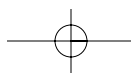
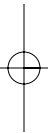
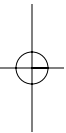
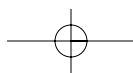
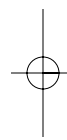
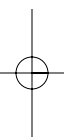
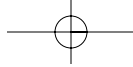


PART ONE
INTRODUCTION





CHAPTER 1

Current Perspectives in Educational Psychology

WILLIAM M. REYNOLDS AND GLORIA E. MILLER

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The field of educational psychology traces its roots to some of the major figures in psychology at the turn of the past century. William James at Harvard University is often associated with the founding of psychology in the United States with his influential books of the late 1800s. Other major theorists and thinkers that figure in the early history of the field of educational psychology include G. Stanley Hall, John Dewey, and Edward L. Thorndike. Hall, cofounder of the American Psychological Association and its first president, was a student of James. Dewey at the University of Chicago was one of Hall's students and introduced major educational reforms in the United States. Thorndike, whom we often associate with theories of intelligence and learning, was also one of James's students and went on to start the *Journal of Educational Psychology* in 1910. Similarly, the impact of Lewis Terman (Terman & Childs, 1912) on the field of educational psychology and the assessment of intelligence (as well as related areas

such as educational tracking) was monumental at that time and throughout much of the twentieth century.

Other influences on educational psychology, and its impact on the field of education, have been linked to European philosophers of the mid- and late nineteenth century. For example, the impact of Herbart on educational reforms and teacher preparation in the United States has been described by Hilgard (1996) in his history of educational psychology. Largely ignored by Western psychologists until the 1980s, the work of Russian psychologists in the early twentieth century—in particular the work of Lev Vygotsky (1978, 1926/1997)—also contributed to the field of educational psychology. As readers of this volume will find, the work and influence of Vygotsky permeate research in educational psychology in the United States at the end of the twentieth and into the twenty-first century.

This volume of the *Handbook of Psychology* does not delve into the historical foundations of educational psychology, but

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rather deals with exemplar research and practice domains of educational psychology in the latter part of the twentieth century, with a focus on research and trends that have promise as we begin the twenty-first century. Historical antecedents of this field of psychology are presented in volume 1 of this Handbook.

It is evident from the chapters in this volume that much of the research in educational psychology has been conducted in classroom settings. This research encompasses a broad range of related topics, including children's learning and abilities, classroom processes, and teacher effectiveness. Educational psychology has been described as a discipline uniquely focused upon "the systematic study of the individual in context" (Berliner & Calfee, 1996, p. 6). The long-term focus on the study of children in classroom situations assists in the direct translation of research to practice.

From a pedagogical perspective, educational psychology differs from most fields of psychology in that it is most often found as a separate department in universities and colleges. To some extent this reflects the diversity of research and academic domains within educational psychology, as well as the rich and applied nature of this field of study. Departments of educational psychology are most often found in colleges of education, and courses in educational psychology are typically required for students in teacher education programs and related majors.

The field of educational psychology has ties to many professional organizations and professional societies in the United States and other countries. In the United States, the two major organizations that represent the field of educational psychology are the American Psychological Association (APA) and the American Educational Research Association (AERA). In the APA, educational psychology has as its primary affiliation Division 15 (Educational Psychology) with secondary affiliations in Divisions 5 (Evaluation, Measurement, and Statistics), 7 (Developmental Psychology), and 16 (School Psychology). In the AERA, Division C (Learning and Instruction) largely represents educational psychology with additional representation in Division D (Measurement and Research Methodology), Division E (Counseling and Human Development), and Division H (School Evaluation and Program Development). We also note that a number of educational psychologists, including Lee Cronbach and Frank Farley, have served as president of both APA and AERA, with Cronbach also serving as president of the Psychometric Society. Other professional organizations that have substantial overlap with educational psychology include the International Reading Association, the Council for Exceptional Children, the National Association of School Psychologists, the Psychometric Society, the Society for Re-

search in Child Development, and the Society for Research on Adolescence.

Contemporary educational psychology encompasses a broad and complex array of topics, research, and social policies. Research in educational psychology is most often designed to provide insights into authentic educational problems, using empirical rather than normative or subjective judgments. The field of educational psychology—possibly more than any other—has been shaped by many multidisciplinary factors. The impact of the cognitive revolution, for example, has been broadened by incorporation of other sub-disciplines, including sociology, linguistics, the sciences, philosophy, and the associated fields of psychology. The major focus of educational psychology, however, is on individuals and their development, especially within educational settings. Another important characteristic of the field of educational psychology is that issues of concern are not mutually exclusive and in fact tend to overlap and interrelate more than stand as isolated domains of knowledge.

