompatible—HOWEVER, some of our own faculty's perception of developmental ed is as discriminatory as the age-old discrimination of community colleges by colleges and universities.

Another respondent who sent a separate email after completing the survey also commented on this topic, "One thing I notice in developmental [education] is that there is a common misconception that anyone can teach it. . . ."

Critically Important Instructional Practices

As expected by the researcher, the study population of West Virginia educators agreed overwhelmingly with recommended instructional practices and also reported that they used the practices frequently. In fact, the distribution of survey population responses showed clearly a preponderance of responses toward the "very effective" and "used very frequently" ends of the scale on nearly every item surveyed. Developmental

educators in this population were in almost complete agreement with all best practice recommendations for teaching developmental education.

For the purpose of this study, survey items with a majority of responses in the 5 and 6 Likert scale ratings were designated at critically important. Using this guideline, the only recommended instructional practices *not* perceived as critically important in effectiveness by faculty members were classroom assessment techniques (CAT's), and learning communities. Those instructional practices *not* self-reported as critically important in frequency of use by faculty members were classroom assessment techniques, learning communities, collaborative learning, and supplemental instruction.

In the open-ended comment section, some faculty members linked frequency of use of various instructional practices to limited resources. One respondent noted,

> There are many instructional techniques that could be helpful to students if the facilities, classroom availability, and administrative support existed. It seems that in WV, the current scapegoat for low retention and graduation rates is developmental education. In open access colleges, developmental education must be supported at the state and college levels for the opportunity it provides for under-prepared students to enter college. It is an opportunity NOT a roadblock.

Another mentioned the lack of resources for some of the instructional practices recommended in the literature:

> I would love to do learning communities as I have used these at another college and found them to be very effective—however, this strategy is only given lipservice at my institution and when it comes time to schedule or coordinate these, there are always a myriad of reasons why it cannot be done. . . . I also feel,

> as a full time developmental educator, that developmental education is not treated as a professional area of development by our institutions. . . . [They allow] anybody and everybody to teach it and keep it staffed with high numbers of part timers.

One respondent noted in the open response section that he/she "would LOVE to attend Kellogg, and would gladly go if funding opportunities existed." Finally, another faculty member cited a need for the resource of time, "There's never enough time to do everything I'd like to do with students."

In effect, although participants perceived the practices were effective, they may have lacked the resources to implement them. Further, participants may not truly have understood that no resources are required for classroom assessment techniques other than one or two minutes of class time; it is notable that participants in the pilot study indicated that the instructional practices in questions 15, 16, and 17 required definition. It is interesting that the techniques not perceived as critically important all require specialized rather than general knowledge to implement them successfully. Many practitioners may not be comfortable using collaborative learning, learning communities, or supplemental instruction, in particular, in a classroom without specific professional development first. As noted in the open-ended survey responses, two of these techniques, learning communities and supplemental instruction, also require institutional support in order to schedule and run them successfully.

Another theme related to instructional techniques emerged in the open-ended response section after coding of the 13 responses, with some participants stressing that

developmental education is a distinct field due to its emphasis on development of the entire student. One participant wrote,

> I am a firm believer that in developmental education, the mantra should be "Student first, Then Content." Too many people teaching Dev Ed see it as a "lesser" than as an "equal" and use it only as a stepping stone. The ability to appreciate all students and work well with them and have a genuine interest in them as people is paramount, I believe, to their success and desire to stay in school whether they're able to or not. . . . Teaching dev ed writing is not just a "junior" version of English I—not in approach, anyway.

This participant was emphasizing the distinction between developmental education and remediation, the idea that developmental educators work to improve their students' cognitive, affective, and social skills in order to promote student success. Another respondent commented, "It isn't just about getting the lacking basic skills, it is about getting the mind set that college is possible and achieveable that leads to our students [sic] eventual success. The frame of mind must be fostered along with the basics." These comments reinforce the importance of recommended instructional practices such as survey item 1 (incorporating affective development).

Effects of Demographic Factors

The effect of demographic factors on perceived effectiveness and frequency of use of recommended instructional practices was limited, indicating that most responses could be generalized as applicable to the general population of faculty members teaching developmental education regularly without regard to a particular demographic category.

The sex of respondents demonstrated the most widespread effect upon faculty perceptions of effectiveness and frequency of use of instructional practices. Those practices identified included incorporating affective development, thoroughly structuring teaching and learning activities, providing frequent opportunities for students to demonstrate learning (frequency of use only), providing frequent and timely feedback (frequency of use only), accepting responsibility for student motivation (frequency of use only), and creating a supportive learning environment. In all of these cases, females rated the practices more effective and/or more frequently used than males. Interestingly, some of these practices such as creating a supportive learning environment fit into the common stereotype that females are more nurturing than males.

The subject area taught by faculty members also demonstrated a significant effect on faculty perceptions of several instructional practices, but only when divided into two categories of writing/reading and math. These practices included relating the curriculum to "real world" applications, employing active learning techniques, incorporating collaborative learning, accepting responsibility for motivating students (frequency of use only), and using technology as an instructional supplement, not as a primary instructional delivery system (frequency of use only). With all of these practices except the use of technology, writing/reading faculty members rated the practices more effective and/or more frequently used than math faculty members did. However, the use of technology as a supplement rather than as a primary instructional delivery system was rated more frequently used by the math teachers. Although this finding is somewhat surprising for the first three techniques mentioned, all associated strongly with math in the literature (c.f. , Armington, 2003; Sperling, 2009), it does make sense for the final technique, using

technology as an instructional supplement. In actuality, many math faculty members in West Virginia use Pearson's *MyMathLab* or *MathXL* computerized instruction in this manner.

