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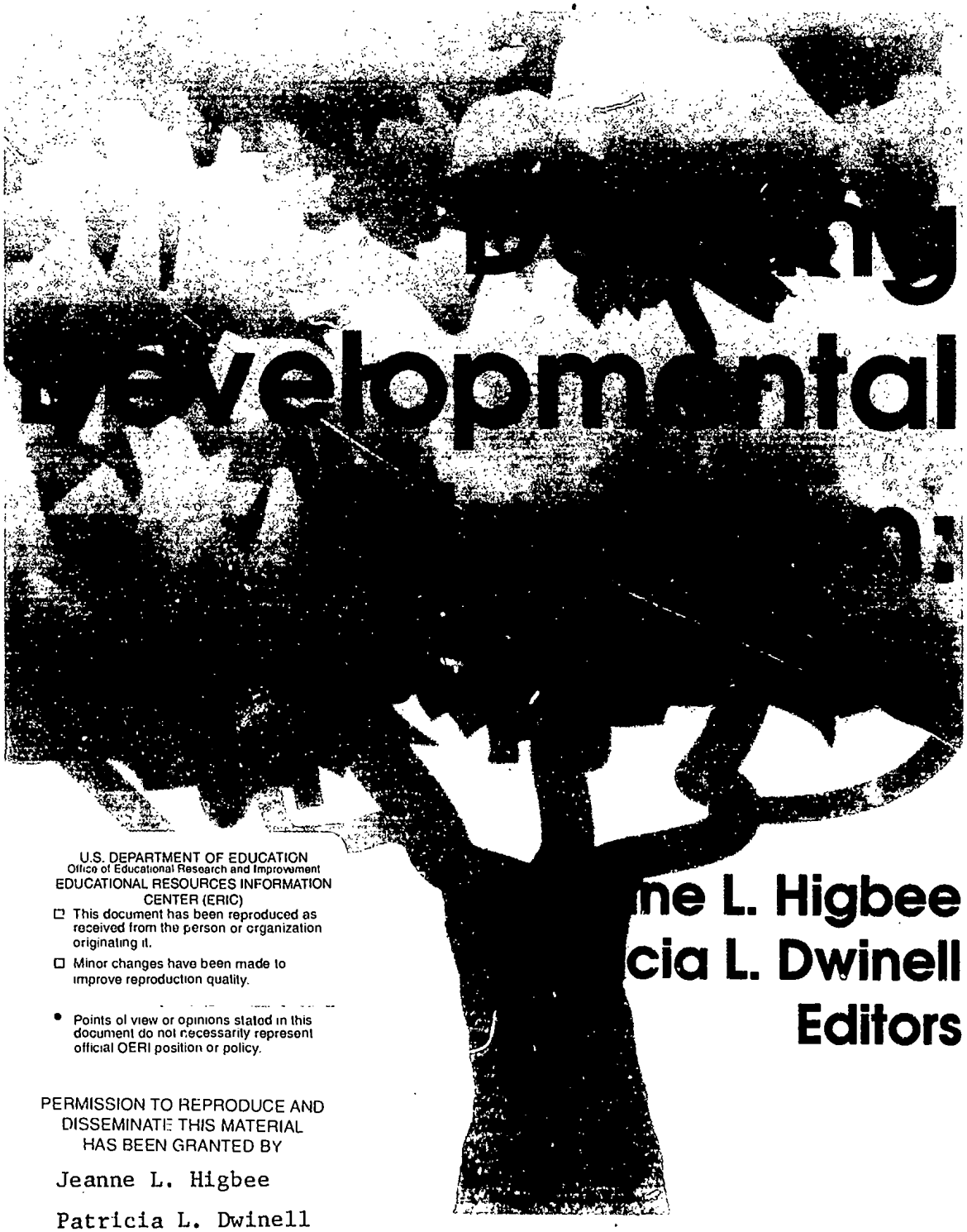
ABSTRACT

This monograph presents seven papers on the research, and pedagogical aspects of developmental education and implications for a definition of developmental education. After an introductory paper by the editors, the papers are: (1) "The New Science: Connections with Developmental Education" (Dana D. Darby); (2) "Issues Affecting the Definition of Developmental Education" (Emily Miller Payne and Barbara G. Lyman); (3) "Enhancing Education Through Cooperative Learning" (Eleanor Myers); (4) "Effects of Learning Support on College Algebra" (Cheryl B. Stratton); (5) "Foundation for A Constructivist, Whole Language Approach to Developmental College Reading" (David C. Caverly and Cynthia L. Peterson); (6) "The Educational Experience of Nontraditional Age Female African American Students" (Sandra Karnei Chumchal); and (7) "Defining Developmental Education: A Commentary" (Jeanne L. Higbee). (Individual papers contain references.) (NAV)



Developmental

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ne L. Higbee
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Editors

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Preface

It is with great pride that I write the preface for the inaugural issue of the NADE Monograph. I praise the vision and efforts of its editors who recognize the need for expanded publishing opportunities for professional developmental educators researching and writing about developmental education theory and pedagogy.

It is with equal pride that I introduce the theme of this first issue: "Defining Developmental Education: Theory, Research, and Pedagogy." Indeed, the theme of defining the field and profession of developmental education is one close to my heart. It represents a personal quest, shared by many of the developmental education cohort, to clearly and conclusively define what developmental education is, why it exists, and what are its goals.

This is an identity quest. This is a matter of focus. We developmental educators must know who we are and what we are about in order to progress, empowered by our mission to serve students, in straight-line fashion toward the accomplishment of the noble goals of our field. Accordingly, I predict this particular edition of the NADE Monograph will become regarded as both a handbook and guidebook for developmental educators, a standard. Because the need to define and redefine is always with us, the writings in this publication will be visited and cited often, given the need for us to re-center and regenerate.

"Know thyself." According to Plato, this phrase was inscribed on the temple at Delphi as one of the world's fundamental pieces of knowledge. Knowing ourselves is the fundamental purpose of these writings and this publication. We will all benefit from the wisdom that lies here within. Read, think, grow, and share.

Gene Beckett
Developmental Educator
NADE President, 1995-96

Introduction

Jeanne L. Higbee & Patricia L. Dwinell
Editors

Gene Beckett, President of the National Association for Developmental Education for 1995-96, established the goal of defining the mission of developmental education. Each article in this monograph reflects the authors' unique interpretations of its theme, "Defining Developmental Education: Theory, Research, and Pedagogy.

In "The New Science: Connections with Developmental Education," Dana Darby sets a forward-looking tone for the monograph as a whole. Darby suggests that developmental educators examine the dynamic complexity of our field. Like other authors who perceive the importance of access to higher education, she encourages us to value diversity. She reminds us to view the current state of disequilibrium in our profession as an opportunity for growth; the potential can be inspirational. She further instructs us "to consider our system holistically and to recognize the interconnected nature of all the components." This holistic approach must extend beyond curricular considerations to research. We agree with Darby that "it is intriguing to reflect on how new directions in our profession parallel the new science and changes in our society as a whole." Finally, Darby's reference to the Butterfly Effect should serve to reaffirm our sense of purpose. The ways in which we touch students' lives may have a far greater effect than we can imagine.

Emily Payne and Barbara Lyman provide the monograph's historical perspective. In "Issues Affecting the Definition of Developmental Education," they delineate academic, economic, and social issues as well as addressing the importance of evaluation as a means of accountability. They assert that our profession has in many ways been defined by the expectations of others, rather than by our own endeavors to come to an agreement regarding our mission. Attitudes toward developmental education have changed as the emphasis in education appears to have shifted from access to excellence. The fate of our profession may depend on our ability to educate a variety of constituencies, including legislators, parents, and the public as a whole, regarding

the long-term value of developmental education in achieving educational excellence and preparing America's diverse population to reclaim the lead in fields like mathematics, technology, and scientific research.

In "Enhancing Education through Cooperative Learning," Eleanor Myers challenges us to think more creatively about how to achieve excellence in teaching. Her thorough summary of theory and research on cooperative learning encourages us to reconsider our role in the teaching process. Not only do many students learn more effectively when learning cooperatively, they gain other benefits as well. Cooperative learning can assist in developing students to their greatest potential by enhancing self-esteem, internal locus of control, critical thinking and problem solving, altruism, conflict resolution, interpersonal communication, and acceptance of individual differences. Furthermore, collaboration promotes an active role in the learning process by shifting greater responsibility from the teacher to the students.

Cooperative learning is but one of the strategies included in Cheryl Stratton's co-requisite course for college algebra. In "Effects of Learning Support on College Algebra," Stratton reports her findings from a research study investigating the value of a learning support course paired to two specific sections of college algebra, both taught by the same instructor. Stratton's course focused on the process of learning, study skills specific to mastering mathematics, and the use of technology. During the last decade the mission of many developmental education programs has been expanded to include teaching co-requisite, adjunct, and supplemental instruction courses or seminars. Regardless of what titles various states or institutions choose to label these programs: learning support, academic assistance, or developmental studies, it is clear that some educators and policy makers are beginning to envision a greater role for professionals who excel in teaching and developing student talent. There is also growing acceptance for the notion that many highly qualified students may be at risk in specific subject areas, such as mathematics. The scope of developmental education need not be limited to teaching courses for specially admitted high risk students.

David Caverly and Cynthia Peterson consider "developmental not remedial" a guiding tenet of a constructivist, whole language philosophy, and encourage collaborative learning. The other guiding tenets described in "Foundations for a Constructivist, Whole Language Approach to Developmental College Reading" are that reading strategies are internal, that scaffolds provide the support students need as they develop strategies, and that students learn to exert control in the learning environment. The whole purpose of this approach is to guide students until they have developed the skills to guide themselves.

Sandra Chumchal's "The Educational Experience of Nontraditional Age Female African American Students" defines the role developmental education can play in providing educational opportunities for students returning to school after a gap. Chumchal describes these women's motivation to return to what initially seems to be an insurmountable challenge, and then to persist despite experiencing discrimination and other obstacles. She also chronicles their movement toward self-reliance while remaining nurturing to others.

Although representing three different disciplines within the field of developmental education, the writing of Stratton, Caverly and Peterson, and Chumchal share common threads: (a) developmental education professionals should perceive their mission as developing student potential; (b) developmental educators must concern themselves with student retention; (c) theory and research should serve as the foundation for pedagogy; (d) we must explore new and creative ways of teaching to meet student needs; and (e) we must provide a support network for students who are facing new and often difficult challenges as they pursue postsecondary education.

We hope the essays included in this monograph will stimulate discussion regarding the mission of developmental education and how each of us can contribute to achieving educational excellence within that mission. We would like to thank Gene Beckett and the 1995-96 NADE Executive Board for their support of this project. We would also like to express our appreciation to the authors, the editorial board, and to Betty Davis and Thomas Couillard for their editorial and technical support.

The New Science: Connections with Developmental Education

Dana D. Darby
Western Oklahoma State College

Chaos and complexity theories have rocked the scientific community and dislodged deeply embedded Newtonian values that have for centuries been the bedrock of philosophical views in many different disciplines: economics, psychology, education and others. Newtonian physics embraces cause-and-effect relationships, linearity, prediction, and control, concepts that have been adopted by researchers, teachers, and learners in investigating and interpreting the world in which we live. The problem has been that our theories and predictions never seem to match exactly with the realities we experience, so we continue to strive toward the formula" that will allow us to predict outcomes or methods and hence master the uncertain. The new science, however, provides an alternative paradigm from which we can view our experiences and make sense of them. Just as chaos and complexity have had a tremendous impact on the physical science community, so they are creeping into social science, business, and communications. The implications for research and practice in education are numerous. The purpose of this paper is to initiate a discussion on the relationship between the new science and developmental education.

Consider Margaret Wheatley's (1992) description of Newtonian images of the universe:

> We manage by separating things into parts, we believe that influence occurs as a direct result of force exerted from one person to another, we engage in complex planning for a world that

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> we keep expecting to be predictable, and we search continually for better methods of objectively perceiving the world (p. 6).

While these images are probably very familiar to us and probably very comfortable, they do not appropriately describe the complicated world in which those of us involved in developmental education find ourselves. Increasingly we are faced with a diverse student population and a rapidly changing educational context that emphatically point to the inadequacy of simplistic, disjointed efforts to prepare underprepared students. The new science will not provide hard and fast answers to the challenges we face; it will, however, give us a theoretical and philosophical framework that is more consistent with our experiences.

The new science focuses on open, dynamic systems and the behavior produced in such systems. Open systems "have to maintain a continuous exchange of energy and matter with their environment to stay alive" (Capra, 1983, p. 270). The behavior produced in such systems at times settles down to a steady state but, at other times becomes wildly turbulent. These systems are highly sensitive to initial conditions; small changes in these conditions might have only a small effect. Sometimes, though, small changes can cascade through a system and all possibility of predicting specific outcomes vanishes. Probably the most famous example of this is the Butterfly Effect— "the notion that a butterfly stirring the air today in Peking can transform storm systems next month in New York" (Gleick, 1987, p. 8). Edward Lorenz' weather simulation went dramatically askew after he entered into his computer the value .506 rather than .506127. He made the assumption that such a tiny difference was inconsequential, but after a few iterations, the difference was remarkable (Gleick, 1987). When results are fed back on themselves in a nonlinear system such as the weather, the direction taken by the system can be very surprising. "The proverbial straw that broke the camel's back is one familiar example of non-linearity: A very small change had an impact far beyond what could have been predicted" (Wheatley, 1992, p. 125).

Prediction within the realm of developmental education has been tenuous at best. College and government officials could not have predicted the incredible effect of opening access to higher education. In 1970, the City University of New York's rapid response to the challenge of open access resulted in an increase from the previous year of 35,000 students, a 75 % increase, and the majority of these students would not have been admitted under traditional university criteria (Donovan, 1985). Many other institutions soon dealt with similar issues. Now, in 1996, we can look back and see how the open access policy, in combination with political, social, and economic forces, has created the incredible diversity that is both a source of frustration and a source of renewal.

More subtle illustrations are abundant, such as the nonlinearity of the classroom. Students constitute nonlinear or open systems both as a group and as individuals. Initial conditions in student background, personal characteristics, and readiness to learn have the potential to impact student learning far beyond what we might expect. Slight variations in group make-up, in teaching styles, in learning styles, in classroom temperature and arrangement, in textbooks, in software, ad infinitum, can be greatly magnified as they flow through the system. Many instructors have had the experience of teaching similar content and using similar teaching styles, yet having very different outcomes. The complexity of the classroom simply defies accurate prediction.