The field of educational psychology includes a rich heritage in the domains of research design and methodology, including statistics and measurement. For most of the twentieth century, educational psychologists have contributed to enhancing statistical and measurement procedures. In the 1950s educational psychologists published two articles reporting on statistical and measurement procedures; these articles have become among the most frequently cited ones in psychology. Cronbach's (1951) classic paper on the internal structure of tests and the derivation of coefficient alpha as an internal measurement of reliability continues to be one of the most cited papers in the behavioral sciences and most used procedure for the measurement of test reliability. Henry Kaiser's (1958) dissertation in educational psychology at the University of California at Berkeley provided the basis for an orthogonal rotation procedure in factor analysis that he called varimax factor rotation, with various little jiffy procedures to follow. These are but two of the many statistical, measurement, and methodological contributions that have been and continue to be made to the fields of psychology and behavioral and social sciences by educational psychologists.

CURRENT PRESENTATIONS OF THE FIELD

A comprehensive review of major work across the field of educational psychology was presented in the publication entitled *Handbook of Educational Psychology*, edited by Berliner and Calfee in 1996. This influential handbook, sponsored by the APA division of Educational Psychology (Division 15), was commissioned to reflect the current state of the field up to

the early 1990s. Berliner and Calfee provided a powerful synthesis of the scholarship that defined the scope and relevancy of educational psychology as a discipline up until this time. The major goals of this volume were to offer a vigorous defense of educational psychology as a discipline and to forward the distinctive viewpoints that educational psychologists maintain when explaining educational events. Chapters were organized to represent the major domains within the discipline. Authors were asked to discuss how coverage of these topics changed from 1970 to 1990 and to summarize significant changes in research design within the discipline. The following domains were covered: learning and transfer, motivation, physical and psychological development, intelligence, exceptionality, psychology of learning within subject matters, assessment, processes of teacher growth and development, the psychology underlying instructional strategies, educational technology, and the methodological, philosophical, and historical foundations of the field.

Several consistent conceptual threads ran through the majority of invited chapters. One was the critical paradigm shift from behaviorism to cognitive psychology that shaped the discipline over the period covered. Another commonality across topics was that this conceptual shift resulted in a vigorous debate regarding research methods. What has emerged is a greater range of analytical tools—a methodological pluralism marked by some promising new practices such as exploratory data analysis (Jaeger & Bond, 1996) and design experiments (Brown, 1992). In drawing conclusions about the field, Berliner and Calfee suggested that the discipline's bread-and-butter issues had not changed as dramatically as did the conceptual and methodological tools that educational psychologists employ to understand educational phenomena. They also concluded on a note of congratulatory celebration at what educational psychology as a discipline has contributed, and they looked optimistically to its future.

More recently, Pressley and Roehrig (2002) provided a synopsis of the major domains reflected in the field of educational psychology during the last 40 years. These researchers categorized all research articles published in the 1960–1961 and the 1997–1998 issues of the *Journal of Educational Psychology*, the leading journal serving the field. Domains of information reflected in three contemporary handbooks and textbooks were also categorized, and editorial board members of the *Journal of Educational Psychology* were surveyed for their opinions of texts and articles that had the most significant impact on the field. The consensus of these reviews is amazingly similar in that at least 11 consistent domains appear: cognition, learning, development, motivation, individual differences, teaching and instruction, classroom and

sociocultural processes, social relations in education, psychological foundations of curriculum, educational technology, and educational research methods and assessment.

These authors also noted that behaviorism and then the cognitive revolution were two critical forces driving the field, with the former more prevalent before the 1960s and the latter dominating the last 40 years (Pressley & Roehrig, 2002). Many significant changes were noted that led up to this change, beginning with the idea that an internal processing system and internal mechanisms could be objectified and studied (Miller, Galanter, & Pribram, 1960, *Plans and the Structure of Behavior*) and followed by work centered on memory (Tulving & Donaldson, 1972), imagery (Levin, 1973; Paivio, 1971) and other learning processes (Rohwer, 1970; Schank & Abelson, 1977).