Other demographic factors such as teaching developmental education by choice, age, race/ethnicity, highest degree earned, attendance at the Kellogg Institute, years teaching the majority of one's course load in developmental education, years teaching full time at a community college, years teaching full time at a four-year institution, years teaching as an adjunct, and years teaching in the P-12 system had minimal or no effect on faculty perceptions of effectiveness and/or frequency of use. Findings include the following, in order of demographic item appearance on the survey:

- Teaching developmental education by choice had an effect upon perception of the effectiveness of using classroom assessment techniques (CAT's), with those teaching developmental education by choice rating the effectiveness higher than those who not teaching it by choice.
- Participants' age demonstrated an effect in faculty perceptions of frequency of use of providing frequent and timely feedback.
- Participants' race/ethnicity had an effect upon perceptions of both effectiveness and frequency of use of creating a supportive learning environment.
- Participants' highest degree earned demonstrated an effect upon perception of frequency of use of incorporating affective development, with participants who possessed a MFA degree rating the item lower.
- Participants' years teaching the majority of their course load in developmental education had an effect on their perceptions of effectiveness of thoroughly

structuring teaching and learning activities, employing active learning techniques, and integrating teaching of learning strategies into course instruction.

- Participants' years teaching full-time in a community college had an effect upon their perceptions of effectiveness of providing frequent and timely feedback.
- Participants' years teaching full-time in a four-year institution had an effect upon their perceptions of the effectiveness of using technology as an instructional supplement (not as a primary instructional delivery system). Mean ranks were lower for those teaching in four-year institutions 20 or more years.
- Participants' years teaching in the P-12 system had an effect upon their perceptions of both effectiveness and frequency of use of mastery learning.

Not many of these findings are easily interpreted, with age categories, particularly, falling into no clear pattern of distribution.

Recommendations for Further Study

The study of faculty perceptions of the effectiveness and frequency of use of instructional practices recommended in the literature for developmental education student success was carried out with faculty members in West Virginia public community and technical colleges that taught developmental education regularly. While the 89.6% response rate for the population of 77 faculty members was excellent, it would be interesting to see how the study results generalize to other populations. Replication of the study with similar populations in other states would add to the strength of the findings.

One area that was difficult to interpret with study data was subject area taught. This difficulty was due to the multiple subject areas that many faculty members reported.

Further study is definitely indicated to confirm the effects of subject matter taught upon perceptions of effectiveness and frequency of use of particular instructional practices, particularly since some of the findings did not support practices recommended in the math literature. This topic would be easier to interpret in a further study if participants indicated only the primary subject area taught or if they were given a more limited choice of subject area from predetermined categories.

Of particular interest with the analysis of faculty responses to the recommended instructional practices were the practices that did *not* rank as critically important. Classroom assessment techniques, for example, have been recommended in the literature for years; the Angelo and Cross (1993) handbook is a classic. Likewise, Tinto's (2003) learning community research is generally quite well known in the higher education community, and the supplemental instruction model was certified as an exemplary education program in the early 1980's (Martin and Arendale, 1992). Collaborative learning is also a recommended instructional practice, particularly for math (c.f., Armington, 2003; Sperling, 2009). It would be interesting to discover why participants did not rank these practices as critically important in effectiveness and/or usage. Was the lack of resources crucial, as suggested by some participants? Did faculty members need professional development before attempting some of the more specialized techniques? Did they even understand exactly what these instructional practices involved? It is notable that these were practices that the pilot study identified as needing additional definition or examples in the survey questions themselves. A qualitative study could pursue this topic in more depth.

Concluding Thoughts

The purpose of this study was to determine developmental educators' perceptions of the importance of the instructional practices that have been recommended in the literature for the field of developmental education: what instructional practices are most effective and how frequently faculty members employ these practices in the classroom. It analyzed whether such perceptions are widely held and actually applied in the classroom setting and whether there is any relationship between their use and particular demographic characteristics of faculty members. The information gained from this study as to the critical importance of these recommended instructional techniques can lead to improved teaching practices in the field, to related improvements in course and program design, and thus to increased student success in developmental education, increased success in subsequent courses, increased student retention, and increased graduation rates.

The survey instrument provides a method for individual faculty members, developmental education departments, and institutions to assess their own teaching practices against identified best practices and design professional development to address identified needs. Participants recognized this potential, as well, with one participant noting in a follow-up email, "It's a good review of everything I think we should be using." In the open-ended response section, another respondent added:

> I think all the techniques in the survey are effective. I keep trying to incorporate them all at least part of the time and I'm getting better at it. There's never enough time to do everything I'd like to do with students.

Professional development for developmental educators that focuses on critically important instructional practices can lead to improved teaching and increased student success rates. Ultimately, success in developmental education is a matter of the personal success of individuals, families, and communities, and of economic success for the nation as a whole.

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APPENDICES

APPENDIX A: PIERCE SURVEY OF DEVELOPMENTAL EDUCATION INSTRUCTIONAL PRACTICES

In the first column, on a scale of 1 to 6, with 1 being "not at all effective" and 6 being "very effective," please rate each of the following statements in terms of how effective you believe the practice is. In the second column, with 1 being "not used at all" and 6 being "used very frequently," please indicate how often you employ the practice. For each statement, circle one effectiveness number and one practice number.

To foster student success, developmental educators must . . .

1. Incorporate affective development (student success skills, motivation, self-regulation, etc.) into classroom activities.
2. Thoroughly structure teaching and learning activities, with all requirements and standards clearly stated.
3. Relate the curriculum to "real world" applications.
4. Require students to master content before moving on to new concepts (mastery learning).
5. Provide frequent opportunities for students to demonstrate learning.
6. Provide frequent and timely feedback.
7. Use a variety of instructional methods (to accommodate diverse learning styles).
8. Employ active learning techniques.
9. Incorporate collaborative learning (group activities).
10. Integrate critical thinking skills into course instruction.
11. Integrate teaching of learning strategies into course instruction.
12. Accept responsibility for helping sustain and strengthen student motivation.
13. Create a supportive learning environment.
14. Foster student connections with the college community (e.g., use student names, contact them personally when they are absent, and invite them individually to attend office hours).
15. Use anonymous, ungraded classroom assessment techniques (e.g., one-minute papers). (Angelo and Cross, 1993).
16. Develop learning communities (groups of students taking two or more courses together).
17. Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).
18. Use technology as an instructional supplement (not as a primary instructional delivery system).

Please complete the following demographic profile by writing in your answer or placing an X in the appropriate box.