Responding to Complexity

Waldrop (1992) states that "a system is complex, in the sense that a great many independent agents are interacting with each other in a great many ways" (p. 11). He further states that "except for the very simplest physical systems, virtually everything and everybody in the world is caught up in a vast, nonlinear web of incentives and constraints and connections. The slightest change in one place causes tremors everywhere else" (p. 65).

How do we as developmental educators respond to such complexity? The process has already been initiated simply by recognizing the diversity and complexity; in fact, Richardson and Elliott (1994) suggest that using the term "diverse" rather than "underprepared" is actually more descriptive of community college students. Roueche and Roueche (1993) acknowledge that poor academic skills are not the only issue facing these students.

> These same students also bring an amazing constellation of other needs and demands on their time that further negates their chances for academic success. Among these are economic instability, family responsibilities, and increased hours of and demands from outside employment (p. 14).

Faculty and administrators must at some point not only recognize the diversity, but also begin to value it, not merely seeing it as a barrier to equilibrium; indeed, a system in equilibrium eventually dies because it loses its ability to respond to changes in the environment. John Holland, of the Sante Fe Institute, refers to complex systems as "complex adaptive systems" (Waldrop, 1992, p. 145). Each of these systems has many agents acting in parallel, constantly organizing and reorganizing themselves so that new opportunities are always being created. They are reacting to one another so that the environment is never fixed, somewhat like never being able to step in the same river twice. It is therefore "essentially meaningless to talk about a complex adaptive system being in equilibrium.... If the system ever does reach equilibrium, it isn't just stable. It's dead.... In short, complex adaptive systems are characterized by perpetual novelty" (p. 147). For developmental education, diversity is a source of novelty and should be viewed as a catalyst to system renewal and transcendence. Health in a system comes through the processes of self-renewal, healing, homeostasis, and adaptation. When systems learn, develop, and evolve, they transcend what they were before and operate at a higher level (Capra, 1983).

In this vein, Sawada and Caley (1985) address the metaphor of dissipative structures in education. With respect to their environment, open systems can exist in three states: (a) at equilibrium, (b) near-equilibrium, and (c) far-from-equilibrium. "When systems approach the far-from-equilibrium state..., they are subject to spontaneous, dramatic reorganizations of matter and energy. Systems capable of this kind of reorganization are called dissipative structures" (p. 14). Though dissipation is usually associated with loss of energy, the alternative idea of dissipation shows that it can lead to new form in a system. "[Dissipation] was part of the process by which the system let go of its present form so that it could reemerge in a form better suited to the demands of the present environment" (Wheatley, 1992, p. 19). As diversity increases and students continue to demand quality, accessible programs, developmental education will remain in

a far-from-equilibrium state. We must recognize, however, the potential this invokes and remember that "growth is found in disequilibrium, not in balance" (Wheatley, 1992, p. 20).

Computer-generated images of strange attractors such as the "Lorenz attractor" (Gleick, 1987, p. 28) or the "three-winged bird" (Wheatley, 1992, p. 79) are somewhat the trademarks of the new science. These images trace the path of a dynamic system in phase space, reminding us of the order underlying such systems. The next point to be plotted cannot be predicted, yet the system never leaves certain boundaries. Some systems are indeed attracted to a single point and some are completely random, but the systems that lie in between these two extremes are the truly interesting ones. This middle ground is where we find developmental education. If we could trace a path for our system, we would certainly never converge on a single point. But neither would we see an indiscriminate splash of points. A pattern would surely emerge that reflects our inability to predict specific outcomes, but that also reflects the social, psychological, and philosophical boundaries that we shape and that in turn shape us. The impact this should have on the dynamic system of developmental education is to encourage us to consider our system holistically and to recognize the interconnected nature of all the components.

In 1988, the Commission on the Future of Community Colleges attempted to do just that with its report, Building Communities: A Vision for a New Century. "The building of community, in its broadest and best sense, encompasses a concern for the whole, for integration and collaboration, for openness and integrity, for inclusiveness and self-renewal" (p. 7). The commission not only considered connections within the classroom, but also the college as a whole, the curriculum, and even beyond the college. The ideal of community, with its underlying theme of relationship and connection, is exhibited in the learning organizations (Senge, 1990) that have become popular in business and industry. Similar ideas are being explored for learning communities in education. Matthews (1994) describes three different approaches to developing learning communities: (a) linked or paired courses, (b) course clusters, and (c) coordinated studies. She states:

> learning communities...consciously link different contents. The sense of purpose they encourage in students and faculty, and the continuity and integration they encourage in the curriculum, therefore address... how to provide coherence in a curriculum that often consists of disparate elements" (pp. 184-185).

Not only is it important to address the curriculum in a holistic manner, it is imperative to consider the student and all he or she brings to the educational setting. Roueche and Roueche (1993) suggest a holistic approach to retention by utilizing a variety of approaches to meet the needs of students, "any one of which if left unmet could spell academic disaster" (p. 16). Higbee, Dwinell, McAdams, GoldbergBelle, and Tardola (1991) suggest the importance of meeting the affective as well as cognitive needs of underprepared students, whether through existing services or through separate services.

The new science has implications not only for how we approach program development and teaching and learning, it also has a great deal to say about how we conduct research within this paradigm. Brian Arthur, of the Santa Fe Institute, says that "if you have a truly complex system,...then the exact patterns are not repeatable. And yet there are themes that are recognizable.

In history, for example, you can talk about 'revolutions,' even though one revolution might be quite different from another" (Waldrop, 1992, p. 334). Prediction becomes less an issue while explanation and description become paramount.

Complexity theorists utilize the ecosystem as a powerful metaphor, and this introduces further implications for research. Organisms continually adapt to one another, and each one's ability to survive depends on its history, what other organisms are present, and available resources. "Organisms in an ecosystem don't just evolve, they coevolve" (Waldrop, 1992, p. 259). Just as in an ecosystem we cannot accurately consider an organism in isolation, so we destroy systematic properties of educational contexts when we dissect them into isolated elements. "Although we can discern individual parts in any system, the nature of the whole is always different from the mere sum of its parts" (Capra, 1983, p. 267). The new science emphasizes relationships rather than singular entities, process rather than product, and becoming rather than being (Gleick, 1987).

If we accept this metaphor as reflective of developmental education, we must utilize research methodologies that appropriately address questions of process, relationship, and becoming. We must realize that reductionist methodologies might be helpful at times, but will never tell the whole story. Both quantitative and qualitative research methodologies have their place, yet it is only through recognition of the greater system and recognition of our own position in that system that we can make honest and trustworthy contributions to our field.

> When we choose to experiment for one aspect, we lose our ability to see any others. Every act of measurement loses more information than it obtains, closing the box irretrievably and forever on other possibilities....It is difficult to develop a new sensitivity to the fact that no form of measurement is neutral (Wheatley, 1992, p. 63).

We are a society that has historically attached great significance to principles of the physical sciences and has attempted to adapt these principles to other fields such as the social sciences. Objectivity, value neutrality, and the separation of the researcher from the researched have been held up as the ideals of the dominant paradigm, but many researchers utilizing qualitative methods have called such assumptions into question. Feminist theorists also reject the dichotomous relationship between objectivity and subjectivity and the context stripping that is characteristic of "pure" scientific research (Code, 1991; Hubbard, 1988). Value neutrality, objectivity, and separateness are elusive creatures, and their importance is de-emphasized in the new tradition. While every analogy fails at some level, principles of the new science nicely parallel philosophical shifts in several disciplines and lend credibility to a different way of investigating our experiences.

We live in a rapidly changing world. Businesses, religious organizations, and educational systems remain in a constant state of flux. In developmental education we have recognized the need for innovation, for building communities, for going beyond what we have been able to do in the past. To bring our philosophy into line with programs and research, we must shed the constraining nature of the Newtonian paradigm and be ready to engage in a philosophy reflective of the new science. Ours would be a philosophy that advocates nonlinear thinking, that recognizes the holistic nature of open systems, and that places primary emphasis on relationships and connections. It is fascinating to realize how the direction developmental education is taking parallels

the principles of the new science. We seem to be a part of a larger movement in the coevolution of our society.

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Issues Affecting the Definition of Developmental Education

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An uninitiated observer of the field could with justification conclude that developmental education suffers from an ongoing identity crisis. Evidence fueling this belief comes from the seeming inability of the field to settle on a name for itself. The term developmental education has attained some longevity. Since its editors renamed the Journal of Remedial and Developmental Education the Journal of Developmental Education in 1976, the field has accepted the latter designation. However, developmental education has been known by many other names during its considerable history prior to 1976. In addition, signs point to a current inchoate dissatisfaction with developmental education as a label. There is a need to look behind the labels to contemporary definitions, extensive history, emerging trends, and persistent issues that have implications not only for what the field calls itself, but also for how the field conceptualizes its efforts.

This discussion will (a) examine recent definitions of developmental education as a starting point, (b) briefly review the field's history to illustrate and examine conditions that gave rise to a multiplicity of appellations, (c) look at arguments for renaming the field and factors implicated in calls to do so, and (d) examine in some depth trends and issues with which the discipline will continue to grapple.

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Contemporary Definitions

Developmental education typically refers to programs and services designed to meet the needs of underprepared college students. The National Center for Education Statistics (1991) illustrated such a definition when it directed respondents to its survey on developmental education to consider under this term any "program, course, or activity (in the areas of reading, writing, or math) for students lacking those skills necessary to perform college level work at the level required by your institution" (p. 46).

The National Center for Developmental Education (Boylan, Bonham, & Bliss, 1992) used a similar working definition in the Exxon Study, excluding from developmental education the teaching of English as a Second Language (ESL) when taught to foreign students.

These definitions echo similar ones by Cross (1976) and Maxwell (1979), both of whom called attention to distinctions between remedial and developmental education. Remedial education, Cross and Maxwell agreed, involved bringing underprepared students, especially those with the weakest preparation, up to the levels of skills required for success at their institutions. However, Cross believed that developmental education was a broader term signifying the goal of talent development for typical students at any given institution. Maxwell maintains, in contrast, that the term developmental education came into use to avoid the stigma of remedial education. Indeed, many states would not fund remedial programs while they would subsidize developmental education (Maxwell, 1979). However, Maxwell pointed out that when waves of underprepared students entered higher education in the 1960s and 1970s, they became the more typical students. The phenomenon of this new majority (Boylan, 1990) blurred the distinction between remedial and developmental education programs; the typical student was often underprepared.

Although remedial and developmental education are sometimes used synonymously, with developmental education preferred as an ameliorative designation, there are many other terms that have been associated with developmental education throughout its history.

The History of Developmental Education

American higher education is characterized by cycles of influx by non traditional students considered underprepared when they first enter until they become a new majority (Boylan, 1990). Within the earliest American colleges, students who did not want to study for the ministry and were not proficient in the Greek and Latin needed as background for such study were the first set of underprepared students (Boylan, 1990).

Following the establishment of land grant colleges just after mid-century in the 1800s to teach agricultural and mechanical courses, the disciplines demanded by the sons of the prospering middle class, colleges established preparatory programs or departments for students weak in reading, writing, and arithmetic (Boylan, 1990; Maxwell, 1979; Tomlinson, 1989; Wyatt, 1992). In 1889, at the height of the preparatory department movement, only 65 of the 400 colleges did not have such programs (Wyatt, 1992). Thus, college preparatory programs and preparatory studies

were the earliest labels for developmental education as these types of programs proliferated in the latter half of the 1800s (Tomlinson, 1989; Wyatt, 1992).

Underprepared students continued to be accepted into institutions of higher education as colleges competed for students (Maxwell, 1979). To illustrate, in 1907 at Harvard, Princeton, Yale, and Columbia over half the students enrolled did not meet entrance requirements, and these schools established developmental courses (Wyatt, 1992). The situation was not dissimilar at institutions of higher learning around the country, so that by 1941 a survey indicated that college reading courses along with how-to-study courses were widely offered (Wyatt, 1992).

Later two groups exploded into higher education in large numbers, creating surges in the demand for developmental programs and services. The first group was World War II veterans, who entered by the millions to take advantage of the generous provisions of the G.I. Bill (Boylan, 1990; Maxwell, 1979; Tomlinson, 1989; Wyatt, 1992). The second group was comprised of underprepared students who entered colleges and universities from the 1960s to the 1980s in response to open admissions policies and readily available government funding, particularly for low income students, following the passage of the Civil Rights Act of 1964 and the Higher Education Act of 1965 (Boylan, 1990; Maxwell, 1979; Tomlinson, 1989; Wyatt, 1992).

The incursions of these new majorities into higher education (Boylan, 1990) led to a proliferation of developmental programs and services. Labels for these programs and services multiplied as well. Chief among them were such terms as preparatory studies, academic support programs, compensatory education, learning assistance, and basic skills. Tomlinson (1989) suggests that it is the controversy associated with remediation at the college level that has in large part led to a multiplicity of labels for the field. The controversy stems from two major beliefs. One is that developmental education has contributed to a lowering of academic standards (Tomlinson, 1989). The other increasingly held belief is that college developmental education programs are too costly to provide when compared to the cost of providing remediation at earlier levels of schooling (Ross & Roe, 1986). The latter view led to the proposal that the 20 campus California State University system abolish remediation (Chandler & Colvin, 1995).

The history of our field provides insights into how, despite a significant role in American education, it has not operated under a single banner. This has no doubt diminished the visibility of the profession. The series of names associated with developmental education, such as preparatory studies, learning assistance, compensatory education, remedial education, and basic skills (Tomlinson, 1989), suggests an identity problem, if not an identity crisis.

Maxwell (1992) argued that developmental educators should consider renaming themselves. Clearer communication to those outside the field was one rationale for the suggested change. Developmental education, perhaps more than most disciplines, has been influenced by trends and issues outside the field.

Defining Developmental Education: An Issues Approach

Developmental education, like any other component of the education field, is not a discrete entity; it does not exist in isolation, and its existence is relative rather than absolute. In many

ways, developmental education has been defined by practitioners and administrators from outside those programs designated for the at-risk or underprepared student. English faculty in particular, and generally all writing intensive content areas, in addition to math and science programs, have participated in determining the parameters of developmental course content and the categories of students who would be recommended or mandated into developmental courses. Legislators, taxpayers, and employers have, by their demands for accountability in education and their increased need for a competent work force, influenced the focus and scope of developmental programs. Indeed, most of the academic, economic, and social issues that have helped define developmental education have evolved, not from within developmental education programs, but from society's expectations of education.