Instructional theory and innovations were impacted by Bruner's writings (1960, 1966), as well as the work of J. M. Hunt (1961) and J. Flavell (1963), who together with others (Brainerd, 1978; Inhelder, Sinclair, & Bovet, 1974) helped introduce and transform Piaget's ideas into work on children's thinking. Others' work was more directly linked to educational application, especially in regards to observational and social learning (Bandura, 1969; Rosenthal & Zimmerman, 1978), text comprehension (Anderson & Pearson, 1984; Kintsch, 1989), writing (Flower & Hayes, 1980), problem solving, and mathematics (Mayer, 1976; Polya, 1957; Schoenfeld, 1985).

Sociocultural and cross-cultural contexts were introduced as important factors influencing learning and cognition. Schooling and other critical contexts have been more prominent in the field since the pioneering work of Scribner and Cole (1981) in the 1980s and the influence of Vygotsky's work with the 1978 translation of *Mind in Society*. This work has helped to reconceptualize instruction and teacher training as well as related domains of cognitive psychology. It has moved the field from an individual focus to a broader interpersonal framework. Much of the current research reflects the idea that the child, adults, and the contexts surrounding an event are responsible for forwarding cognitive activity and building competence. These ideas have been inspired by Vygotskian theory and have contributed to substantial reforms reshaping contemporary school environments. They have had a direct impact on the design of instruction and have had a profound influence on educational research innovation. The linkages between theory and teacher learning, teacher and student relations, and the social climate in classrooms have all become more significant domains of study within the field of educational psychology. We find it of interest to note the extensive citations to the work of Vygotsky across many of the chapters in this volume.

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Theories of motivation and its effect on cognition, learning, and social relations have also been more prominent. Historically, the work in educational psychology was dominated by an emphasis on cognition; motivation was ignored. Recent work has pointed to the importance of motivational constructs that apply to all individuals and that can explain important individual differences in cognition. The seminal work of Bernard Weiner (1979) has been instrumental in promoting research that linked cognition and motivation. Ames in the early 1980s also helped connect goal theory with classroom performance (Ames, 1984; Ames & Archer, 1988); others have looked at classroom structures that make a difference in student performance and have refocused on educational motivation as a cognitive enterprise.

Over the past two decades, education and educational issues have dominated both state and national agendas. More federally funded studies of educational issues have been completed in the last 25 years than in any other period of history. It is no surprise that educational psychologists have been involved in or have directed many of these studies that have become a major force in crafting federal policies and legislation. For example, in the 1990s a group of psychologists who were members of the Division of Educational Psychology (Division 15) of the APA were instrumental in producing a collaborative document outlining critical learning principles for all students (*Learner-Centered Psychological Guidelines for School Redesign and Reform*; Lambert & McCombs, 1998). Barbara McCombs, one of the original editors of this publication, reviews in this volume the issues addressed in this document and the impact it has had on recent federal educational policy and reforms.

Distinctiveness of This Volume

Published early in the twenty-first century, this volume looks toward the new century and considers how the discipline of educational psychology will shape the next generation of learners and teachers. Three immediate contextual factors have begun to influence the evolving role of educational psychology in educational practice. First, the gossamer threads of the Internet, a symbol of the information age, will expand increasingly to reach all sectors of our society—in particular, education. Learners and teachers in the information age will more than ever need to be flexible, reflective, motivated learners. Second, in the next decade a significant number of individuals will go through formal teacher education and begin careers. How they use the knowledge, concepts, and methods of educational psychology as they engage in essential acts of teaching (Grant & Murray, 1999) will be critical.

Third, the policy community will have a powerful impact on the funding of research programs sponsored by both the federal government and foundations.

This volume builds upon the optimistic future that Berliner and Calfee (1996) foreshadowed regarding the discipline of educational psychology. Although their handbook provided a systematic overview of the field of educational psychology and legitimized the relevance of this distinct discipline, this volume seeks to highlight key concepts of ongoing research conducted at the turn of the twentieth century. A second goal of this volume is to identify more exclusively the key promising areas for continued research over the next two decades.

This volume both elaborates upon and departs from previous handbook domains. There are distinct overlaps in the following areas of cognition, learning, and motivation, and in reviews of applications of educational psychology to curriculum, classroom, and teaching processes and exceptional learners. We depart, however, in that our intent was to selectively focus on topics that have strongly influenced the field since the mid-1990s. We also choose to de-emphasize traditional school subject domains and instead selected four areas—early childhood, literacy, mathematics learning, and new technologies. These curriculum areas have not only increasingly taken the forefront in the quantity of research conducted, but they also have repeatedly been in the public and policy spotlight influencing many areas of school reform.