19. Subject area(s) taught (mark all that apply): writing □ reading □ math □ ESL/ESOL □ college success/study skills □ science □
20. I teach developmental education courses by choice: yes □ no □
21. Age on December 31, 2011: years _____
22. Sex: male □ female □
23. Race/Ethnicity (mark all that apply): Hispanic or Latino □ American Indian or Alaska Native □ Asian □ Black or African-American □ Native Hawaiian or Other Pacific Islander □ White □
24. Highest degree earned: _____
25. Highest degree(s) earned related to content area: _____
26. Attended Kellogg Institute (for the training and certification of developmental educators): yes □ no □

For the following questions, please answer with the total years at the end of the 2011-2012 academic year.

27. Number of years teaching the majority of your course load in developmental education: years _____
28. Number of years teaching college as a full-time community college faculty member or educational administrator: years _____
29. Number of years teaching college as a full-time four-year college faculty member or educational administrator: years _____
30. Number of years teaching college as an adjunct (not full-time) faculty member: years _____
31. Number of years teaching at the P-12 level (even if these years overlap with college teaching): years _____

32. Please add any other information or comments you would like to include.

APPENDIX B: PILOT SURVEY

The investigator first conducted a pilot study with the 2011 instructors and class members of the Kellogg Institute of the National Center of Developmental Education at Appalachian State University in Boone, North Carolina. This prestigious institute is a four-week residence program that includes graduate seminars on the history of developmental education, placement and assessment, designing learning environments, multiculturalism, leadership, academic support services, outcomes assessment, program evaluation, and current research, among other topics. Each year, up to 45 developmental education professionals from all over the country participate in this advanced training program. The Kellogg Institute confers a certification as developmental educators for its members after they complete the intensive residential courses and practicum.

For the pilot study, the group of recommended developmental education instructional practices was initially selected from the best practices as defined by Smittle (2003) and Boylan (2002). The survey asked respondents to rate practices in terms of effectiveness and frequency of practice. The survey also included demographic information on survey participants.

The pilot study included an invitation to complete the survey as well as arrangements to conduct focus groups and meet individually with experts in developmental education as well as in teaching and learning. With Institutional Review Board approval from Marshall University and permission from the Kellogg Institute, the co-investigator, herself a Kellogg participant, distributed a paper copy of the survey along with an anonymous consent form to other Kellogg participants during afternoon class

announcements on 28 June 2011. At this time, she explained the purpose of the study to fellow Kellogg participants and asked for their anonymous participation as expert developmental educators. She provided a large manila envelope marked "Returned Pierce Surveys" on a table in the back of the classroom, and she removed completed surveys each day from the envelope and stored them in a secure location. Kellogg participants were asked to return surveys within one week, but the deadline was later extended to 11 July 2011 due to expressed participant concerns with their class reading and work requirements as well as the planned Independence Day holiday activities.

Surveys were distributed to 39 of 41 total Kellogg participants; one participant was absent for the survey completion period, and the co-investigator was not eligible to complete a survey. The Kellogg participants included a mix of developmental educators such as faculty members who teach developmental math, reading, writing, ESL/ESOL, and study skills; deans, department chairs, and program directors with limited teaching responsibilities; and associated support services personnel such as writing center directors. A total of 27 surveys, or 69%, were returned. Several Kellogg participants remarked verbally to the co-investigator that since they did not teach, they had not completed the survey. Of the 27 surveys submitted, 1 had no ratings completed, and the respondent had noted, "*Not completing survey because I am not a faculty member & my institution does not offer developmental courses." This survey was not included in the results report, lowering the survey return rate to 26 surveys out of 39, or 67%.

The average age of the 26 respondents was 47.9 (range 31-62), with an average of 5.4 years teaching the majority of their course load in developmental education (range 0-20), 8.4 years teaching college as a full-time faculty member or educational administrator

(range 0-30), and 2.9 years teaching college as an adjunct faculty member (range 0-10). Of the responses on the demographic questions (6 participants chose not to respond), for race, 16 identified as Caucasian, 2 as African-American, 2 as Mexican-American/Hispanic, and 1 as Japanese. The participants included 6 males and 19 females. (One participant did not respond to any demographic items (32-41) or to items 26-31, as he/she did not turn over the survey and complete the back). The highest terminal degree for 7 respondents was a doctorate, while 18 participants listed a master's degree. In the content area taught, 4 respondents listed a doctorate, while 13 identified a master's degree; however, this question was clearly confusing to the survey sample, since 9 participants did not answer. (In contrast, only 1 participant failed to answer the question regarding terminal degree.) Survey respondents taught a variety of subjects, including reading, writing, math, ESL/ESOL, study skills, and other subjects. Many respondents taught in more than one area.

Respondents were asked to rate each survey item twice on a 5-point Likert scale (later modified to a 6-point scale in the survey revision), once for "its effectiveness" and once for "the frequency that you employ the practice." For the effectiveness rating, 5 was defined as "very effective," with 4 representing "moderately effective," 3 as "somewhat effective," 2 as "slightly effective," and 1 as "not at all effective." Average survey responses for effectiveness ranged from 4.88 on item 25 (receive training in teaching developmental education) to 3.84 on item 31 (employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace. Item 31 was the only item rated less than 4. These 2 survey items were also 2 of the 4 items with a practice

rating of at least 1 point (rounded to the first decimal point) lower than the effectiveness rating.

For the practice scale, rating 5 was defined as "used very frequently," with 4 representing "used moderately," 3 as "used somewhat," 2 as "used slightly," and 1 as "used not at all." The average survey responses for the practice scale varied from 4.80 on item 20 (recognize students as individuals and call them by name) to 2.74 on item 28 (develop learning communities (groups of students taking a set of courses together)). Two additional survey item averages were rated less than 3: item 29 (use supplemental instruction (additional practice performed by a tutor who also sits in on classes)) and item 31 (employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace. Along with item 25, items 28, 29, and 31 were the items with a practice rating of at least 1 point (rounded to the first decimal point) lower than the effectiveness rating. However, item 20 was the item with the average practice score closest in number to the effectiveness score (effectiveness 4.85 and practice 4.80).

A detailed tabulation of survey results is provided in Table 17, below. This table contains the average scores (rounded to two decimal places) for both effectiveness and practice for the Kellogg Institute pilot survey sample.