Academic Issues: Access versus Excellence

Americans have historically had high expectations of education, expectations that have frequently been idealistic, at best, and dangerously unrealistic, at worst. Popular schooling has been held accountable, often simultaneously, for saving and destroying America. Cremin (1989) describes the culture of education worship and education's inability to live up to society's expectations "...I would trace the most fundamental and abiding discontent with popular education in the United States to the sense that it is not only an impossible ideal but in the end a hopeless contraction" (p.35). In theory, education as the great equalizer is how society views the democratic ideal of giving a child from the lowest of socioeconomic circumstances access to an education equal to that afforded a child from great wealth; in its romantic ideal, education embodies all that is best in American democracy because it holds the promise of equal opportunity for all who choose to participate. Developmental education is then both the promise that it is never too late to engage in this opportunity for equality and the reminder that all things are not equal in education, just as they are not in society.

The 1990s have found education in the middle of the excellence segment of the access versus excellence cycle. In the access phase of the late 1960s through the 1980s, postsecondary education subscribed to the goal of allowing all students the opportunity to come to college, either through open admissions policies or special admissions categories for underprepared students. At least in part, the rationale for such policies came from developmental psychologists' assertions that individuals learn at different rates and in different ways. If students were academically less successful in kindergarten through high school (K-12) programs than their college bound counterparts, the reason may have been a poor match between developmental readiness or learning style and the language and teaching style in the classroom. Gardner (1983, 1993), Lazear (1993, 1994), and Armstrong (1994) make a strong case for looking beyond the traditional and narrow way in which we define intelligence. For decades, developmental educators have argued informally that many of their students bring to the classroom a certain, often indefinable, savvy about the world and how it works that escapes detection on standard diagnostic and placement tests. In addition, differences in maturity and motivation to learn make some eighteen year olds ready for the independence and pace of learning in college while others, whose academic performance was slowed by immaturity and low motivation, may not be prepared for college courses immediately after high school.

Not to be ignored, but too cumbersome to discuss at length here, are the more global issues that influence our view of developmental education. Some of the rationales for extending access are tied to external factors such as unequal academic opportunity across socioeconomic levels, unequal funding of K-12 programs, unequal and unfounded academic expectations of students from different racial, linguistic, and ethnic backgrounds, and erroneous and inappropriate student placement and tracking based on flawed assessment or other data. If an inaccurate diagnosis and placement occurred early in the educational process, the student may have been advised away from core college preparatory courses and programs that would hone college level reading, writing and mathematics skills. For exploration of those external factors, the following authors provide a starting point: Allington and Walmsley (1995), Bowles and Gintis (1976), Edelsky (1991), Keller, Deneen, and Magallan (1991), Kozol (1991). In spite of the compelling egalitarian, access oriented rationales for open admissions, academic issues, coupled with economic realities and political arguments, forced the cycle from full access to more limited access and reemphasized higher education's commitment to high standards and program excellence.

The Issue of Accountability: Evaluating Program Effectiveness

Research into the effectiveness of developmental programs for college students has been sporadic, typically underfunded, and often inconclusive: Many factors have hindered research into the effects of developmental classes, study skills courses, tutorials, and counseling programs on the performance of underprepared college students. Most of these problems stem from scarce research funding and from the diversity in the programs themselves. Significant research efforts that came from credible entities such as the National Association for Remedial /Developmental Studies in Post-Secondary Education (Boylan, 1983) and The National Center for Developmental Education in conjunction with the Exxon Education Foundation (Boylan, Bonham, & Bliss 1992) are evidence of the interest and value that developmental education has assigned the role of research.

In the late 1960s and early 1970s, when the baby boom wave of underprepared students came to college, significant amounts of money were allocated for delivery of basic skills programs. However, in the rush to take services to the most needy students, research and program evaluation were assigned a low priority. As services expanded and programs developed, meager funds were allocated to research and evaluate developmental education programs. Early studies (Astin, 1975, 1977; Boylan, 1978; Cross, 1976; Maxwell, 1979; Roueche, 1968; Roueche & Kirk, 1974) contributed much needed feedback to program administrators, but developmental programs tend to be as diverse and heterogeneous in nature and scope as the student population that they serve, making them difficult subjects for standard research methodology.

Traditional research in K-12 education has enjoyed the benefit of distinct content disciplines with well funded and professionally developed assessment and clear curricular goals. Developmental programs have no uniform residence. For example, basic writing may be housed with the English Department or in a separate developmental division or in tutorial or computer assisted laboratories, making the tasks of comparison and replication more complicated for researchers intending to conduct large scale studies. The lack of program mandated standardization, perpetuated by a general hands-off policy on the part of state higher education accredita-

tion entities, may have allowed developmental education programs to be attentive to the needs of the student population they serve but extremely difficult as the subject of research efforts. Contrast the evaluation of the eclectic range of developmental programs to the much simpler task of evaluating the effectiveness of a standard third grade language arts curriculum for a relatively homogeneous population of nine year olds who have previously completed similarly standardized first and second grade language arts curricula.

Early research efforts in developmental education met resistance from colleagues in science and social science research because much of the research was descriptive and qualitative in nature. It lacked rigor. It was often action research carried out in teachers' own classrooms, and it lacked the objectivity and control that had become standard in behavioral research projects. Furthermore, it was often unfunded and undocumented, but it was a beginning.

Researchers in the current excellence phase of the access-excellence cycle, when education dollars are scant and legislators and taxpayers want evidence that expensive programs work, must learn to evaluate student outcomes in ways that make sense to voters but also give a clearer view to educators. Research can answer questions, at least in a formative sense, about the effectiveness of open admission policies, conditional or probationary admission policies, mandated basic skills assessment and subsequent remediation, transferability of study skills from generic to content-specific application, and counseling for personal organization or motivation or stress relief or dozens of other topics. In addition to student-centered and curricular studies, researchers need to explore optimal ways to train professionals to teach and administer programs for at-risk students.

Economic Issues: How Much Will It Cost?

Ask state legislators and college administrators. Ask the parents of college students. Ask college students themselves. A college degree is an expensive commodity. Kroe (1992), in a National Center for Education study, estimated the typical tuition, fees, room and board charges for the 1991-92 academic year at $4900 for four-year and two-year institutions. When students face mandatory basic skills assessment and subsequent developmental requirements, the time and financial resources allocated for a degree increases. For states like Arkansas, Georgia, Texas, Florida, and New Jersey, that require assessment and placement in whatever subject or skill the assessment indicates, students must postpone core curriculum courses such as English composition and required mathematics courses until they can successfully complete required developmental prerequisites and retest. Generally, developmental courses count for institutional credit in the freshman year toward residency, for enrolled hours for financial aid and extracurricular requirements, and for sports eligibility, but they typically do not count toward graduation. Usually students must pay regular tuition rates for these developmental, non-graduation credit courses, which adds to the total price of a degree.

No firm estimate of the cost of developmental education to state and local budgets seems to exist; Abraham (1992) cites a state cost range from $2 or $3 million up to $10 million. Taxpayers and their elected representatives may or may not be aware of the cost of developmental educa-

tion courses to the state, but informed voices from the policy sector, such as Tucker (1991), president of the National Center on Education and the Economy, have begun to call for taking

> ...the money we now spend on the high-cost, low-efficiency segment of our "postsecondary high-school" system and use it in the schools to do the job right the first time. Why not ask colleges to join in helping the schools to educate everyone —especially our poor and minority students— to a real college-entrance standard? (p. A36)

The more academically diverse the student population, the greater the cost of meeting the needs of all students. For colleges, the bottom line is that by admitting students who do not meet college level academic standards and charging them full tuition and fees, the only ethical solution is to offer assistance commensurate with student need. Clearly this need will vary by institution; the community college with an open admission policy must address a greater need than the four year college with selective admission requirements. The greater the student or institutional need, the greater the proportional expense for developmental programs.

Education as the Cure for Society's Ills

If postsecondary education offers students the most certain route to secure careers and lucrative salaries for individuals and economic prosperity for our national economy, a proposition voiced at various times by educators as well as the public and private sector employers and government officials, education would be expected to take on the role of solving all problems. Cremin (1989) argues that attempting to solve all of America's ills, especially economic competitiveness, is a dangerous plan. After the 1957 education frenzy over the former Soviet Union's launch of Sputnik, Americans looked to education as the quick fix solution to our relatively slow start in space exploration. For the economic woes of the 1990s, education is again being tapped as the proper weapon to bring the economy back to competitive standing. If there is a link between level of literacy, education, and training and a nation's economic well being, and if the nation expects education to provide this competitive edge, higher education will need to continue to lure the current 50% plus of our population into postsecondary programs, and it will need to find a way to keep them in those programs through graduation. That is a daunting prospect for developmental educators if the retention and graduation rates of at-risk students fall well below the national average. If the mean college dropout rate is in the 66% to 75% range (Tucker, 1991), higher drop out rates for developmental students will be significant cause for even the strongest proponents of education to question the economic value of open admissions policies and the developmental programs that accommodate at-risk students.

Shor (1992), in exploring the rationale for promoting education as the path to economic prosperity, argues that educators must guard against the negative side of viewing education as the answer to America's economic woes. In response to America 2000, Shor quotes the Department of Education publication:

> eight years after the National Commission on Excellence in Education declared us a "Nation at Risk," we haven't turned things around in education. Almost all our education trend lines are flat. Our country is idling its engines, not knowing enough or being able to do enough to make America all that it should be (p. 9).

Shor (1992) warns that education will continue to be blamed for low-literacy, low-skilled workers, and ultimately for America's economic decline, when in fact "blaming poor education and allegedly undereducated workers for unemployment and the economic crisis are old themes of the restoration period, which serve to distract attention from the ruinous economic policies pursued by business and government..." (p. 233). Educators who work with at-risk students must shudder when they reread some of the America 2000 goals: a 90% high school graduation rate, competency in five core subjects (as measured by whom, we ask?), and first in the world in science and mathematics. Unfortunately, all of this is to be accomplished after significant budget cuts at the national level for programs aimed at equalizing the unequal funding of public K-12 education. When education fails to deliver the 90% graduation rate, and the first prize in science and math, and the core subjects competency, because those hard to reach students drag down the national average, educators —especially those who work with academically disadvantaged students— will be a handy scapegoat for the economic woes of the year 2000.

Social Issues: Education Stretched Too Thin

American education, especially K-12, has nominally borne the responsibility for transforming students from tremendously diverse backgrounds and cultures into patriotic, law-abiding citizens. Horace Mann (1845) and John Dewey (1916) viewed education as the place to address social differences among a heterogeneous student population. In the postsecondary institutions of the 1940s and 1950s, Conant (1953) saw the perfect setting for training the nation's leaders, as well as protecting academe from dilution. The 1960s and 1970s brought postsecondary access to levels never before experienced in this country, and the goal of the most vocal of those students was reform. Education became the empowerer of the oppressed and the vehicle to correct social ills; segregation, discrimination, poverty, and illiteracy stood no chance in the face of an educated nation.

But, in the beginning of the access phase and before the Great Society programs aimed at eliminating poverty and illiteracy, experienced educators saw flaws in the plan; education was to be stretched to meet new demands from government and taxpayers. Jencks (1964) was skeptical of burdening education with affecting social reform (and economic reform) without initiating significant redistribution of income; his recommendation was to use social programs rather than education to enact social change. Jencks (1972) saw flaws in expecting education to equalize opportunity for students whose lives outside of school reflected anything but equal opportunity because school could offer too little contact and it would come too late to equalize participation in economic and social stability.

More recent voices have called for systemic changes that may, over time, have an impact on what education can contribute to social reform. Shor (1992) calls for what he terms an "opposition agenda" to address social issues. Generally this involves teaching students to question authority, to have high expectations, to expose and oppose inequalities, and to spend the money on social programs and education that is currently being spent on the military. A sample of his reform plans for postsecondary education includes unrestricted open admission, free tuition, affirmative action in admission and hiring, increases in teacher pay, and free access to all books, materials and ideas. The 1994 elections and the conservative reform document that is sweeping

the Republican-dominated House of Representatives make these proposals, or any proposals friendly to programs for at-risk students, less likely to be realized in the near future.

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Enhancing Education through Cooperative Learning

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"What the child can do in co-operation today he can do alone tomorrow." (Vygotsky, 1986, p. 188)

The words cooperative and collaborative, meaning working together for a common cause, are alien to a country whose ideals are based upon the concepts of rugged individualism and competition. Images of classrooms filled with wooden desks, which are perfectly aligned in permanent rows, reflect this individualistic history that discouraged peer interaction. A historical approach to cooperative learning affords the opportunity to view the concept as a whole and to determine the best methods for use in the developmental classroom.

Early Findings

Although the idea of cooperation blossomed in the twentieth century, records dating back to 1875 through 1880 reveal that Colonel Francis Parker, a school superintendent, introduced the idea of cooperative learning in Quincy, Massachusetts. (Nielsen, 1994). Even though the concept attracted thousands of visitors, cooperative learning was not formally studied for many years. The pioneers in this field first explored the social nature of learning. In 1929 Maller investigated cooperation versus competition and determined that cooperation was more efficient among group members who were similar in age, intelligence, and social factors. He also noticed that

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"only" children (i.e., those without siblings), and those having more than four siblings were less cooperative than average (Maller, 1929). During this time period, Vygotsky's (1978) work in psychology led him to consider the social nature of language and its influence upon student learning. He explained the potential for growth with others through the "zone of proximal development", concluding that "what children can do with the assistance of others might be in some sense even more indicative of their mental development than what they can do alone" (p. 85). He added, "human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them" (p. 88). Dewey (1936) also focused upon the social aspect of learning when he said, "isolation of subject matter from a social context is the chief obstruction in current practice to securing a general training of mind" (p.79). In addition, Rosenblatt (1938) reflected upon the influence of society on education and its limiting effect on teaching by saying:

> The individualistic emphasis of our society builds up a frequent reluctance to see the implication for others of our own actions, or to understand the validity of the needs and drives that motivate other people's actions....We teachers of literature must take this cultural pressure into account, since it is so directly opposed to the attitude of mind we are attempting to foster. For the very nature of literary experience is a living into the experiences of others and a comprehension of the goals and aspirations of personalities different from our own (p. 108).

In the following decades questions concerning how students work together were examined. In the 1940s Morton Deutsch, a social scientist, categorized learning according to three types of structures: cooperative, competitive, and individualistic (Nielsen, 1994). His findings led him to believe that the cooperative method was very effective when used with college students (Deutsch, 1949). Grossack (1954) also discovered that college students who studied in groups had more cohesiveness, more agreement among group members, and communicated more appropriate information than those working competitively. Furthermore, he considered the importance of frames of reference, noting that students who viewed themselves as cooperative expected others to be cooperative as well. While comparing college students who worked cooperatively and competitively, Haines and McKeachie (1967) concluded that students working cooperatively felt reduced tension, exhibited more task-oriented behavior, and operated more effectively together than competitive students.