Another departure from prior handbooks is that we did not have a separate section or chapters in development or research methodologies because independent volumes in this handbook are devoted to these topics (see Vols. 2 and 6 in this Handbook). Instead, many of the authors here reviewed contemporary developmental findings and elaborated on contemporary research methodologies within their respective domains of study. A final distinct departure is that we have two chapters—rather than an entire section—focused on teaching and classroom processes; this is because this volume is one of a handbook that focuses on the field of psychology. We acknowledge the impact of educational psychology on teaching by including chapters on teaching processes and a more contemporary chapter on teacher learning and teacher education and preparation, which again are issues on whose policy educational psychology research may have a strong influence in the future.

Overview of This Volume

Five major domains of contemporary research in educational psychology are identified in this volume. Within the part entitled “Cognitive Contributions to Learning, Development,

and Instruction,” contributing authors focus on processes and factors affecting the learner and learning, including individual differences and contextual influences in intellectual processes, memory, metacognition, self-regulation, and motivation. The part entitled “Sociocultural, Instruction, and Relational Processes” emphasizes instructional, interpersonal, and relational processes between teachers and students in culturally situated settings for learning. The part entitled “Curriculum Applications” highlights psychological contributions to curriculum and instruction in early childhood, in literacy, in mathematics, and with new media technologies. The part entitled “Exceptional Learner Programs and Students” focuses on understanding the school-based and developmental needs of exceptional learners. Finally, the part entitled “Educational Program, Research, and Policy” presents current practices in teacher preparation and educational research, and it underscores the pressing need to transform the immense knowledge base established by educational psychology researchers into sound educational policy and reform in the future.

The authors of this volume were selected not only because they have made important and long-standing research contributions, but also because their work reflected the most current areas of research defining their respective fields of scientific inquiry within educational psychology. These authors demonstrate domain mastery by their ability to integrate and synthesize research as well as formulate meaningful directions and suggestions for further scientific study. Each of the chapters in this volume provides a unique examination of an important domain within educational psychology. Yet one finds significant communalities across chapters that highlight the connectedness and consistency of educational psychology as a field of study.

COGNITIVE CONTRIBUTIONS TO LEARNING, DEVELOPMENT, AND INSTRUCTION

The focus of this section is on cognitive processes within the learner and teacher, and it includes the development of such processes and developmental directions for future research. Developmental theory is not singled out here, because Volume 6 in this Handbook is dedicated exclusively to this topic. Prominent in this work is a focus on individual differences in intellectual processes, memory, metacognition, self-regulation, and motivation. The chapters in this section also exemplify the field of educational psychology by relating theory to instruction and factors affecting individual learners and teachers within classrooms.

Contemporary Theories of Intelligence

The field of educational psychology has a long history of research and interest in the theory and study of intelligence. In the early part of the twentieth century, the *Journal of Educational Psychology* was the primary scientific journal in this country for research on the study of intelligence. In addition to theories, a major emphasis in this field of inquiry was its measurement, which continues to occupy a significant place in the study of intelligence. Sternberg (this volume) reviews both classical and contemporary intelligence theories and their profound implications on practical life and societies. He critically evaluates classical intelligence theories that have had a strong impact on education and goes on to present challenges to these and to current conceptions of intelligence. Intelligence-related abilities permeate many areas of society. In the United States and many other Westernized nations, these are most visibly represented in a multitude of educational and occupational tests shown to relate to societal success. Competing views about the sorting influence of intelligence are presented. Sternberg concludes that societies often choose a similar array of criteria to sort people, but he cautions that such correlations may simply be an artifact of societally preferred groups rather than a result of some natural processes.

Sternberg describes the need for psychometrically sound measures of intelligence as a necessary prerequisite for the validation of theories of intelligence. A significant trend in the last two decades of the twentieth century has been the development of intelligence tests based on cognitive and information processing theories of intelligence. Literature is presented on implicit views of intelligence that have served as the basis for explicit conceptions and tests of intelligence. The early biological theories of Halstead (1951), Hebb (1949), and Luria (1980) are reviewed and contrasted with more contemporary biological findings and theories that are poised to have a substantial influence on psychometric work in the future.