Table 17
Pilot Survey Response Means
N = 26

Survey Items	Effectiveness	Practice
1. Commit to teaching underprepared students.	4.81	4.54
2. Understand affective components (student success skills, motivation, self-regulation, etc.) of learning.	4.69	4.08
3. Hold the appropriate credential in order to teach the subject matter in various ways.	4.46	4.05
4. Thoroughly structure teaching and learning activities.	4.38	3.83
5. Articulate standards clearly.	4.76	4.33
6. Supervise student activities in class, in labs, and with	4.38	3.52

tutors in order to teach pacing skills.		
7. Relate the curriculum to the "real world" and to student interests.	4.73	4.16
8. Require students to master content before moving on.	4.38	3.88
9. Provide frequent testing opportunities.	4.52	4.04
10. Provide frequent and timely, if not immediate, feedback.	4.80	4.26
11. Accommodate diversity by using a variety of instructional methods to appeal to diverse learning styles.	4.73	4.33
12. Employ active learning techniques.	4.85	4.40
13. Incorporate cooperative learning.	4.58	4.04
14. Teach critical thinking skills.	4.85	4.24
15. Teach learning strategies.	4.73	4.28
16. Motivate students.	4.62	4.28
17. Assist students to set goals.	4.38	3.64
18. Create a supportive environment to enhance self-esteem.	4.69	4.24
19. Help students foster connections by contacting them personally when they are absent.	4.12	3.48
20. Recognize students as individuals and call them by name.	4.85	4.80
21. Invite students individually to attend office hours.	4.31	4.16
22. Prepare students for the next-level course by linking developmental content to college-level requirements.	4.85	4.44
23. Establish a classroom atmosphere of respect.	4.85	4.60
24. Engage in individual faculty professional development.	4.62	4.32
25. Receive training in teaching developmental education students.	4.88	3.92
26. Share instructional strategies with other developmental educators.	4.40	4.08
27. Use classroom assessment techniques.	4.52	3.75
28. Develop learning communities (groups of students taking a set of courses together).	4.28	2.74
29. Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).	4.13	2.91
30. Use technology in moderation as a supplement rather than as the primary instructional delivery system.	4.56	4.25
31. Employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace.	3.84	2.88

During the initial explanation of the study's purpose, the co-investigator had informed the Kellogg participants that they were welcome to write comments on the survey itself if they noticed an item that needed to be clarified or changed. Six participants did so. Many additional participants from the sample survey population of

Kellogg Institute participants annotated item 37, certified developmental educator (Kellogg graduate) by marking yes or no and including comments such as "1/2 way there," "hopefully," "not yet," "will be," and "in progress." Table 18, below, contains a summary of other survey-item related notations following the original survey item.

Table 18
Pilot Survey Comments

a. Practice column header
   Comment: "Some of these are my classroom practices & others are what my institution does or does not do."
1. Commit to teaching underprepared students.
   Comment: "The concept is not clear re: practice. Commit is also a problematic term as it is a range.
3. Hold the appropriate credential in order to teach the subject matter in various ways.
   Comment: "How is this employed in practice? I don't make hiring decisions."
4. Thoroughly structure teaching and learning activities.
   Comment: [the word "thoroughly" deleted and the word "structure" capitalized] "(Plan & teach w/ intention)"
10. Provide frequent and timely, if not immediate, feedback.
    Comment: "frequent, timely, and when possible, immediate feedback"
11. Accommodate diversity by using a variety of instructional methods to appeal to diverse learning styles.
    Comment: [inserted after the word "diversity"] "of learning preferences"
19. Help students foster connections by contacting them personally when they are absent.
    Comment: "Depends on the student."
25. Practice column rating
    Comment: [3] "lack of opportunity"
26. Share instructional strategies with other developmental educators.
    Comment: [written in blank space below item 31, but presumably related to this question] "sharing w/faculty who aren't interested isn't effective"
28. Develop learning communities (groups of students taking courses together).
    Comment: "Our institution does not do this."
29. Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).
    Comment: "Our institution does not do this."
31. Employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace.
    Comment: "not at our institution."
36. Highest degree(s) earned related to teaching load:
    Comment: "? – what does this mean?" (The respondent marked "M.S." for highest terminal degree earned, the previous item.)

39. Time teaching the majority of your full-time course load in developmental education:
    Comment: The phrase "teaching the majority of your full-time course load" is underlined, and the response to the item is 0; however, the respondent marked the next item "30+ years" teaching college as a full-time faculty member or educational administrator.
    Comment: [0 years] "generally ½ load"

Focus Groups

The co-investigator also scheduled a focus group and pizza dinner for interested Kellogg participants to be held on 14 July 2011 at 5:00 p.m. in the first floor lounge of Newland Residence Hall at Appalachian State University, posting a large sign-up sheet in the classroom and reminding Kellogg participants of the event with several verbal announcements and one written announcement by the Kellogg Director. However, when the class schedule was rearranged to accommodate a presenter, a group of scheduled focus group participants decided to participate in a recreational activity that was added.

At their request, the co-investigator scheduled an additional focus group that met on 13 July 2011, 11:55-12:40 p.m., during lunch, in Sanford Commons of the Central Dining Hall at Appalachian State University. The co-investigator welcomed participants and explained the purpose of the study, the survey instrument, and the pilot study.

The five participants in this early focus group, Focus Group One, included developmental faculty members in reading, writing, and math; a developmental education administrator; and an academic support director for developmental education. The participants expressed overall interest in the survey and satisfaction with its design, which one participant praised as "comprehensive" and another as "very thorough." Another general comment was that the effectiveness ratings were all a "no brainer;" that is, most developmental educators would mark every choice as a "5, very effective." One

participant suggested wording the items differently so that not all questions would be marked as "5" or "4." Other participants felt this type of re-wording was not necessary.

The group expressed enjoyment with discussing the survey, and an idea of meeting with first a group of developmental education faculty members, then a group of college-level faculty members in math and English, and finally a group of faculty members from a variety of disciplines generated a very animated discussion. In the context of discussing specific survey items, the participants also spoke with enthusiasm of their desire to hire developmental education faculty members with a "passion" for teaching developmental education students. One participant suggested adding additional survey items such as, "Invite student support services to visit the classroom."