Research of the 1970s

Focus shifted to the teacher's role in cooperative learning when Abercrombie (1974) concentrated on the role of the college professor, recognizing that the instructors' part in cooperative learning means rethinking the idea of being dispensers of knowledge. He challenged teachers to develop self-discipline by listening more, talking less, and directing energies to interactions among students through group work.

During the 1970s investigators looked more deeply into cooperative learning to examine what happens within groups. Researchers analyzed the effects of cooperation in the college envi-

ronment by watching for patterns or trends emerging from cooperative group work outside the large college lecture classroom. The findings indicated that team work resulted in better performance and grades on a joint paper; groups functioned well outside the classroom when a shared reward was involved; group solutions were effective when tasks were divided into parts; and individuals who initially performed poorly on a test achieved better test results after working in groups. An added observation was that the more able students assumed the role of the tutor in the group but did not gain in performance (McClintock & Sonquist, 1976). However, when students were designated as teachers within their groups, and when teachers were trained to become facilitators, rather than transmitters of knowledge, students reported a higher level of self-esteem, the ability to bond with groupmates, and positive reactions toward school, (Blaney, Rosenfield, Aronson, & Sikes, 1977).

Piaget (1950) hypothesized that cooperation might reduce egocentrism. To test this hypothesis researchers studied students who worked individually as well as those who were assigned group tasks. The findings demonstrated that students in the cooperative groups were more altruistic, more intrinsically motivated, and had higher achievement levels than those working individually. Teachers observed that students working in groups had fewer problems following directions and spent less time waiting for the teacher. They also reported, however, that students initially lacked cooperative learning skills (Johnson, Johnson, Johnson, & Anderson, 1976).

Barnes and Todd (1977) considered dialogue and its impact on the construction of meaning when they analyzed speech during group interactions. Believing that the teacher does not have to be present for learning to take place, they showed trust in the learners by saying, "that children are underestimated, and that they possess skills and competencies which are rarely called upon in a conventional classroom" (p.ix). The researchers believed that teachers, rather than learners, traditionally do most of the talking, taking "responsibility for the content, pacing, and style of pupil contributions" (p.ix), and hoped to prove that when students work in small groups, without the aid of adults, they take responsibility for knowledge gained and management of the group, for they must judge, monitor, resolve conflicts, and cope with other opinions. In analyzing the types of speech within these groups Barnes and Todd observed the following interactive responses: students initiated issues, qualified contributions, requested illustrations, provided examples, supported statements, reformulated ideas, evoked additional information, and completed unfinished statements. They concluded that working together enables students to clarify understanding of topics, while developing social and cognitive skills.

Studies linking cooperative learning, critical thinking, and teaching methods were conducted by Smith (1977), who focused on four levels of activity within the college classroom: encouragement by the instructor, questioning procedures, cognitive level of participation, and peer interaction. Employing of these factors resulted in positive changes in critical thinking; students who were active participants exhibited even higher critical thinking scores than students with minimal participation.

Johnson and Johnson (1979) connected the idea of conflict with critical thinking. They viewed conflict, i.e., the occurrence of incompatible activities, as either positive or negative,

depending upon its management, and agreed that teachers often suppress the very conflicts that can lead to "valuable opportunities to increase student motivation, creative insight, cognitive development, and learning" (p. 51). A type of conflict studied was controversy, which "exists when one person's ideas, information, conclusions, theories, or opinions are incompatible with those of another person, and the two seek to reach an agreement" (p. 53). Conceptual conflict, on the other hand, "exists when two incompatible ideas exist simultaneously within a student's mind and must be reconciled" (p. 53). The studies indicated that disagreements occurring during a group task resulted in conceptual conflict, uncertainty, curiosity, encouragement to move to higher levels of reasoning, and increase in creativity and the quality of problem solving. Therefore, the researchers inferred that creating controversy is a good teaching strategy for learning and intellectual development, for the purpose of controversy "within a cooperative group is to arrive at the highest quality solution or decision that is possible" (p. 56). Constructive controversy should center around accurate communication, a supportive atmosphere, and the ability to deal with feelings and recognize similarities and differences. However, conflict will not necessarily result unless the concept is related to the students' cognitive and moral reasoning ability.

Investigations in the 1980s

By the end of the 1970s, attention was placed upon specific learning strategies and the mechanics of group work. Sharan (1980) investigated these approaches and concluded that team learning methods encourage students to become involved without direct intervention by the instructor. In addition, group involvement influences cognitive learning, attitudes toward learning, relationships with group members, and construction of meaning. Sharan concluded that all of the methods reviewed resulted in superior performance in small groups as opposed to large class situations. When Slavin (1983) examined the benefits of cooperative learning, he found positive advantages in academic achievement, locus of control, self-esteem, feelings about classmates, altruism, and new perspective-taking.

Research in the late 1980s reflected the social nature of reading, the construction of knowledge, and the interaction between students and teachers. Concerned with the way students learn, Wells (1986) endorsed the construction of meaning through collaboration and promoted the active involvement of students in creating lessons. He believed that class negotiations with the teacher would promote ownership and responsibility for students. Bloome (1987) reiterated the idea that reading is a social process, "a means to participate in and establish a community or social group" (p. 123), when he summarized the following constructs concerned with building a theory of reading: interpretation of reading mirrors the culture; social meaning is influenced by interpersonal relationships; literacy is defined in a variety of ways; social status is given to reading ability; and literacy learning in school does not necessarily reflect literacy activities outside of school. All of these factors support the idea that reading is sociocognitive in nature, involving "a process of socialization, enculturation, and cognition" (p. 126). Green and Weade (1987) defined reading as "a product of the interactions among teacher, students, and material and thus is the result of interpersonal processes as well as interpersonal ones" (p. 3). They believed that the

classroom provides a communicative environment in which teachers and students construct and negotiate lessons, and learn with and from each other in a setting bounded by physical space, roles, and rights.

Current Thoughts

Within the last decade the simple act of communication within small groups has been structuralized by "how-to" handbooks. For example, specific, organized, and exact planning activities are reflected in Spencer Kagan's (1992) six key concepts: teams; will to cooperate; management; skill to cooperate; basic principles of simultaneous interaction, i.e., positive interdependence and individual accountability; and structures. Filled with numerous activities, the book precisely outlines teaching methods designed to establish cooperative activities within the classroom. Groups are not only designated as formal cooperative, informal cooperative, and cooperative base groups, but participants are also assigned the specific tasks of reader, recorder, calculator, checker, reporter, materials handler, encourager of participation, praiser, and checker for understanding. In addition, five basic elements of cooperative learning experiences are noted: positive interdependence (achieved through the common goals), individual accountability (students assuming personal responsibility for actions), face-to-face interaction (the ability to easily view other group members), interpersonal skills (listening, support, and communication), and group processing (group analysis of interactions) (Johnson, Johnson, & Smith, 1991).

Most recently, the commercialization of collaborative learning products has come under fire. Moffett (1994), a long time supporter of collaborative learning, states that over time "a perfectly natural human process requiring no commercial materials was proceduralized beyond recognition. Small-group interaction was ritualized fore and aft by so much goal setting and assessment, briefing and debriefing, that little time remained for the substantive collaboration itself, which was so formalized, moreover, that little choice or spontaneity remained" (p. 85).

Looking at the chronological events dealing with cooperative learning not only provides an opportunity to examine its value and merits but also affords the chance to eclectically choose the most beneficial research for incorporation within the developmental classroom.

Implications for Developmental Education

Research findings indicate positive outcomes associated with cooperative learning; although past history emphasized individualism, the future will be marked by more cooperative efforts. The goals of the college developmental education instructor are interconnected with the benefits of cooperative learning as cited. These goals involve creating classroom conditions in which students are given the freedom to become active students, construct meaning, think critically, find relationships, clarify thinking, and respond to challenges. Cooperative learning, by its very nature, invites students to become active learners. New perspectives are shared within groups as a result of the existing variety of background knowledge. Listening skills are honed as students read, report, and communicate ideas to each other and engage in problem solving as a group.

Generalizations are supported by facts that students obtain by returning to the text for verification, thus clarifying ideas. Students not only learn by teaching, analyzing and synthesizing information, but also develop social skills in a less threatening atmosphere. Small groups demand a degree of metacognitive awareness by which students constantly monitor their statements and progress toward a goal. Collaboration between the teacher and students also develops an atmosphere that builds a community of learners.

In order to cope with the demands of an ever-changing society, students will have to develop the skills that employers seek. John Gardner (1994), advocate of "The Freshmen Year Experience" has developed a list of critical skills sought by employers. The components are intertwined with the goals of developmental instruction. This link is evident in the following list: interpersonal communication, listening skills, critical thinking, problem solving, time management, goal setting, ability to work with others as part of a team, and collaboration and negotiation skills. Incorporating cooperative learning experiences into the college classroom will both reinforce the skills necessary to cope with future courses in college and provide students with the qualifications that will make them employable. Supporting the development of these skills is the teacher, who is no longer the dispenser of knowledge, but the guide, the challenger, the listener, the encourager, the learner. For, according to Moffett (1983), "The role of the teacher is to teach students to teach each other" (p.196).

Questions for Further Consideration

Even though there is a large body of knowledge assembled concerning cooperative learning, additional questions need to be explored. What are the effects of cooperative learning on nontraditional students when working in groups with traditional students (and vice versa)? How will attendance be influenced with the introduction of cooperative learning groups? What impact will collaborative work have on acquisition of skills such as comprehension, vocabulary, and critical thinking and problem solving? How will this be determined? How will instructors respond to using cooperative learning? How will class participation be influenced by the incorporation of cooperative learning methods? How will students react to working with others after being "groomed" to work individually? How will students subsequently react in classes that do not employ cooperative learning? How will interpersonal skills learned through cooperation transfer to the workplace?

The benefits of cooperative learning are far reaching. If used under the guidance of a knowledgeable instructor, students can learn the skills that will help them survive in college as well as in the work place. With a focus on the future, the opening words by Vygotsky can be rephrased: What students can learn with others will lead them to become the critical thinkers and problem solvers of the future.

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Effects of Learning Support on College Algebra

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As with many first year university courses, college algebra has a very high withdrawal and failure rate. It has been reported (Stone, 1995) that failure and withdrawal rates sometimes reach as high as 50%. The retention rate of an institution can be seriously affected when students who meet these freshman level courses head-on fail or withdraw. Traditionally, academicians thought of these first year courses as weeding-out courses, but with reemphasis on retention and equal access to education, postsecondary institutions are rethinking this attitude. In the 1970s, many colleges and universities established developmental education departments to enable students to gain entry and succeed in the postsecondary environment (Stone, 1995). Today, many states (D. D. Chase, personal communication, July 25, 1995) are considering discontinuing postsecondary developmental studies programs for various reasons: some economic, some philosophical.

The Mathematics Unit of our university's Learning Support (LS) Program, formerly the Division of Developmental Studies, is composed of professors who agree with Robert White (1987), President of the National Academy of Engineering when he suggests that calculus should function as a pump not a filter. Our unit further expands that philosophy to include all mathematics. Because algebra is the basis of all higher level mathematics, students must walk through

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the door of algebra well prepared and motivated to continue in their mathematics education. The Board of Regents of Georgia's University System has recently given the Division of Learning Support Programs more latitude in designing courses for students who need academic assistance in high risk core courses. The Academic Affairs Handbook (1994) states: "They may establish developmental studies or other academic assistance requirements as co-requisites with core curriculum courses" (p. 3). This latitude brought more responsibility for the Division of Learning Support Programs to address retention efforts not only in core courses but also in all courses throughout the university. With this faculty dedication and administrative support, the professors in this unit began to develop a new Learning Support co-requisite course to give academic assistance to students who need help with college algebra.

Who are these students in need of academic assistance? These students have been described and classified by numerous researchers (Christoffel, 1986; Clewell, Anderson, and Thorpe, 1992; Noel, Levitz, and Saluri, 1985; Tinto, 1987) who have written about the failure of students and the failure of secondary schools to prepare them. Some students are indeed ill prepared by an inadequate or incorrect high school curriculum, others are nontraditional students who have forgotten mathematical content and techniques, and even more lack enthusiasm for and interest in mathematics. These students cross all economic and ethnic boundaries. However, instead of blaming students for their lack of background and labeling them high risk, our unit chose to take the perspective of the University of Missouri-Kansas City, advocates of Supplemental Instruction, and identify some core courses as high risk because of their high failure and withdrawal rates.

As Levine (1994) reports, scores of ideas "demonstrate some successes or appear to have significant promise for improving academic performance" of African American and low income students (p. 46). Many of these models aid in assisting the full range of underprepared college students. Our college algebra co-course was the third of such courses at our university designed to give support to more first year students in high risk courses. Previously, we had paired co-courses with History 113, Survey of American History, and English 111, Composition I. We had also established Supplemental Instruction courses for Accounting 201, Biology 141 and 142, and Political Science 101. Dimon (1988), when reporting on adjunct courses at California State University, says "adjunct courses work" (p. 33). Our division wanted to continue that successful trend.

Paired Courses

To initiate our college algebra pilot co-course, our unit sought support from the Mathematics Department and planned to pair our Learning Support co-course (LS094) with a simultaneously running college algebra course (MATH 104). A meeting was held with the Mathematics Department chair and faculty involved in teaching college algebra courses to determine interest. The Mathematics Department, recognizing the difficulties first year students have with mathematics courses, welcomed assistance for these students. The response to our proposal was overwhelmingly positive. Next, we needed to find an appropriate math faculty member to pair with

our co-course instructor. Additionally, we needed a system for manipulating the scheduling requirements.

Because part-time instructors and graduate assistants teach many of the college algebra classes, and because scheduling is implemented quite late in the student registration process, we had a major problem. We wanted to find an instructor who felt a strong connection to the university and its mathematics programs and who felt passionately about helping students. Technology also played a part in our decision. Our Learning Support Division is dedicated to following the directives of the National Council of Teachers of Mathematics (NCTM) Curriculum and Evaluation Standards (1989), which call for the availability of appropriate technology to students at school and at home. Our Learning Support unit has seen the success of students who use graphing calculators both in class and at home. We agree with Cusco, Goldenbert and Mark (1995), who state, "In all situations, technology should be tightly interwoven into the educational experience used both as a tool and as a means for creating new teaching strategies" (p. 236). We wanted a college algebra instructor who encouraged the use of this technology. Luckily, we were able to find such an instructor. She was teaching two college algebra classes, listed in the course schedule as "TI-82 calculator required." Because of this requirement she was most often scheduled for classes early and knew which sections she would teach. After a discussion about the collaboration, she agreed to pair her two college algebra classes with our co-courses. Each of the college algebra classes had room for 40 students. Cooperation with the Mathematics Department Chairperson and the college algebra instructor was absolutely necessary to the success of the co-course.