Memory and Information Processes

In the 1950s, information processing theorists provided an alternative to behaviorism and offered a rebirth for cognitive psychology. Mayer (this volume) reviews the dominant influence of information processing theories of cognition over the past several decades. A major premise underlying information processing theory is that the human mind seeks to build and manipulate mental representations and that these cognitive processes can be accessed and studied through physiological responses—and more recently, by using introspective interviews and other learning-based observations. Work is

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reviewed that supports two contrasting views developed within an information-processing paradigm. Classical theorists use the computer-as-mind metaphor with ideas that the human mind is like a complex machine that can be captured through increasingly complex algorithms. Alternatively, constructivist theorists view the human mind as a place where learners actively build their own knowledge structures by integrating new information with the old (see chapter by Mayer in this volume). Each of these approaches has contributed to somewhat independent streams of research for analyzing fundamental cognitive processes, characterizing key types of mental representations, and proposing integrative systems of learning. Nevertheless, work within each of these paradigms reveals that meaningful learning is a generative process in which the learner must actively engage in cognitive processing rather than passively receive or store information (Wittrock, 1990). The components and underlying assumptions of a comprehensive representative model of information processing are presented. Finally, information-processing contributions are reviewed across three content areas—reading, writing, and mathematics learning—and future implications of this work are outlined.

Self-Regulation and Learning

Schunk and Zimmerman (this volume) discuss the role of self-generated or self-directed activities that students use during learning. These notions strongly suggest that students are actively constructing and exercising control over their learning and social goals. Five theoretical perspectives are reviewed that have characterized work within this area: operant theory, information processing theory, developmental theory, social constructivist theory, and social cognitive theory. Research to support the role of self-regulatory processes is reviewed, as is a well-documented intervention that has been successfully linked to improvements in self-regulation in a variety of learners and across different learning contexts. It is of interest to note that the vast majority of the research presented in this chapter focuses on the examination of psychological constructs within the context of the school classroom. The importance of self-regulation in the learning enterprise is presented and reinforces the critical application of educational psychology toward understanding how children learn and how we can enhance the learning process.

Metacognition and Learning

McCormick (this volume) reviews work focused exclusively on metacognition and learning. First, various historical

definitions of metacognition are reviewed and contrasted with the more precise definitions currently in use. Clear distinctions are made between metacognition and self-regulation. Metacognition is viewed as one aspect of the larger concept of self-regulation. The latter field of inquiry and its relation to learning is examined by Schunk and Zimmerman elsewhere in this volume. Theoretical issues that have driven researchers over the years are presented, as well as the current unresolved debates. Research paradigms used to assess such abilities are reviewed, including feeling of knowing, pretest judgments, and judgments after retesting. An argument is made that work in metacognition is best viewed as a bridge between theory and practice. Much of the empirical work in this area has been conducted with authentic academic tasks such as reading, writing, and problem solving in science and math.

Motivation and Learning

Pintrich (this volume) presents a comprehensive review of the substantial advances in our scientific knowledge of motivational constructs and their impact on student cognition and learning, especially in classroom settings. Rather than review separate motivational theories, four general outcomes and three key theoretical constructs that cut across theories are highlighted to build a more integrative synthesis of current work in the field. The four motivational outcomes include (a) why individuals choose one activity over another (e.g., to do school work or to play with friends); (b) why individuals become more or less involved in a task either overtly (e.g., taking more detailed notes) or covertly (e.g., using more self-regulation strategies); (c) why individuals persist on a task or are willing to try hard; and (d) what motivational constructs contribute to learning and achievement. The three key constructs are organized into expectancy, value, and affective components of motivation. *Expectancy components*, defined as beliefs about one's ability to control, perform, or accomplish a task, are substantial predictors of learning and achievement outcomes. Three subtypes have been studied: capacity-personal, strategy/means-ends, and outcome-control expectancies. Most research evidence points to the importance of outcome-control expectancies—in particular, self-efficacy—and their link to later learning and achievement. *Value components* are defined as goal orientations or cognitive representations of the purpose of a task as well as task value beliefs about the importance of a task, one's interest in a task, and one's ideas about the ultimate utility of a task. *Affective components* are defined as general feelings of self and one's emotional reactions to a task that affect cognitive resources and performance.

INSTRUCTIONAL, INTERPERSONAL, AND RELATIONAL PROCESSES

Contemporary educational psychology draws substantial inspiration and guidance—directly and indirectly—from social learning theory and in particular from the work of Bandura (1969, 1977, 1982). This work reflects a strong sociocultural perspective in which the emphasis is on interpersonal, motivational, and social processes that occur in classrooms and other culturally situated settings. Work reviewed here focuses on group structures, cooperative learning, and interpersonal relationships, and on the role of personal motivation, goals, and other internalized social processes that contribute to academic, behavioral, and social adaptation. The impact of gender is explored, as is the question of how instruction is affected by important sociocultural contexts.