Focus Group One recommended editing several survey items for clarity. Table 19, below, includes the text of specific survey items. Numerals correspond to those on the pilot survey instrument. The italicized portion of each survey item is followed with suggested changes, also in italics. The focus group concluded with expressions of thanks from the co-investigator for the many helpful comments and with a promise to share the completed instrument at a future date.

Table 19
Focus Group One Recommendations

1. *Commit to teaching* underprepared students.
   Suggestions: *willingly teach; have a passion for teaching; desire to teach*
2. *Understand* affective components (student success skills, motivation, self-regulation, etc.) of learning.
   Suggestion: *apply*
3. Hold the *appropriate credential* in order to teach the subject matter in various ways.
   Suggestion: *appropriate content credential*
5. Articulate *standards* clearly.
   Suggestion: *What standards? Be more specific.*
9. Provide frequent *testing* opportunities.
   Suggestion: *Clarify whether formative? Summative? Test/retest?*

10. *Provide frequent and timely, if not immediate, feedback.*
    Suggestion: *Provide immediate feedback.*
15. Teach *learning strategies*.
    Suggestion: *Possibly make this statement more specific.*
16. *Motivate* students.
    Suggestion: *Possibly clarify the type of motivation as positive, negative, intrinsic, or extrinsic.*
17. Assist students to set *goals*.
    Suggestion: *Possibly clarify the type of goals as personal, career, course-related, or study behavior.*
18. *Create a supportive environment to enhance self-esteem.*
    Suggestions: *Create a supportive learning environment. Create a supportive environment to enhance both affective and cognitive behavior.*
20. *Recognize students as individuals and call them by name.*
    Suggestion: *Possibly split this item into two separate items. Recognize students as individuals. (Some participants suggested omitting this part of the item entirely.) Learn and use students' names frequently.*
23. *Establish a classroom atmosphere of respect.*
    Suggestion: *This item is somewhat similar to #18. Possibly the two items should be combined.*
24. Engage in *individual* faculty professional development.
    Suggestion: *Clarify.*
25. Receive *training in teaching* developmental education students.
    Suggestions: *professional development in teaching; professional development in understanding*
26. *Share instructional strategies with other developmental educators.*
    Suggestions: *Meet with other developmental educators to determine consistent strategies for improvement. Meet with college-level educators to bridge content and skill gaps and determine strategies to address.*
30. *Use technology in moderation as a supplement rather than as the primary instructional delivery system.*
    Suggestion: *Use technology as a supplement to the primary instructional delivery system.*
31. *Employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace.*
    Suggestion: *Employ lab-based, self-paced learning techniques.*
33. Sex: □ *male* □ *female*
    Suggestion: □ *male* □ *female* □ *transgender*
34. *Race:*
    Suggestion: *Add check-boxes and race categories with the direction to check all that apply.*
35. *Highest terminal degree earned:*
    Suggestion: *Highest degree earned.*
36. Highest degree(s) earned related to *teaching load*:
    Suggestion: *content area*

The second, originally-scheduled focus group met and shared pizza on 14 July 2011 from 5:00 to 6:00 p.m. in the main lobby of Newland Residence Hall at Appalachian State University. The co-investigator welcomed the participants and explained the purpose of the study, the survey instrument, and the pilot study. The nine participants in Focus Group Two included developmental faculty members in reading, writing, math, adult education and ESL; developmental education administrators; and academic support staff.

This group began by praising the survey and its intent, and then they discussed the two categories of effectiveness and practice. The group was split on the discussion of whether to rename the "effectiveness" category "importance." One participant suggested further defining "effectiveness" in the survey directions to clarify whether the rating is related to the practice's effectiveness or the personal instructor's effectiveness when using the specific best practice. No other participants agreed that this change would be helpful. The participant also suggested adding the words "your opinion" to the directions, but other participants did not agree the addition was necessary. Another proposed modification to the survey directions was to change the word "must" in the sentence "To foster student success, developmental educators must . . ." to "should" or to eliminate it entirely.

While the participants all stated that they thought the two categories of "effectiveness" and "practice" were important, many of them thought the proximity of the two categories on the paper survey allowed participants to compare the two ratings and adjust scores accordingly so that the practice scores would be comparable to the effectiveness scores. That is, participants would rate practice higher because they would

perceive that if an item is an important best practice, then they should be using the technique in their own courses. One suggestion was to move the practice category rating so that it would be scored first. Another participant suggested leaving the categories in the same order but shading out the first answer in an online survey so that participants could not look back at their effectiveness answer before marking the practice answer. Several participants thought this idea would work well.

Focus Group Two considered most survey items in detail, making recommendations to clarify language on many items. Specific items this group edited are included in Table 20, below. Numerals correspond to those on the pilot survey instrument. The italicized portion of each survey item is followed with suggested changes, also in italics. In general, Focus Group Two stated that the survey instrument and process would be of great interest to developmental education practitioners and that the results should be shared at conferences and published in journals once the study has been completed.

Table 20
Focus Group Two Recommendations

1. *Commit to teaching* underprepared students.
   Suggestions: *choose to teach; want to teach*
3. Hold the *appropriate credential* in order to teach the subject matter in various ways.
   Suggestion: *What does this mean? This cannot be specifically defined because the appropriate credential for teaching developmental education courses differs with various accrediting bodies.*
6. *Supervise* student activities in class, in labs, and with tutors in order to *teach pacing skills*.
   Suggestion: *This question needs to be entirely rewritten. It seems to address more than one area, and the term "pacing skills" is not clear.*
9. *Provide* frequent *testing* opportunities.
   Suggestion: *Employ frequent opportunities for students to demonstrate learning.*
10. *Provide frequent and timely, if not immediate, feedback.*
    Suggestion: *Provide frequent and timely feedback.*
11. Accommodate diversity by using a variety of instructional methods to appeal to

diverse learning styles.
Suggestion: *Use a variety of instructional methods to accommodate different learning styles.*