Preparation of the co-course instructor was also important. As the first to teach the pilot co-course, I found my experience teaching college algebra very valuable. As a professor in Learning Support Programs, I had taught it twice in previous quarters and had a pass rate of 88% in the two courses. Familiarity with the text, the required curriculum, students' attitudes, and varying skill levels were all necessities. The next obstacle came with scheduling students into both classes and getting an appropriate population of students.

Population

During the two quarters of planning, our professors discussed the LS co-course with developmental students in the exit level mathematics course. One student explained that she had taken the developmental courses but remained apprehensive and felt a lack of confidence in her ability to pass college algebra. Because these were the types of students that we wanted to target, we went to their classes and described our pilot. We also sent letters describing our co-course to students who made F or W the previous quarter in college algebra. Finally, we posted notices about our co-course throughout the campus. Therefore, our anticipated volunteer population would consist of (a) former developmental mathematics students who felt the need for further academic support, (b) students who had made F or W previously in college algebra, and (c) other students interested in assistance.

Students had to enroll in one of the two specific sections of college algebra and the co-course, LS094. Scheduling required assistance from guidance counselors in our division to save space for students wanting to register for both classes. Although others (Simpson, Holschuh, Nist, & Hynd, 1994) used non-credit adjunct courses with much success, we decided to structure our co-course as a three hour institutional credit course. By the end of the first phase of registration, one LS094 class was full. At the end of registration period, we opened a second section and more students enrolled. Our first LS094 pilot classes ran during the spring quarter of 1995. Both LS classes met on Monday and Wednesday for one and one-half hours for 10 weeks.

Hypotheses

Students who participated in the LS094 course would (a) show equal or greater mathematics proficiency by satisfactorily completing the college algebra course with equal or higher scores than students who did not take the co-course, (b) show decreases in mathematics anxiety, (c) develop more positive attitudes about their ability to learn mathematics.

Pilot

Many of the students enrolled in LS094 volunteered for the course because they were developmental students still lacking confidence in their ability to pass college algebra or they had previously received a W or F in college algebra. This meant they were definitely not randomly assigned. All the students in this study were enrolled in either of two college algebra classes with the same professor, the same work, the same assignments and the same tests. Therefore, for comparison those students in the LS course and the college algebra class are the experimental class and those who took only the college algebra class are the control group.

Instructional Focus

Based on research showing that computer-assisted instruction, cooperative learning, whole group mastery learning and other instructional approaches achieve success with mathematics students (Levine, 1994), the course emphasized the processes of learning mathematics, study skills specific to mathematics, and instructions on the use of the graphing calculator using the content of college algebra.

As Dimon (1988) found most effective, each day's plan directly related to the content of the college algebra class. The first class session began with a math attitudes survey (Hart & Najee-ullah, 1995) and a group discussion of how to study mathematics. Students openly reflected on their purpose for enrolling in the LS class Then the class began a review of elementary algebra. Throughout the ten weeks, group dynamics and collaboration were discussed and encouraged. Students immediately formed their own groups, exchanged phone numbers and arranged study sessions. They practiced using the graphing calculator every day. Before the college algebra tests the class discussed test taking skills and predicted test questions.

Communication among students and between students and instructors was explored. Students reviewed their own time management using daily and weekly logs with emphasis on their study practices. Each student made entries to a "Muddiest Point" list at the beginning of each class meeting to help fill in the blanks of class notes. The classes did exercises in relaxation and anxiety reduction. Students kept journals in which some of them wrote about problem areas in content, attitudes, and personal matters. The instructor provided suggestions and comments. The students and instructor discussed topics specific to mathematics, such as how to start a problem and how to recognize patterns. All the students worked actively to find their personal learning style.

Following the steps of whole group mastery learning discussed by Benjamin Bloom (1974) for the study of algebra content, the students and instructor decided upon each week's objectives. During the week discussion and teaching about that objective took place. Two class days before the scheduled college algebra test, the students took tests on math content in the LS course. Students received feedback and learned corrective procedures for their errors on their progress before they actually took the college algebra tests.

Results

The first hypothesis of this study was that students who participated in the co-course along with college algebra would show equal or greater mathematics proficiency by satisfactorily completing the college algebra course with equal or higher scores than students who did not take the co-course. This study used final grades in the college algebra classes to compare students taking the LS course along with college algebra to students taking only college algebra, as displayed in Table 1.

Table 1

Success of LS094 and Non-LS094 students in College Algebra

College Algebra Grade	LS094	non-LS094
A	3	3
B	8	10
C	11	13
D	3	6
F	0	8
W	2	7
grade averages	2.25	1.57

All the students who completed the co-course passed college algebra. The LS students' average grade in college algebra was 2.22 (SD = 1.05) on a 4.0 scale, while the average for non-LS students was 1.57 (SD = 1.31). Of LS students who completed the quarter, 100% had a passing grade (A, B, C, D) but only 79% of non-LS students who completed the course had a passing grade. On the average, students who participated in the co-course earned a higher score by seven percentage points and by more than one-half letter grade in college algebra than did the students who did not participate in LS094. An independent t-test indicates that the difference in the means of these two groups is significant at the two-tailed 90% level, $t(72) = .68$, $p < .05$. These grade comparisons show that students taking the LS course fared better on average in college algebra than students not taking LS094 even though all the students in the LS class had either entered the university as underprepared or had failed or withdrawn from college algebra previously. Thus, it appears that the LS course did make a difference in student success.

The second and third hypotheses stated that participation in the LS course would help students decrease their math anxiety and develop positive attitudes about their ability to learn mathematics. The students took pre-instruction and post-instruction math attitudes questionnaires composed of a series of statements designed to reflect students' attitudes toward mathematics and themselves as students of mathematics (Hart & Najee-ullah, 1995). A comparison of answers on these tests proved significant. Although the questions were subjective, students seemed to recognize that change had ken place. Several questions revealed changes from negative to positive attitudes. Although at the beginning of the course, many agreed with the statement: "I will never be good at math no matter how hard I try," by the end of the quarter 92% disagreed. By the end of class, 53% said yes to "I believe I am good at math." The largest change was the response to the statement "People are either good at math or they aren't." At the end of the course, students disagreed, showing that students came to believe that math can be learned. The stereotype of the "born mathematician" had been broken.

Other questions indicated that students accepted and used strategies taught in the co-course. Of those who originally said "I usually do my math work alone," 33% said that after the course they did more group work. Many more now reported they "asked questions of other students, discussed homework and class notes with other students." At the end of the LS course the students unanimously disagreed with the statement: "a good student can solve a problem quickly." One of the misconceptions the instructor discussed in the co-course was that mathematics should and can always be done quickly. Conversely, the course promoted the concept that more time should be taken to analyze, characterize and strategize problems. In short, the students answered many other questions about classroom and study habits much more realistically at the end of the course.

The students' journals, which were a requirement for the LS course, provided another measure of student change. Many students began the quarter with extremely negative comments about mathematics, their own ability and the demands of the college algebra class. Even though the students were unsure of their grade in college algebra, their journals during the last week of class reflected more positive tones. Many doubted that their grades would actually reflect the learning that took place during the quarter, yet they cited several specific changes they had made

in study techniques. Many also remembered some of the LS class topics that reflected on their positive influence. Hopes for future math classes ran high, especially in light of the fact that many students had stated at the beginning of the quarter that this would be their last math class. Students used their time logs to reflect and correct some of their time management mistakes. Others said that they had used the relaxation techniques practiced in class during other parts of their life.

The following is a quote from one student's journal:

The Poetry of Algebra

Once upon a time, a boy tried to pass a math class, however, it was to no avail.
Now that the boy has done his homework and enlisted in LS, he has done very well.

Two anecdotal reports seem important. One of the students in the LS and the college algebra class is legally blind. She had dropped college algebra twice previously mainly because of, in her own words, "the highly graphical nature of algebra." However, in the LS class she learned to use the graphing calculator on a magnifying projection screen and actually saw the graphs for the first time. She passed college algebra with a C. A second student dropped the LS course saying "I feel it is spreading me too thin." Without the assistance of the co-course, this student failed the college algebra course.

Pitfalls

After developing adjunct courses for American history at our university, Commander and Smith (1995) addressed six questions to consider during the planning of adjunct courses. These questions underscore the importance of planning, especially for the pairing, the population, instructional focus and grading. Having reviewed the results of this first learning support course for college algebra, our Learning Support Division found some of the same areas of concern in our recommendations for the continuation of the program. Most importantly, the success of the students who took the LS course indicates the importance of continuing to offer the support courses.

Pairing

We took a suggestion from Commander and Smith and paired our math co-course with only one professor. This seems the most workable solution. However, this does pose a difficult scheduling problem. Organizers of such a co-course must engage in appropriate planning, possibly quarters in advance, to work with interested professors of college algebra to set up this pairing. The professors must set objectives, teaching strategies and goals before class begins.

Population

Identifying the population prior to offering the co-course offered an advantage. However, it remains important to expand the advertising of the course. Dimon (1988) suggests in addition to informing students about the co-course, information about the success of past courses should be

made available to students, instructors of college algebra, advisors and counselors responsible for placement and guidance, and administrators. Especially important to continued support and financial backing is getting the data about the success of the courses to administrators . We also suggest that faculty personally go into mathematics classes to encourage students to take the co-course.

Future instructors might need to reevaluate class size. It was a determining factor in several successful class projects. In the smaller class of ten students, the students seemed more comfortable and less stressed. They found it easier to set up study groups with mutually convenient meeting times. Obviously, in a smaller class it was easier to get individual questions answered. Students in the smaller class found the personal attention much to their liking.

Instructional Focus

The dilemma comes when determining how much time to devote to algebra content and how much time to devote to other topics that would help students become generally more successful mathematics students. Although some students will not see that topics such as specific study skills for mathematics and exercises to reduce math anxiety have immediate benefits, it is important to include these topics. Using the formerly described Mastery Learning Techniques, our pilot based co-course grades on algebra content tests and assessment of other requirements such as journals, class discussion and participation. Thus, both content and affective changes were the bases for grades. Grading in the co-course was not difficult, especially because the students got only institutional credit for the co-course and their main objective was to affect their grade in college algebra.

Another recommendation concerned the weekly pattern of class meetings. It might prove beneficial to hold these classes on Monday, Wednesday and Friday. Not having the class meet on Friday meant a breach in the continuous study of mathematics.

Conclusion

For students who were attempting college algebra classes without proper background, this co-course pilot proved very successful. Nontraditional students especially benefited from this academic assistance in this historically high risk mathematics course. As the traditional college age population continues to decrease through the early years of the 21st century, retention and student success will become more important. Developmental education and learning support programs can play a large part in this effort. By changing from the traditional model of developmental studies to learning support programs that can better meet the needs of students and universities, institutions of higher education can expand their efforts toward higher retention rates. Closer collaboration between learning support and core curriculum faculty created several fruitful by-products. This collaboration strengthened the ties between developmental and core course faculty. By working more closely, the faculty involved were able to better understand the curricula involved, their common goals, and the duties and responsibilities of each level of mathemat-

ics instruction. The strengthening of these links will provide added benefits to the students as well as the faculty and university.

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Foundations for a Constructivist, Whole Language Approach to Developmental College Reading

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Developmental college reading programs can be roughly categorized into discovery, skills, and whole language approaches. Debate in developmental education, as well as among those looking to revitalize their existing programs, often revolves around which approach is best.

We propose another way of looking at these instructional approaches. Rather than a collection of pedagogical strategies, these different approaches represent basic philosophical differences that are grounded in Western philosophy, in psychological interpretations as to how knowledge is acquired and in how students learn. Each of these views help to define the different sets of instructional practices. Because none of these philosophical views can be considered wrong, none of the three instructional approaches is wrong. However, we agree with Perry's (1970) assertion that once all views are understood and accepted, i.e., relativism, a commitment must be made by the developmental educator to impose a coherent order onto practice rather than using an eclectic combination of best practices.

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Rather than expanding on the discovery approach, which few developmental educators use, or on the skills approach, which has been explained extensively in the literature, we will focus on how a whole language approach is conceived from a constructivist psychological interpretation of a phenomenological philosophical position.

Philosophical View: Phenomenologicalism

Kant (1965) argued in his "Critique of Pure Reason" that whereas both rational and empirical views require that the individual go outside oneself in order to know the world (Fabricius, 1983), there is a different level of reality, how the world appears to the individual, which he labeled the phenomenological realm. Because our minds have the structure of space and time, we impose order and objectivity on experience. In other words, as we interact with reality, we use temporal (categorization, listing, comparison/contrast) or spatial (cause/effect, sequence) dimensions to make meaning of experience and to construct knowledge.

For example, we could come to understand the concept of a tree as we verify our understanding of an experience with trees and as we fit that concept into mental structures such as critical attributes of trees and changes in trees over time.

Psychological Interpretation: Constructivism

Near the end of the nineteenth century, attempts to understand how learning occurred in the mind led from epistemological philosophy to the development of the new field of psychology. Two psychologists in particular have interpreted phenomenolgicalism to explain learning and they have called it constructivism. Piaget (1970) goes beyond Kant to say that mental structures develop over time rather than existing *a priori*. External sense data must interact internally with these mental structures for learning to occur . Learning is therefore constructed through ordering and synthesizing through the senses, resulting in the reality that we experience (Fabricius, 1983). Vygotsky (1978) argued that constructivism takes place primarily through social interaction rather than primarily within the individual. Through collaboration in a meaningful social interaction the individual constructs a group meaning of a complex idea, which is in turn personalized to an individual meaning.

Pedagogical Adaptation: Whole Language

Educational implementations of constructivism have been labeled as whole language in reading instruction, process writing in writing instruction, and constructivism in math. Only recently has this educational philosophy emerged into practice in developmental education (Caverly, Mandeville, & Nicholson, 1995; Nist & Mealey, 1991).

Whole language has been primarily developed and practiced at the elementary level, where the focus is on narrative text and the use of story grammars to help students comprehend. To

apply whole language to comprehension of expository text requires some parallel work with text structure.

Applications to college reading instruction are determined by the task demands of college courses. Reading materials are the authentic required texts. Constructivism is both guided and social in its interpretation. Through guided constructivism, the instructor models processes and guides students to task awareness and eventually to task control. Rather than depending upon the individual to learn alone with the text, the social constructivist approach engages the learner's unique sets of experiences with those of others and the social context.

Guiding Tenets

Let us now turn to some conclusions drawn from a successful implementation of a constructivist, whole language philosophy. There are four research based tenets that we have integrated over a period of five years into the development of a constructivist, whole language reading program for college students.