17. *Assist* students to set *goals*.
Suggestion: *Help students set goals; Assist students in setting goals. Clarify what kind of goals.*
19. *Help students foster connections by contacting them personally when they are absent.*
Suggestions: *This item combines a broad practice with a specific example of the practice, so the item should be one of the following two options: Help students foster connections with the college community. Contact students personally when they are absent.*
22. *Prepare students for the next-level course by linking developmental content to college-level requirements.*
Suggestion: *Modify the question to express that this item reflects in-class discussion and activities rather than instructional design or syllabus-type linkage.*
23. Establish a classroom atmosphere *of respect.*
Suggestion: *of mutual respect.*
24. Engage in *individual* faculty professional development.
Suggestion: *self-directed*
25. *Receive* training in teaching *developmental education students*.
Suggestions: *Pursue training in teaching developmental education.*
29. *Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).*
Suggestions: *This technique is an institutional decision rather than a personal decision; it should possibly be omitted for that reason. Also, "supplemental instruction" is a copyrighted term.*
30. *Use technology in moderation as a supplement rather than as the primary instructional delivery system.*
Suggestion: *Use technology as an instructional supplement.*
31. *Employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace.*
Suggestion: *Provide lab-based learning opportunities to allow students to master content at their own pace.*
34. *Race*
Suggestions: *Race/Ethnicity. Add check-boxes and race categories. Use the categories listed in IPEDS, not those listed in the U.S. Census.*
35. *Highest terminal degree earned*
Suggestion: *Highest degree earned*
36. *Certified developmental educator (Kellogg graduate)*
Suggestion: *Attended Kellogg Institute for the Training and Certification of Developmental Educators*

Expert Recommendations

In addition to conducting the two focus groups, the co-investigator also met with two experts in the fields of developmental education and of teaching and learning while participating in the Kellogg Institute. The first meeting with Dr. Hunter Boylan, Director of the National Center of Developmental Education and Professor of Higher Education at Appalachian State University, took place 3:00-3:45 p.m. on 14 July 2011 in his office, 330B, in Edwin Duncan Hall at Appalachian State University. The co-investigator explained the purpose of the study and the purpose of the meeting—to discuss the relevance of the study and its design as well as the design of the survey instrument.

Dr. Boylan found the study topic to be relevant; however, he endorsed two additional resources in addition to *What Works* (Boylan, 2002) and "Principles for Effective Teaching" (Smittle, 2003). One resource, *Student Success in Community Colleges* (Boroch, Hope, Smith, Gabriner, Mery, Johnstone, and Asera, 2010), the work of the California Basic Skills Initiative, is recommended reading for the Kellogg Institute. During a discussion with the co-investigator of whether to include or delete specific survey items, Boylan suggested triangulating various sources of best teaching practices and focusing on those that appear in more than one source. At the conclusion of the meeting, he escorted the co-investigator to the *Journal of Developmental Education* office, introduced her to the editor, Barbara Calderwood, and provided a copy of the issue that includes a recommended article, "Reading and Learning Strategies: Recommendations for the 21st Century" (Simpson, Stahl, and Francis, 2004). Boylan noted that the article revisits and updates recommendations made 10 years earlier and that like most developmental education teaching practices, it is widely applicable to all the

content areas taught in developmental education, even though reading is the content area mentioned.

Boylan also commented upon specific survey items. These are included in Table 21, below. Numerals correspond to those on the pilot survey instrument. The italicized portion of each survey item is followed with suggested changes, also in italics. Boylan confirmed that the methodology of the study is sound. He summarized his survey-related recommendations at the conclusion of the meeting with the co-investigator as follows: 1.) select survey items as a result of triangulation, and 2.) include (general) teaching practices rather than specific methods. Boylan also noted that collecting information from survey participants as to number of credit hours taught in a typical semester could yield interesting information for analysis.

Table 21
Hunter Boylan Recommendations

1. *Commit to teaching underprepared students.*
   Suggestion: *Choose to teach developmental education courses.*
2. *Incorporate affective components (student success skills, motivation, self-regulation, etc.) of learning.*
   Suggestion: *Incorporate affective development (student success skills, motivation, self-regulation, etc.) into classroom activities.*
3. Hold the *appropriate credential in order* to teach the subject matter in various ways.
   Suggestion: *sufficient depth of knowledge*
5. Articulate *standards* clearly.
   Suggestion: *course expectations*
6. *Supervise student activities in class, in labs, and with tutors in order to teach pacing skills*.
   Suggestion: *This survey item is "not a very high-value target" and should be omitted. In general, survey items that appear in the best practices literature only once should be eliminated.*
7. *Relate the curriculum to the "real world" and to student interests.*
   Suggestion: *"real world applications" (Also, this survey item is really two different items.)*
8. *Require students to master content before moving on.*
   Suggestion: *This survey item addresses mastery learning, and as such, overlaps with item 31.*

10. Provide *frequent and timely, if not immediate,* feedback.
    Suggestion: *immediate*
11. *Accommodate diversity by using a variety of instructional methods to appeal to diverse learning styles.*
    Suggestions: *Accommodate diversity by using a variety of instructional methods; Use a variety of instructional methods.*
13. Incorporate *cooperative learning.*
    Suggestion: *group activities (Cooperative learning has a distinctive meaning for educators who have worked in the K-12 system.)*
14. *Teach critical thinking skills.*
    Suggestion: *Is this item an overlap with #15?*
15. *Teach learning strategies.*
    Suggestion: *Is this item an overlap with #14?*
16. *Motivate students.*
    Suggestion: *Accept responsibility for motivating students.*
17. Assist students to set *goals*.
    Suggestion: *goals for coursework? (Clarify what kind of goals.)*
18. Create a supportive *environment to enhance self-esteem.*
    Suggestion: *environment*
19. *Help students foster connections by contacting them personally when they are absent.*
    Suggestion: *Establish a sense of community in the classroom. (This item combines a broad practice with a specific example of the practice.)*
20. *Recognize students as individuals and call them by name.*
    Suggestion: *Know and use student names.*
21. Invite *students individually* to attend office hours.
    Suggestion: *individual students*
22. *Prepare students for the next-level course by linking developmental content to college-level requirements.*
    Suggestions: *Link developmental content to college-level requirements; Teach students to see the relationship between developmental and college-level content.*
24. *Engage in individual faculty professional development.*
    Suggestion: *Remain current with research literature.*
25. *Receive training* in teaching developmental education students.
    Suggestion: *Participate in training*
27. Use classroom assessment techniques.
    Suggestion: *Add a definition similar to those that appear in survey items #28 and #29; educators who have worked in the K-12 system use this term differently.*
29. Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).
    Suggestion: The use of this survey item is problematic, and it should possibly be omitted. Supplemental instruction is a very narrowly defined term.
31. *Employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace.*
    Suggestion: *Employ mastery learning techniques.*

The co-investigator also met with Dr. Barbara Bonham, Senior Researcher at the National Center for Developmental Education (NCDE) and Professor in the Department of Leadership and Higher Education at Appalachian State University, 7:00-7:40 p.m. in the main lobby of Newland Residence Hall at Appalachian State University. Dr. Bonham brought along a friend and former NCDE research fellow, Leah Thompson, who observed the meeting. The co-investigator explained the purpose of the study and the purpose of the meeting—to discuss the relevance of the study and its design as well as the design of the survey instrument.

Bonham expressed enthusiasm for the idea of using the survey instrument as an educational tool for faculty members; in fact, she noted that the survey is a good length, short enough so that it could also be completed by busy administrators, legislators, and similar stakeholders. The act of completing the survey would be a learning experience to promote awareness of best practices, especially if references to recommended websites and resources are later linked with specific survey items. Bonham added that the survey could also be a means to "promote and encourage faculty to get together and talk about teaching and learning" at a particular institution. It could also be used as a tool to help faculty members choose professional development topics after selecting three or four areas where they rated their practice as "1, not used at all" or "2, used slightly" but rated the practice's effectiveness as high. Bonham suggested that study results should be widely disseminated at conferences and shared in research literature.

Like Boylan, Bonham recommended that the survey incorporate best practices from additional sources. Her first recommendation was *Student Success in Community Colleges* (Boroch et al, 2010). Also, noting that best practices are generally similar

across content areas, she proposed several math-related publications: "Best Practices in Developmental Math, Volume 1" (NADE Math SPIN, 2002), "Best Practices in Developmental Math , Volume 2" (NADE Math SPIN, 2003), "Massachusetts Community Colleges Developmental Education Best Policy and Practice Audit" (Sperling, 2009), and "100% Math Initiative" (Massachusetts Community Colleges, 2006).

Bonham also made specific suggestions about several survey items. These are included in Table 22, below. Numerals correspond to those on the pilot survey instrument. The italicized portion of each survey item is followed with suggested changes, also in italics. Dr. Bonham also suggested the addition of a demographic item, "number of years teaching."

Table 22
Barbara Bonham Recommendations

8. *Require students to master content before moving on.*
   Suggestion: *8. Require students to master content before moving on (mastery learning).*
14. *Teach critical thinking skills.*
   Suggestion: *Integrate critical thinking skills into course instruction.*
15. *Teach learning strategies.*
   Suggestion: *Integrate teaching of learning strategies into course instruction.*
19. *Help students foster connections by contacting them personally when they are absent.*
   Suggestion: *Help students foster connections (e.g., by contacting them personally when they are absent).*
27. *Use classroom assessment techniques.*
   Suggestion: *Use anonymous, ungraded classroom assessment techniques (e.g., one-minute papers) (Angelo and Cross, 1993). Watch for buzzwords in these and similar survey items.*
28. Develop learning communities (groups of students taking *a set of* courses together).
   Suggestion: *two or more*
31. Employ lab-based, self-paced mastery learning techniques to allow students to learn at their own pace.
   Suggestion: *Employ individualized instruction. (The wording of the survey item is problematic in that it might be interpreted as the emporium model as it is*

stated.)
35. Highest *terminal degree* earned.
    Suggestion: *degree* earned

A discussion followed with Bonham and Thompson inquiring about the population included in the study of faculty perceptions of best teaching practices. Bonham noted that the study should be later applied to additional geographic areas and analyzed for regional differences. Thompson volunteered to administer a revised pilot survey with developmental education colleagues in Washington state, and Bonham offered to pilot a revised survey instrument with the students in her higher education courses. The meeting concluded with a promise from the co-investigator to share research progress.

Based upon the pilot survey, focus group, and expert recommendations, the survey items were revised prior to triangulation with additional sources. Table 23, below, contains the revised survey based upon the pilot study.

Table 23
Preliminary Survey Revision

To foster student success, developmental educators must . . .
1. Choose to teach developmental education courses.
2. Incorporate affective development (student success skills, motivation, self-regulation, etc.) into classroom activities.
3. Hold sufficient depth of content knowledge in order to teach the subject matter in various ways.
4. Plan teaching and learning activities.
5. Articulate course expectations clearly.
6. Delete.
7. Relate the curriculum to "real world" applications. Relate the curriculum to student interests.
8. Require students to master content before moving on (mastery learning).
9. Provide frequent opportunities for students to demonstrate learning.
10. Provide immediate feedback.
11. Use a variety of instructional methods (to accommodate diverse learning styles).
12. Employ active learning techniques.
13. Incorporate collaborative learning (group activities).

14. Integrate critical thinking skills into course instruction.
15. Integrate teaching of learning strategies into course instruction.
16. Accept responsibility for motivating students.
17. Assist students in setting course-related goals.
18. Create a supportive learning environment.
19. Foster student connections with the college community (e.g., contact them personally when they are absent).
20. Use individual student names.
21. Invite individual students to attend office hours.
22. Explain the relationship to college-level requirements when teaching students developmental course content.
23. Establish a classroom atmosphere of mutual respect.
24. Engage in self-directed faculty professional development (e.g., remain current with research literature).
25. Pursue training in teaching developmental education students.
26. Share instructional strategies with other developmental educators.
27. Use anonymous, ungraded classroom assessment techniques (e.g., one-minute papers). (Angelo and Cross, 1993).
28. Develop learning communities (groups of students taking two or more courses together).
29. Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).
30. Use technology as an instructional supplement.
31. Employ individualized instruction.
32. Age on December 31, 2011: years _____
33. Sex: male □ female □
34. Race/Ethnicity (mark all that apply): Hispanic or Latino □ American Indian or Alaska Native □ Asian □ Black or African-American □ Native Hawaiian or Other Pacific Islander □ White □
35. Highest degree earned: _____
36. Highest degree(s) earned related to content area: _____
37. Attended Kellogg Institute (for the training and certification of developmental educators): yes □ no □
38. Subject area(s) taught (mark all that apply): writing □ reading □ math □ ESL/ESOL □ college success/study skills □ science □
39. Number of years teaching the majority of your course load in developmental education (at the end of the 2011-2012 academic year): years _____
40. Number of years teaching college as a full-time faculty member or educational administrator (at the end of the 2011-2012 academic year): years _____
41. Total number of years teaching college (at the end of the 2011-2012 academic year, including teaching as an adjunct faculty member): years _____
Total number of years teaching at the P-12 level: years _____