Tenet 1: Developmental not Remedial

First, the role of developmental reading instructors at the college level is to teach and support students as they develop in their reading ability. Students who cannot read adequately to learn at the college level have developed in their use of language to a level that is inadequate to succeed in postsecondary education. They are developing in their ability to use reading as a means to learn. They range in this ability to read along a continuum from awareness of specific strategic processes for reading to learn; to procedural knowledge of how to perform these and other strategies at a cognitive level; to metacognitive and affective control over why, when, and where to use these strategies. Reading instruction from a constructivist, whole language perspective guides students to move along the continuum from awareness to knowledge to control by providing the social context of a collaborative learning community. The collaborative learning community supports the language functions of writing, speaking, and listening; thus the whole language nature of the approach.

Tenet 2: Strategies are Internal

Another tenet of our constructivist, whole language perspective is that reading strategies are internal cognitive, metacognitive, and affective interpretations of how to perform a particular learning process to satisfy a specific learning task. Both instructor and students (i.e., experts and novices) have strategies. The difference between experts and novices is the success of their strategies for specific task demands.

Reading strategies are a type of general learning strategies, but specific to text as a source of information, rather than a lecture, for example. Moreover, an important distinction between learning tactics and learning strategies have been echoed by several researchers over the years (Wade, Tratchen, & Schraw, 1990). A learning tactic is a given learning technique that can be

shared and discussed between the novice and expert. A learning strategy is mediational decision to orchestrate several learning tactics in an effort to develop knowledge (Derry & Murphy, 1986). Thus, reading tactics are our external interpretations of our internal reading strategies. Reading strategies are combined cognitive, metacognitive, and affective reading tactics applied to a given reading task.

We as experts help students construct strategies for reading by inferring what we do when we read, translating these inferences into specific cognitive, metacognitive, and affective tactics, modeling these tactics for students, providing an opportunity for students to explore these tactics within a collaborative group during a guided practice exercise, and providing an opportunity for students to continue to coalesce these tactics into their own strategy during an independent practice exercise.

Tenet 3: Scaffolds Foster Students as They Develop Strategies

Smith (1985) found experienced readers sometimes use support structures, i.e., scaffolds, such as knowledgeable others, dictionaries, or encyclopedias rather than depending upon their own resources when attempting to understand difficult material. These scaffolds need to be provided for inexperienced readers until their internal strategies are developed to the point when they can take control. To develop students' reading strategies, we teach a constructivist, whole language developmental reading course providing students with five scaffolds supporting them until they are able to construct their own support scaffold (Caverly, Mandeville, & Nicholson, 1995).

Text scaffolding: To provide an opportunity to develop academic literacy (Pugh & Pawan, 1991), we choose instructional material carefully, using authentic text chapters selected from college level textbooks used at our institution. We peruse the bookstore selecting text, such as chapters, sections of chapters, essays, and stories that support our instruction, we solicit publisher permission to duplicate these chapters, and then photocopy these for use in class. We choose specific texts ranging from considerate text, to less-than-considerate text, to inconsiderate text. Considerate text contains many explicit examples of the semantic and syntactic elements used in a particular reading strategy; less-than-considerate text uses fewer examples of these semantic and syntactic elements; while inconsiderate text has few if any examples.

To illustrate, one of our goals is to teach students to metalinguistically understand text structures. Therefore, we select a text that has sufficient explicit signal words that cue a reader to the text structure; a second text that has fewer signals; and a third text that has few if any such signals. These texts become part of a scaffold supporting the students as they become proficient in their use of a given reading strategy with the level of considerateness of instructional material waning as the students become more proficient. This leads students to assume their own responsibility as their text awareness scaffolds are developed (Wade & Reynolds, 1990).

Peer scaffolding: This allows students to support each other as they develop reading strategies. Building upon the theories of social constructivism (Vygotsky, 1978), we use collaboration between peers and one of our instructors to create a social, constructive, community of learners.

We place students into their zone of proximal development, pushing the limits of their reading ability (Vygotsky, 1978). Because students have the support of their peer group and their instructor within this community of learners, and they are allowed to collaborate on applying and testing out their developing reading strategies, students are able to understand more difficult text than if they were attempting it alone.

Teaching scaffolding: Initially, the instructor takes responsibility for students' strategic approaches to reading text. As students gain knowledge and control, they are released gradually to assume full responsibility (Pearson & Gallagher, 1983). We begin by modeling how we as expert readers would read a piece of considerate text using think-alouds to inform the novice students of our cognitive, metacognitive, and affective tactics within our reading strategy. Then we generate a large group discussion, asking the students to come to a consensus regarding the tactics we modeled. Next we have students practice the tactics in a guided practice environment consisting of small groups collaborating on an application, first within a considerate text and then in a less-than-considerate text. After the applications, we ask the small groups to collaboratively construct a consensus of both the content of the text and the developing reading strategy. Each small group reports its consensus to the large group, which then develops a large group consensus. Finally, we assign students to apply this developing strategy to textbooks from their other college classes, which are often less-than-considerate or inconsiderate text, as they independently practice the strategy. Moreover, we have students report back to us individually through writing a post-journal entry representing their understanding of the strategy. This scaffolding provides an opportunity for students to construct a strategy for reading from the tactics we have modeled, to test out that strategy and compare applications among a peer group, and to transfer the strategy to their textbooks from their other classes, testing it a second time. Students also complete a sustained silent reading (Brozo & Simpson, 1991) on African American and Hispanic autobiographical novels such as Maya Angelou's (1969) I Know Why the Caged Bird Sings and Gary Soto's (1985) Living up the Street. Each week we ask students to read a particular section of the novel, summarize that section, and then respond (Rosenblatt, 1978) to the novel. Through this activity, students are given an opportunity to transfer the reading strategies to general reading demands and to develop a lifelong reading habit as they come to identify with characters, other cultures, and themes of good literature.

Writing scaffolding: Students write journals on three occasions during the teaching scaffold. They begin with a pre-journal entry before the modeling stage in which they explore their prior knowledge of the strategy to be taught. Then, after the guided practice stage, they add in a peri-journal entry (adding more to their pre-journal) what new knowledge they have learned about the strategy and what old knowledge was confirmed or extended. Finally, after the independent practice, they document in a post-journal entry their developing understanding of the strategy after they have applied it to materials from their other college courses. This scaffolding allows meaning to emerge as the students interact within the social constructive community of learners (Brozo & Simpson, 1991).

Technology scaffolding: To facilitate learning and instruction, students use a simple word processor for journalizing. This word processor allows our students only to type and save a file;

no variations on text style or text fonts are available, simplifying the journalizing process. We have students share these journals after they have completed the independent practice. Then we give them feedback on their emerging control.

We also use an outlining software program for teaching text structure. We model how to use this program to generate a semantic map representing ordination (i.e., main idea/detail, subordination, co-ordination, and superordination) and relationships between concepts (main idea/detail, categorization, cause/effect, comparison/contrast, sequence, problem/solution). We teach students how to use this program, and have small groups of students in a guided practice environment map a considerate text and a less-than-considerate text, comparing the resultant maps of the different groups. Then we assign students the task of mapping a text from their other college courses. Eventually, we move students to paper and pencil maps.

Communicating over electronic mail (e-mail), students complete their sustained silent reading by engaging in book talk with developmental students at a college in another state (Peterson, Caverly & McKool, 1994). This extends the free reading experience to discussions about books like those in which many members of the literacy community are engaged.

We teach students how to access the world wide web to build prior knowledge and to develop specific concept knowledge (Caverly, Peterson, & Nicholson, 1995). Here, students search for concepts they deem important to the understanding of a piece of text but that were not adequately explained within the text. Then we have students add this new knowledge to the maps they have created from the texts.

Tenet 4: Student Control Over the Instructional Environment

To orchestrate this series of scaffolds as our students develop reading strategies, we help them first become aware, then gain knowledge, and finally take control over their reading strategies as they are implemented within a learning environment. We use a heuristic called a tetrahedral model of learning (Jenkins, 1979), which depicts the four variables present in any learning environment. We develop students' ability to manipulate these variables as they successfully implement reading strategies. This model has at its vertices self, text, strategy, and task. These four vertices interact and overlap creating four metacognitive dimensional planes (Wade & Reynolds, 1990). The self plane represents students' awareness of their reading ability, their interests, and their level of prior knowledge. To develop reading skills for learning, students must become aware of their abilities and interests, be provided an opportunity for improving this knowledge, and learn how to take control of their own learning.

The text plane represents the various contributions made by the author or publisher to the learning environment, such as complexity of the text, length of the text, content of the text, and considerateness of the text. Some texts facilitate learning while others hinder the process through the ease of readability and appropriateness of the text (Vaughn & Estes, 1986). Students need to become aware of the contributions of the text toward their understanding, learn how to use these contributions to understand, and how to take control when these contributions are available and what to do when they are not.

The strategy plane represents those current reading strategies students would use to read and study. Along with the other planes, students need to become aware of what strategies they are currently using given certain texts and certain task demands, learn other more effective and efficient strategies, and learn to take control over strategy selection based upon their competence, the text, and the task demand.

The task plane represents the academic task demands for reading ranging from recognition, to recall, to critical analysis, to appreciation. Students need to be aware of the expectations college professors have of their level of understanding and how those expectations change over the course of their college career. They must learn how to select a reading strategy depending upon their self contributions and the text contributions, and when, where, and why to adjust this selection as they satisfy both the professors' expectations and their own.

Implications for College Developmental Reading

These tenets imply a paradigm shift (Kuhn, 1970) in how college developmental reading is usually taught. They suggest changes in the assessment of students, the role of students in instruction, the materials used, the strategies taught, and the tasks required of students. Above, we discussed specific applications of those tenets. What follows is one way in which those tenets can be orchestrated into a college developmental reading program.

We began restructuring our college developmental reading program by creating a three institutional credit hour course. Students are placed into the course as a result of failing a state mandated test, the Texas Academic Skills Program (TASP; 1994). As a screening test, the TASP does not inform us regarding where students fall along the continuum of awareness, knowledge, and control of reading strategies. The difficulty with available commercial diagnostic tests is the inauthentic materials and tasks upon which the tests are constructed.

A constructivist, whole language approach requires some further assessment of student ability to read strategically in authentic text from college courses. To address this, we assign students to study a somewhat inconsiderate piece of text taken from a typical college textbook. They return for an exam the next class period when we ask them to recall points from the text as well as to interpret connections between these points through the use of a multiple-choice and essay test. Since our developmental students struggle with this task, generally failing the test, we place them somewhere near the awareness end of the continuum.

This failing experience, however, provides a teachable moment for us to develop student awareness. This task helps students become aware of what reading tactics they are currently using and the value of those tactics. Through a discussion of schema theory, we then help them become aware of other tactics such as considering their purpose for reading, considering their interest and attitudes toward the subject of the material, engaging their prior knowledge, and adding to and changing that knowledge. We then model for them how to construct reading strategies that incorporate all these tactics. We provide guided and independent practice experi-

ences for development of these strategies as they move from self-awareness, to self-knowledge, toward self-control.

Next, students develop text-awareness for the linguistic cues of college textbooks. We guide them to control the linguistic cues authors use to engage and build a reader's prior knowledge and then to develop concepts. Further, we guide them to control those linguistic cues authors use for structuring concepts into ordinal and relational patterns. Near the end of the semester, we guide them to control linguistic cues representing informational, narrative, and persuasive text. We model for them how to control the use of these cues and then provide guided and independent practice as they learn to adjust to varying degrees of self-control and text control.

Next, we develop strategy awareness about the variety of reading strategies that successful learners, i.e., experts, use when contributions made by the self and text vary. For example, we model how to perform one successful reading strategy for informational prose (PLAN; Caverly, Mandeville, & Nicholson, 1995). We provide both guided and independent practice as students move from awareness to control over this and other strategies.

Finally, students develop task awareness as they are exposed to the various reading tasks they will be expected to perform at the college level. For example, using actual syllabi and tests from lower and upper division courses at our institution, we discuss what the professors expect. Then, we compare the variety of strategies using a demand model (Caverly & Orlando, 1991), in which some strategies were found to be more efficient and others were found to be more effective. We model for them how to select a particular strategy depending upon the task demands of the teacher and the material within informational text.

We expand this model to include applying strategies when reading narrative text and then persuasive text. We provide guided practice and independent practice in which students develop first knowledge and then control over these strategies. We place them into a variety of task demand contexts, text situations ranging from considerate to inconsiderate, and self-control conditions ranging from high to low prior knowledge, interest, and attitude.

Conclusion

A whole language approach to developmental college reading is grounded in a commitment to a phenomenological philosophical position and a constructivist psychological perspective of how knowledge is acquired. It aims to guide students toward cognitive, metacognitive, and affective control over strategic use of print. Like reading recovery (Short, 1991), this developmental process cannot be completed in a single semester of instruction. Through this approach, developmental students are able to become self-improving readers capable of adapting to new and future demands.

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The Educational Experience of Nontraditional Age Female African American Students

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Each of us has the right and the responsibility to assess the roads which lie ahead, and those over which we have traveled, and if the future road looms ominous or unpromising, and the roads back uninviting, then we need to gather our resolve and,... step off that road into another direction (Angelou, 1993, p. 24).

Maya Angelou's statement captures the nature of the adult African American woman's decision and commitment to return to college. On college campuses, the population of nontraditional female students of color is increasing. The 1990 report of the National Center for Educational Statistics (NCES) indicates that from 1970 to 1989 the enrollment of nontraditional students grew 141%. The majority of these students are women of lower socioeconomic status (NCES, 1989). Two year institutions have been the primary delivery systems for this population since the 1960s and 1970s (Carpenter & Johnson, 1991).

Considerable research has been conducted on how women (Belenky, Clinchy, Goldberger, & Tarule, 1986; Ferguson, 1992; Robertson, 1993) and people of color (Tinto, 1987) perceive and respond to their educational experience. However, this previous research describes these groups

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generally. More specific research is needed. For example, Pascarella & Terenzini (1991) assert that "more research is needed to clarify the nature of the college experience and its effects on cognitive and psychosocial change among nonwhite students" (p. 644). There is an absence of research on the nature of the college experience for nontraditional age women of color in community colleges.

Review of the Literature

For purposes of this research, nontraditional refers to students over the age of twenty-five. They are likely to attend part time, to be female, and to be a member of a minority group (Hruby, 1985). Returning students may have a variety of reasons for taking advantage of educational opportunities. Merriam and Caffarella (1991) found that when asked to indicate the main reason for participating in educational endeavors, adults "cite job-related motives" (p. 80). Cross (1981) found that life situations directly influence adults' participation and that this is true regardless of race, gender or age. She explains that "People who do not have good jobs are interested in further education to better jobs. Women, factory workers, and the poorly educated, for example, are more likely to be pursuing education in order to prepare for new jobs" (p. 91).

Attrition among Students of Color

Minority attrition is a significant concern for institutional leaders. At predominantly White community colleges, only 10 percent of African American students who enroll in remediation programs are retained or graduated (Boylan, Bonham, & Bliss, 1992). Tinto (1987) explains that the student of color is faced with greater academic difficulties, incongruence, and isolation than other students. Academic difficulties are exacerbated when students come from disadvantaged origins and attend public schools of lower quality than do other students. This is the situation for many minority students. Tinto (1987) defines "incongruence" as the "state where individuals perceive themselves as being substantially at odds with the institution" (p. 53). Understandably, students who feel isolated in the academic or social culture of an institution will be more likely to withdraw from college before graduating.

Knott (1991) asserts that culturally diverse learners in a traditional classroom of White students may suffer from the "deficit perspective of cultural differences; those who do not fit the dominant culture are seen as different and that difference is labeled negatively" (p. 15). Knott explains that this rejection of culture can be damaging, forcing students to deny their own culture in order to adapt to the culture of the traditional classroom. This may lead to low self-esteem, low academic performance, and possibly to dropping out of the educational setting.

Attrition among Students of Nontraditional Age

Tinto (1987) explains that older students also face greater difficulties in persisting to graduation. Among nontraditional age students, the problem of isolation and incongruence is magnified. Older students may feel unable to fit in on a traditional campus. They may be unwilling to ask for help, or they may have responsibilities too numerous to allow them to persist.

Attrition among Female Students

Belenky, Clinchy, Goldberger, & Tarule (1986) discovered that women in general experience the greatest educational achievement when instructors "emphasize connection over separation, understanding and acceptance over assessment, and collaboration over debate; [and] if they accord respect to and allow time for the knowledge that emerges from firsthand experience" (p. 229). The ideal instructor is a "midwife" who supports student thinking.

The relationship that students form with one another influences classroom dynamics. Although there is little research on the relationship between women and their classroom peers, Belenky, Clinchy, Goldberger, & Tarule (1986) suggest that instructors should create connected classes to successfully address female students' needs. In the connected classroom, students and the instructor collaborate in the process of thinking and constructing new interpretations.

Statement of Purpose and Methodology

In a pilot study I have sought a beginning understanding of the educational experience of nontraditional age female African American students in a community college. I hope to provide insight particularly into the dynamics of classroom culture as it affects and shapes the educational experience of these students. To do this I have investigated how well teaching methods and classroom environment match academic needs. Although my initial focus was to improve instruction, I discovered more about the experience of African American returning women in education. I learned about the complexity of their lives and reached a greater understanding of their needs as students.

As an instructor of developmental education, I teach increasing numbers of nontraditional age African American women. In light of current research on women and culturally diverse learners, I wanted to ask these women about their attitudes and perceptions toward instructors and classroom peers. I could not be sure of correctly understanding their attitudes, perceptions, or experience by observing them as my students, so I chose a study in which they could articulate their experience.

The setting is a community college campus of approximately 2,500 students, located in a small town of approximately 12,000 residents. According to the college's Office of Institutional Effectiveness, student ethnic composition is approximately 7% African American while the ethnic composition in the institution's service area is 16.5% African American. Students over 24 years of age account for 16% of the student population.

I interviewed five returning women who had been my students in a developmental writing class and who were available and willing to participate. Each graduated from a public high school and is a first generation college student. Each has worked or is working at a state school for the mentally disadvantaged. One woman is in her mid-twenties. The others are in their thirties. Three are married, two with children. The fourth woman is a divorced mother, and the fifth is a single woman who lost a child in infancy. Prior to the interviews, each participant had completed at least two semesters of part time enrollment.

I conducted open-ended taped interviews during which I asked participants to respond to questions about their educational experiences. We discussed their secondary education, their most and least favorite classes in college, their college instructors, their classroom peers, their perception of themselves as students, their feelings about coming back to school, and how their education changed their view of the world. I was unable to conduct observations in other classes, so I asked them to keep a journal of their classroom experiences for the duration of the study, and two of the five committed to doing so. I analyzed the journals for emergent themes that might not have surfaced in the interviews. After reading my transcriptions several times, I developed follow-up questions that I asked the participants to respond to in journal form if I was unable to schedule a second interview. Also, I asked each to read her transcription to correct anything that she felt was inaccurate.

I analyzed the data using the constant comparative approach as described by Bogdan and Biklen (1992). As I reread the transcriptions and journal entries, I began to see common themes emerge. As they emerged, I recorded them on notecards and grouped them into categories. As I repeatedly reexamined the data, I revised the categories until several major themes became evident. The results of my analysis are presented below.

Findings

This study produced three major conclusions about the educational experiences of nontraditional age female African American students at one community college. First, the students appear to embark upon a winding road, which leads them to their enrollment in college courses. Along this road, enrollment decisions are paradoxical. These women are influenced by various forces that work both to pull them away and attract them toward academic work. Each woman must weigh her resources against her need to attain a higher education.

Second, the findings show that while in college each woman exhibits significant growth in independence, determination, and self-worth. This growth occurs despite the numerous difficulties of being students and in balancing life roles.

Finally, findings reveal in each student an inspiring interest in the world around them and altruism. Their generosity is displayed in the students' career goals and in their relationships with others on campus.

I have changed the names of all participants to protect their identity.

Traveling the Winding Road

Since these women seemed committed to their education, I wanted to know what kept them from entering college right after high school. I discovered that although most had a desire to go, family responsibilities and other influences intervened. Both Latonica and Tonya married and started families immediately after finishing high school. Tonya describes how raising children can prevent a mother from attending:

> By that time I already had one child, and I had gotten married. I had my second baby, and then I wanted to go to school, but I always said, Well, now I have a kid, and I can't go to school, or I don't have enough money, and I can't go to school. I have two kids.

Janet describes how her obligations to family members kept her from going to school, despite the fact that her mother wanted her to go:

> When I graduated, she [Janet's mother] was sickly, and my dad had passed. And then I had my little sister there, and so I just stayed home and worked and helped take care of my little sister.

Rhonda's situation at home was also an inhibiting factor, but in a different way; her mother and father had never pushed her and her ten siblings to go to college. She explains, "I had other things on my mind besides going to college. I wanted to get married, so I married my husband."

Significant life roles were a detour away from college. Family responsibilities such as caring for ailing parents or younger siblings took priority. All but one of the women I interviewed grew up with both parents in the home. Their immediate role models influenced their behavior. Thus, the traditional roles of being wife and mother took precedence over attaining higher education.

Ironically, family influences that kept each of these women from going to school initially became the support that each needed to make the decision to turn back to school. As Tonya explains, her mother's influence pushed her toward college:

> My mom goes, "Why don't you go back to school?" I said, "Who's going to pay for it, number one? Who's going to keep my kids? And when I go back, am I going to be able to keep my grades up like I did in high school?" I really kind of defeated myself like that in my mind. And finally she said, "Why don't you go up to the school and see what they say?" So I came up to the school one time on my own and did an assessment [test]. That was before I enrolled. And I did real bad. I said, "Oh no, I can't go to school. That's out of the question." My mom said, "Why don't you try it again?" So I went back a second time, and it wasn't too much better. But I went ahead and enrolled anyway. That was in the fall of '92 when I did that.

For Janet, maternal support influenced her commitment to continue her education even in her mother's absence. When asked what keeps her going to school while working full time and taking care of a little sister and several nieces, Janet responds,

> I think it has a lot to do with my upbringing because my mom—she always said that she wanted us to have more education than she had because she only went to the eighth grade. And she emphasized on education a lc. And she was kind of disappointed when I didn't first go outside of high school, but I always told her that I was going to go. But she never did get to see me go, so I guess that kind of keeps me going.

For Trisha the support of her husband was the deciding factor that enabled her to commit to going to college:

> Well, when I was at work, I worked with a student at Community College, and she told me a little bit, and I said "I'd like to go back to school." And she said, "You know, it's never too

> late to go back to school." So, she asked me what I'd like to do, and I said, "I'd really like to be a teacher." She said, "Well, you should go," and I said "No, I can't do that." And, she said, "You should try it." And, so, I just decided to talk to Community, and they told me to apply. I took my assessment test, and after I took it, I thought, "Oh no, I can't do this." And my husband didn't believe that I would do it. But I told him I was going to take the test. When I did, I told him, "I don't think I'm ready for this," and he said, "Oh, yeah, you can do it." And, I said, "Okay, if you think that I can do it, that's fine." And, I been here ever since.

Family support may be seen as a means by which each gave herself permission to attend. This supportive influence enabled each to overcome her uncertainty about enrolling. The most influential people in this decision were mother and spouse.

Once these women became students, instructors were their most valued resource. Tonya relates how one instructor validated her experience, thus making her feel respected:

> It's interesting because the way he comes in the class. Like, I remember the first day he talked about Life. To me, it's a lot of young people in my class, but he makes older people feel like you have something to add to his class. . . . He'll be talking about something that maybe they haven't experienced, or maybe they don't have kids. A poem that's talking about that people should take more value in everyday life. Don't take it for granted. Whereas the younger students, they really don't think about that right now because they don't have to pay for their education, or they don't have anybody to worry about except themselves. Whereas you appreciate what he's saying. You can understand what he's saying, and you can relate to him.

Trisha values her instructors' guidance and belief in her ability to succeed:

> They are all helpful. Whenever I've asked, they've been there for me. . . . They see the abilities that I have to better myself, and they show me what I need to do to better myself, and that's what I really like about the teachers.

The others commented that the instructor's willingness to answer questions, cover the material slowly, and give individual attention were characteristics that influenced and reassured them. They described how instructors created positive classroom experiences, a climate in which each felt that she could succeed.

Besides significant others and instructors, personal issues made college an appealing option. Each of the women articulated a perception of need, a feeling of "looking for something," that predisposed college enrollment. For Janet, especially, the opportunity to enroll was a healing one. Describing events in 1993 that prompted her enrollment, she narrates,

> I just—I had just been down. In '92 I had a baby, and she only lived for seven months. And I had just been down in the dumps, and I just needed to get myself back up and I figured that was the way to—And then it was just like—really, it was like to fill my days up to get my mind off of it and stuff and to stay busy. And I said that's about the best way to do it, is just to stay busy, is to go to school and stuff.

For Latonica, going to college became an answer to her dissatisfaction with the traditional roles of being wife and mother to two teen-age girls. She explains that she would often share her dissatisfaction with her husband:

> I used to tell him because sometimes I would just sit down, and when I said I wanted to go, I felt like crying because I felt like I could do something better. I wanted something out of life and not just being a housewife. Because you don't get too much out of just being a housewife. You know, some people do, but I feel that I wouldn't.

In the college setting, dissatisfaction disappeared; attendance could be therapeutic, leading to a renewed sense of drive and ambition. When these students found themselves needing something, going to school filled that need and changed them.

Each participant was asked how she saw herself as a college student and how she felt her experience changed her. The responses indicate that each person had maintained strong convictions about getting a college education prior to her enrollment. Each also experienced personal growth as a result of her experience as a college student.

Trisha explains that her experience in college has helped her to become a determined, motivated person:

> Determined to get what I should've got eleven years ago: an education. I find myself getting more motivated to learn than before. You know, I guess I'm learning to do more than, you know, doing math and stuff like that, stuff I thought I knew but I didn't, writing essays and stuff like that. I find myself putting more time into my essays and trying harder. I'm a more motivated person.

Having access to higher education is more than just an economic advantage. It is a chance to heal, improve, and build the whole person. It is a liberating experience, and most students in this sample appear to realize that is so. As Rhonda relates, "I am proud to be in college." It is no wonder then that these students are motivated and determined to persist.

Responding to Perceived Discrimination

Two of the women experienced a negative relationship with an instructor, which they perceived was caused by either their race or their gender. Tonya describes a negative experience that she had in a government class:

> Well, at first we started out kind of rocky because I think he took me, we would have discussions in class, and I thought he had problems with black women, or women period. I think he was prejudiced against females. Because when we were having conversations in class, he really didn't want any ladies saying nothing. When we were talking, he would listen. Then he would ask another guy, and they would talk about what he said. Finally, a lot of us females got together and said, "I just kind of think he don't care what we think." I said, "You know what, I kind of got that feeling, too. I just wasn't going to say that." I think it was pretty much true. He just didn't have a high regard for females. Females, yeah you're here to learn everything, but you kind of need to stay in your place. I even know when we did sev-

eral presentations in his class, we had props, went and got outside sources, and made drawings and diagrams. And they [male students] didn't do nothing. They just got up there and read a paper, and they got lot higher grades than some of us. And we went out and worked and prepared for it and everything. I didn't feel we got the grades we deserved.

Trisha experienced race and gender discrimination in a history class:

I'm taking Texas history this semester. And, it may be just me, the way that I'm feeling, but I'm the only Black in the class. And, I feel that Dr. Prof., you know, overlooks me. And, I sit in the front of the class to his left side. And, sometimes he makes rude remarks, especially when it gets to a topic with women or with stuff like that and he really emphasizes, you know, all that topic, and still I feel that he overlooks me. For example, he asks the students to read out of the book, you know, in the classroom. We've been in school for about eight weeks, nine weeks now, and he has yet to for the first time call on me to read.

Both women appear to have a healthy way of dealing with the discriminatory behavior of instructors. Each meets the situation with self-confidence, or a "There's nothing wrong with me" attitude. When asked how they were able to maintain this attitude, both described the support of significant others, religious faith, and the necessity to fight injustice. These convictions help them handle disrespect.

Not surprising then, these women are very independent students. They do not generally seek to establish relationships with older students or other classmates. It appears that feeling isolated led them to develop a very strong sense of independence. Tonya describes why she has developed her independent nature:

I think it really kind of depends on the people. Some people they kind of give you the idea that you're not so smart, that you probably wouldn't know. Unless the teacher has something to do with the group. And then a lot of older people they have their own little clique you know. I consider myself older, but they're older than I am. So I kind of don't fit there either.

Achieving Academic Autonomy and Interdependence

Trisha explains that although she is by nature independent, she has had experiences in college classes that have taught her to rely on herself as a student:

I was having trouble with algebra. There was this one girl. She wasn't having any trouble with her work, and Ms. W. says, "Why don't you get together with this girl? She can help you with what you don't understand, and maybe you can help her with what she don't understand." So, we said, "Okay." You know, well, I say, "I'll give you my number. You give me yours. We'll get together, and you can show me what I'm doing wrong," and I wrote it down and everything and put it on the table, and after class was over, she got right up and left and just went out. And it looked like she didn't have the time or she didn't want to show me. So, that, to me, that tells me, "Hey, if I'm going to get it, I need to get it on my own." So, after that, I really don't try to talk to anybody. I just go to the teacher.