Survey Instrument

After revising the survey according to input from Kellogg Institute participants, best teaching practices were examined from several additional sources, each of them individually, like the recommendations of Smittle and Boylan, an analysis of a wide assortment of literature on the topic. These additional sources include Simpson, Stahl, and Francis (2004); the Massachusetts Community Colleges Executive Office (2006) and Sperling (2009); and the California Community College Basic Skills Initiative (Boroch et al, 2010). Triangulation of revised non-demographic survey questions with these additional sources revealed that a few teaching practices were emphasized by only one of the five resources; these items were eliminated. Table 24, below, displays the results of revised survey item triangulation.

Table 24
Survey Triangulation with Additional Sources

	Smittle	Boylan	Simpson et al	Boroch et al	Massachusetts
1. Omitted					
2. Incorporate affective development (student success skills, motivation, self-regulation, etc.) into classroom activities.	X		X	X	X
3. Omitted					
4. Thoroughly structure teaching and learning activities, with all requirements and standards clearly stated.	X			X	X
5. Articulate course expectations clearly.	X				
6. Relate the curriculum to "real world" applications.	X		X	X	X
7. Relate the curriculum to student interests.	X				
8. Require students to master content before moving on to new concepts (mastery learning).	X	X			
9. Provide frequent opportunities for students to demonstrate learning.		X	X	X	
10. Provide frequent and timely feedback.	X	X	X		

11. Use a variety of instructional methods (to accommodate diverse learning styles).	X	X	X	X	X
12. Employ active learning techniques.	X	X	X	X	X
13. Incorporate collaborative learning (group activities).	X			X	X
14. Integrate critical thinking skills into course instruction.		X	X	X	X
15. Integrate teaching of learning strategies into course instruction.		X	X	X	X
16. Accept responsibility for helping sustain and strengthen student motivation.	X			X	X
17. Assist students in setting short-term and long-term goals.	X				
18. Create a supportive learning environment.	X			X	
19. Foster student connections with the college community (e.g., use student names, contact them personally when they are absent, invite them individually to attend office hours).	X			X	
20-26. Omitted.					
27. Use anonymous, ungraded classroom assessment techniques (e.g., one-minute papers). (Angelo and Cross, 1993).		X	X		
28. Develop learning communities (groups of students taking two or more courses together).		X		X	X
29. Use supplemental instruction (additional practice performed by a tutor who also sits in on classes).		X		X	X
30. Use technology as an instructional supplement (not as a primary instructional delivery system).		X		X	X
31. Employ individualized instruction.				X	
32-40. Omitted.					

The final survey instrument with all changes reflected includes 18 recommended practice items, each to receive separate ratings for effectiveness and practice (dependent variables), and 13 demographic items (independent variables), as well as an open-ended question to allow for further comments. The survey instrument appears in Appendix A.

APPENDIX C: INSTITUTIONAL REVIEW BOARD APPROVAL

Office of Research Integrity
Institutional Review Board
401 11th St., Suite 1300
Huntington, WV 25701

FWA 00002704

IRB1 #00002205
IRB2 #00003206

May 2, 2012

Dennis Anderson, Ed.D.
Leadership Studies

RE: IRBNet ID# 334071-1
At: Marshall University Institutional Review Board #2 (Social/Behavioral)

Dear Dr. Anderson:

Protocol Title:	[334071-1] Best Instructional Practices in Developmental Education	
Expiration Date:	May 2, 2013	
Site Location:	MUGC	
Submission Type:	New Project	APPROVED
Review Type:	Exempt Review	

In accordance with 45CFR46.101(b)(2), the above study and informed consent were granted Exempted approval today by the Marshall University Institutional Review Board #2 (Social/Behavioral) Designee for the period of 12 months. The approval will expire May 2, 2013. A continuing review request for this study must be submitted no later than 30 days prior to the expiration date.

This study is for student Calisa A Price.

If you have any questions, please contact the Marshall University Institutional Review Board #2 (Social/Behavioral) Coordinator Michelle Woomer, B.A., M.S at (304) 696-4308 or woomer3@marshall.edu. Please include your study title and reference number in all correspondence with this office.

CURRICULUM VITAE
CALISA A. PIERCE

EDUCATION

Marshall University
Doctor of Education in Educational Leadership, 2012
Education Specialist in Educational Leadership, 2003
Master of Arts in English, 1996
Bachelor of Arts in English, 1983

CERTIFICATION

Kellogg Institute for the Training and Certification of Developmental Educators, National Center for Developmental Education, Appalachian State University, Developmental Education Specialist, 2012

PROFESSIONAL EXPERIENCE

2011-Present	Dean of Developmental Education, Kanawha Valley Community and Technical College, South Charleston, West Virginia
1998-2010	Chair of Transitional Studies Department, Southern West Virginia Community and Technical College, Logan, West Virginia
2004-2007	Director of Adult Experiential Learning, Southern West Virginia Community and Technical College, Logan, West Virginia (concurrent position)
1993-1998	Adjunct Faculty Member, Southern West Virginia Community and Technical College, Logan, West Virginia

HONORS AND RECOGNITION

2012	Great Teachers Seminar
2012	Deans Appreciation Award
2012	Power of Team Award
2011	Complete College America West Virginia Team
2001	President's Award for Institutional Service
1995	Adjunct Faculty Teaching Excellence Award