Being independent seems to be a well-developed survival strategy. Each woman has related instances in which she had only herself to depend on. When this was also her experience in college, she used the same strategy.

Contrary to expectations, these women tend to remain nurturing to other students even when they fiercely maintain their independence. Nurturing is primarily targeted toward other female students. Tonya relates how she tries to help others:

> And along the way if I can help somebody, I will. If I see somebody, like earlier part of the semester I knew a student here who went to the same [high] school that I went to. She was saying she just didn't want to go to school. She didn't think she could do it. She's fresh out of school. I said, "You live in a dorm room, and everything's paid for. You've got everything going for you. You ain't got no kids. What's the matter with you?" She said, "I think I'm just doing it for mama." I said, "Well, you have to do it for yourself. If you're not doing it for yourself, there's no point in doing it because you're going to quit halfway through." "Well, I don't really have any kind of strategy. I don't know what I want to be. I think they're messing me around." I said, "Well, the only person that can mess you around is yourself because you have to have a strategy. You got to know what you want." I haven't seen her anymore this semester until yesterday, and she seemed so positive. She really was in control of what she was doing.

For Janet, nurturing is a two-way activity. She communicates that she tends to make friendships with other female students whose situations match her own. She recounts,

> I had one [classmate my own age] in my English class and we tend to—we just tend to work together because she worked full time. We worked at kind of the same kind of place, so we studied together and stuff. And it was just, I don't know, easier. And she understood where I was coming from, and I understood where she was coming from; how important it was and stuff.

At the same time, Janet is very understanding of traditional age students. In describing students who give the teacher a hard time or who don't care and come late to class, she explains, "I remember when I was in [high] school, I used to be like that. But now, I mean, I take it more serious. I'm like, well, one of these days they'll understand how important this is."

It appears that nontraditional age students for the most part are well aware of the differences in maturity level among their classroom peers. They are tolerant, understanding, and willing to help and advise.

Enhancing Global Awareness and Altruism

When asked if their educational experience had influenced their outlook on the world, these women were quick to relate that their experience had caused several positive changes. Tonya describes how she developed a new feeling of being a thoughtful, involved citizen:

> I registered to vote. I know all about how it goes. The primaries that were yesterday. Knowing how the democratic stuff goes, how the system works. Before I really didn't. It may

be a little bitty part, but I have my say. That's important to feel that you are a part of your government and you do play a part. . . . And even if they [politicians] don't do it, well, you still have your say which makes you a part of your government. I find myself reading Time magazine and reading papers and getting more involved in what's going on around me. Also, I like to listen to CNN and different news channels to see what's going on in other parts of the world. If it's not a foreign name, I kind of know where it is and what's going on over there. I can relate real good because I took one class in geography. I can pretty much know where it is. What's going on over there. About some other cultures and stuff. It's not just I'm just tired of hearing them people. I can sit there and look at the news for over an hour, and I like it.

Rhonda recounts how a childhood dream to help the elderly is now coming true for her:

When I was in elementary, we had to write this paper of what we wanted to be when we grew up. And I chose nursing because that's what I've always wanted to be. I've always wanted to be a nurse. But, you know, as you got older—as I got older, I forgot about it until I went to [work in] a nursing home. And now I'm a med aid, and I see a lot of things that I cannot do that I wish I could do; a lot of patients that need help and a nurse cannot get to them right now. So I just want to be a nurse. I just want to be there to help someone. And a nursing home, I like being around working with people. That's just been my goal. It's just on my heart to be a nurse.

Trisha explains that her educational experience has caused her to realize that she has a responsibility to pay back to society. She has recognized how members of society are interdependent:

It's [education] a tool for me to get what I need. You know, a way for me to get, well, OK, let me put it to you this way. I've been working all my life, and I've been [working] at the state school. I got my child, husband, and that. I got to a point where I didn't want to work there anymore. And I looked at my need to receive a college degree and be a teacher in order to think that I am somebody. You know, I'll be helping other people. You know, like my teachers are helping me now. I think that college is really a way to help the world. . . . You know, I look at my daughter and, you know, I say, you know someone's teaching her and by me being a teacher, I can help someone just like her. It's just, you know, it's just a give and take thing. Someone's giving to me, and I want to give back to her child.

For these women, giving back means being a productive citizen. Although they have had to learn to be independent and self-reliant, they still believe in and need to connect with others in the world around them.

Summary and Discussion

According to the findings of this study, various forces work together to shape the educational experience of nontraditional age female African American students. The findings suggest several ironies in each woman's experience. First, significant others provide both the influence to

postpone enrolling in college and the support to go. Individuals in this culture feel a strong sense of responsibility for each other's happiness and well being. This responsibility deters women from focusing on themselves. Alternately, supportive influences of family members give the participants permission to pursue their desire to be college students. This ongoing process of give and take results in the "winding road" metaphor that describes the African-American woman's educational experience. Although it is a reasonable, often necessary, process for women seeking higher education, attrition is an ever-present possibility.

Second, participants have experienced both positive and negative relationships with faculty and students. Although most interactions with faculty members were positive and nurturing, these students were able to endure those that were not without being personally damaged.

In light of research on women's ways of knowing it is surprising that these women did not necessarily seek out other students in class. In fact, two discoveries warrant attention. First, these students seem to have a strong sense of self-reliance. This is evidenced by the tenacity in which they tackle problems. Second, they seem to possess a strong sense of self-worth. When they perceive themselves to be treated badly or ignored, they do not blame or feel sorry for themselves. Rather, they pity the misguided and continue to nurture others, particularly other female students.

The findings suggest that these women are convinced of education's positive influence. It is apparent that these women have achieved balance in their lives as students. It is this balance that allows them to nurture their classroom peers and rely on themselves.

The last set of findings suggests that they have developed connectedness in society as a result of their educational experiences. Participation in higher education is a source of healing, satisfaction, and personal growth. It also influences these women to see themselves as contributing members of society. These findings suggest the importance of promoting positive attitudes and experiences in the lives of nontraditional age African America female students. They also suggest these students' strength of character and commitment. Their ability to be a source of support to other students is significant.

Getting these stories was a very challenging task. Initially, nine women agreed to be interviewed for this study. However, of the four I did not include, one was involved in a serious car accident and could not complete the interview process. Two were employed full time and commuted some distance to work and school. Their time was too limited for them to participate. The last was overburdened with the caretaking needs of an aging parent, a sister with AIDS, and several nieces and nephews. The stories of these four provide an important finding as well. The educational experiences of this population of students are fraught with difficulties and barriers. That many persist to graduation is proof of their strength, determination, and ability. It is important to accept that some drop-out due to factors beyond the institution's control.

In the light of important barriers such as full-time employment, caretaking, and child rearing that can prevent pursuance of an education, significant others in these women's lives must be encouraged and recruited by the educational community along with those who actually enroll.

Doing this may help community colleges to retain this population of students through graduation.

In a time when legislators are scrutinizing funding for higher education and programs like developmental education are particularly at risk, the hopes and dreams of student populations such as this one must be heard. Without programs that allow these students to reenter the college community, the world stands to lose more productive, responsible citizens. Their continued enrollment may even lead them or their children to career choices beyond these that are traditionally pursued by African American females (Payton, 1985).

Recommendations for Further Study

More research on this topic is needed. This study needs to be replicated with larger numbers of participants to test the accuracy of the findings. Research needs to delve into how participants develop their strong convictions to go to school, as well as how they develop their strong sense of self-worth. This information would be invaluable to all those involved with or responsible for higher education.

A primary limitation of this study is the absence of a control group. To what extent are these findings true of all nontraditional students, regardless of race or gender? Further research is needed to establish the uniqueness of these findings to the nontraditional age African American female student's college experience. Further research is also needed to understand how participants develop their strong sense of self-worth. This information would be invaluable to all those involved with our responsible for higher education.

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Defining Developmental Education: A Commentary

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Among the meanings of "develop" are "to evolve the possibilities of...to promote the growth of" (Webster's New Collegiate Dictionary, 1981, p. 308). "Development" is defined as "the act, process, or result of developing" (p. 308). "Remedy," meanwhile, refers to "a medicine, application, or treatment that relieves or cures a disease...something that corrects or counteracts an evil "(Webster's New Collegiate Dictionary, 1981, p. 970). To remedy is "to provide or serve as a remedy for" (p. 970). Synonyms are cure and correct. The definition of remedial has been expanded to not only include "intended as a remedy," but more specifically, "concerned with the correction of faulty study habits and the raising of a pupil's general competence (~reading courses)" (p. 970).

How do we want to define ourselves? Is our mission to promote the growth of students to their highest potential, or to correct a previous wrong? As Payne and Lyman point out, the answer to this question has significant political and budgetary ramifications as well as considerations for how we perceive ourselves as educators.

Previous published articles present the theoretical foundation for student development and its application to developmental education (Dwinell & Higbee, 1990a; Higbee, 1988, 1993; Higbee, Dwinell, & GoldbergBelle, 1990). Among the most widely cited and researched of the founding theorists is Arthur Chickering (1969; Dwinell & Higbee, 1990b, 1991, 1992; Higbee & Dwinell, 1992). Chickering, together with Linda Reisser, (1993; Reisser, 1995), has recently revisit-

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ed his original theoretical proposals in an effort to respond to what Darby so appropriately describes as the disequilibrium inherent in working with students during a period in their lives that is charged with opportunity for growth. This disequilibrium is intensified by interactions with a world that is in a state of rapid change socially and politically as well as technologically.

Seven Vectors of College Student Development

Chickering's (1969) seven vectors of college student development have withstood the test of time. Perhaps the most significant addition to the second edition (Chickering & Reisser, 1993) is the recognition that a theory originally written to address the developmental needs of the traditionally age college students of the 1960s can be equally pertinent to students of all ages in the 1990s. Although some of the terminology has changed, the vectors remain remarkably the same.

Developing Competence

This vector includes intellectual, physical and manual, and interpersonal (previously termed social) competence. Reisser (1995) describes three areas of intellectual competence:

1. the acquisition of subject matter knowledge, and of skills tied directly to academic programs
2. the growth of intellectual, cultural, and aesthetic sophistication, expanding interests in humanities, performing arts, philosophy, and history, and increasing involvement in lifelong learning
3. changes in ways of knowing and reasoning; the development of skills like critical thinking and reflective judgment; and increasing ability to locate and use new information, to analyze objectively and draw conclusions from data, to solve problems, to generate questions and answers, to communicate proposals and opinions, and to develop new frames of reference (p. 506).

Developmental educators can make significant contributions to student growth in intellectual competence. By engaging students more actively in the learning process, whether through cooperative learning ventures like that described by Myers, modeling behaviors and scaffolding as delineated by Caverly and Peterson, providing additional learning opportunities like Stratton's co-requisite course, or other creative means of teaching, developmental educators can promote the development of critical thinking and problem solving skills while also teaching specific skills in content areas. Collaborative learning also enhances interpersonal competence. As expressed so eloquently by some of the students quoted by Chumchal, participation in developmental education programs can lead to substantial gains in sense of competence, or confidence in one's abilities, and provide the motivation and courage to take the next step.

Managing Emotions

Chickering and Reisser (1993) expand on Chickering's (1969) earlier work to include the trials and tribulations of returning adult students. Reisser (1995) states, "In the new edition we contended that age does not necessarily correlate with emotional maturity, and we addressed a wider variety of emotional baggage that younger students and returning adults bring to college" (p. 507). Chumchal's findings certainly support this viewpoint.

Moving through Autonomy toward Interdependence

One of the primary changes in the second edition of Education and Identity (Chickering & Reisser, 1993) is a greater emphasis on interdependence, the recognition that we can achieve emotional and instrumental autonomy and still rely on one another for support. Another significant change in the new edition is the acknowledgment of potential gender differences in approaches to autonomy and interdependence (Gilligan, 1982).

Developing Mature Interpersonal Relationships

Reisser (1995) acknowledges "that relationships provide powerful learning experiences about feelings, communication, sexuality, self-esteem, values, and other aspects of identity, for both men and women" (p. 508). A critical function of the college experience is to promote acceptance of individual differences and an appreciation for cultural diversity, which in turn can lead to a greater capacity for intimacy. To sustain mature interpersonal relationships students must be capable of trust, open and honest communication, and unconditional positive regard.

What and how we teach can have a significant impact on students' attitudes toward others. We have the opportunity to address topics such as racism and sexism in a manner that is nonthreatening, especially given the smaller size of the typical developmental education class and the opportunities for collaborative learning. This is yet another way in which we can promote student growth beyond the content areas of English, mathematics, and reading.

Establishing Identity

Reisser (1995) proposes, "Any experience that helps students define 'who I am', 'who I am not' can help solidify a sense of self....Personal stability and integration are the result" (p. 509). When a student has achieved a stable and realistic self-image, new challenges will be less threatening, and the student should be better prepared to respond to new ideas and concepts or conflicting values and beliefs.

Developing Purpose

Although this vector involves educational and vocational planning and making lifestyle choices, it also focuses on establishing priorities. What is really important in life? What would you really like to accomplish? I always tell my students that I have only two goals that really matter to me, to be a good mother and to touch my students' lives in "little ways." I hope I have a positive influence on the development of my students as well as on my own children. This is my purpose in life. I want my students to think beyond what kind of job or income they want, or what kind of house or car they desire. What gives life meaning? Life is precious and unpredictable. If you died tomorrow, what would you want people to say about you?

Developing Integrity

This final vector is reflected in student values: (a) humanizing values, which are relative rather than dualistic (Perry, 1970), and (b) personalizing values, which refer to the process of "affirming one's own values and beliefs, while respecting others' view points" (Reisser, 1995, p.

510). Perhaps most important, however, is achieving the congruence between values and behavior that truly signifies integrity.

Conclusion

Why do we call ourselves developmental educators? Hopefully, because we envision our mission as the development of the whole student, not just the development of intellectual competence. I would like to think that our profession exemplifies not only excellence in teaching our content areas, but in educating well-rounded individuals who will emerge from our colleges and universities prepared for the years to come. Pardon me if I bristle every time I hear someone refer to what I do as remedial. My students are not sick, and they do not need to be cured. They are evolving, and the possibilities are limitless.

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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 the individual differences and special needs among learners.

Developmental Education

programs and services commonly address academic preparedness, diagnostic assessment and placement, affective barriers to learning, and development of general and discipline-specific learning strategies.

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