Sociocultural Contexts for Teaching and Learning

Social and cultural contexts are important considerations for the understanding of learning and development. The influence of Vygotsky in the latter part of the twentieth century has provided a scaffold for the development of theories of language acquisition, writing, assessment, concept formation, and other domains of learning. Vygotsky's work and that of other Russian psychologists such as Luria in the early part of the twentieth century created a major paradigm shift in Western psychology in the 1960s and 1970s (Luria, 1961; Vygotsky, 1962, 1978). This body of work—in particular, the concepts of internal dialogue and the verbal mediation of behavior—greatly influenced the field of learning and also the emerging field of cognitive behavior modification, as evidenced in the work of Donald Meichenbaum in the development of self-instructional training (1977).

John-Steiner, one of the original editors of Vygotsky's (1978) major work *Mind in Society: The Development of Higher Psychological Processes*, and her colleague Mahn (this volume) describe the social and cultural contexts for instruction and learning. They discuss sociocultural approaches in educational psychology with an emphasis on the contributions of Vygotsky and his notions of the individual in the creation of contexts and the internalization of person and environment interactions. The broad interdisciplinary applications of Vygotsky's work and theories are presented in this chapter as John-Steiner and Mahn clarify the philosophical underpinnings of this framework and how it addresses a range of learning outcomes. The breadth of Vygotsky's ideas and their implications for understanding the context and processes of learning are presented, along with the nature of

his dialectic method as applied to cognitive processes. The role of Vygotsky's work and theories for educational reform, including children with special needs, assessment—in particular, dynamic assessment—and collaborative efforts in education are also highlighted.

Teaching Processes in Elementary and Secondary Education

There is little doubt that teachers in most cases play the ultimate role in the education of children, a responsibility of enormous importance. For the education of young people, teachers are expected to be experts in classroom management, curriculum, and instruction; in creating classroom environments that are physically and psychologically motivating; and in transmitting knowledge. Pressley and his colleagues (this volume) review and synthesize the research on what makes effective teachers. Investigations of teaching processes provide us with information on what makes effective teachers.

Pressley et al. examine the research and evidence on teachers' direct transmission of information to students—what we traditionally view as teacher-directed, didactic instruction—along with teacher questioning, explanations, and interactions and feedback to students. An alternative to this approach is constructivist teaching processes, including procedures that focus on discovery learning (pure and guided), problem solving, and related activities that challenge and actively engage students in the learning enterprise. There has been great debate in American education regarding the efficacy of direct transmission versus constructivist teaching processes, and Pressley et al. note how these two approaches can be melded to provide a scaffold of instruction and student learning.

Critical to teaching and learning outcomes is the motivation of learners. The manner in which teachers motivate students to engage in learning-related activities is an important variable in determining teacher effectiveness. Pressley et al. note such factors as rewarding achievement, encouraging moderate risk taking, focusing on self-improvement rather than performance comparisons with others, encouraging cooperative group learning, increasing curiosity and cognitive challenge, creating interesting learning tasks and materials, increasing attributions to effort rather than ability, reinforcing the modifiability of intelligence or cognitive ability, bolstering students' self-efficacy for academics, and enhancing students' healthy sense of self. Research shows that effective teachers are active in their promotion of student and classroom motivation (Brophy, 1986).

To better understand the teaching process, Pressley et al. describe how research in the latter part of the twentieth

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century has provided information on teachers' thinking as they teach, on their knowledge, and on their beliefs about teaching. This research base allows for the examination of factors related to expert teaching. As pointed out by Pressley and colleagues, teachers' behaviors in creating physical and psychological classroom environments that assist in motivating students and provide for good classroom management are characteristics of highly effective teachers. Pressley et al.'s review serves to provide hypotheses as to the meaningful differences between typical and excellent teachers and at the same time acknowledges the immense challenges faced by teachers, particularly as they begin the teaching profession.

Cooperative Learning

After reviewing literature conducted over the past 30 years, Slavin, Hurley, and Chamberlain (this volume) present an integrative model of the relationships among variables involved in cooperative learning. These researchers move beyond a review that establishes the effectiveness of cooperative learning to focus more specifically on conditions under which it is optimally effective. Slavin et al. review recent empirical work on cooperative learning directed at identifying critical factors that motivate and impede learning outcomes. The work in this area primarily has been framed within four theoretical perspectives: motivational, social cohesion, cognitive, and developmental perspectives. Critical group processes, teaching practices, or classroom structures are evaluated within each of these frameworks. Although several comparative studies have been conducted to contrast alternative theoretical formats of cooperative learning or to isolate essential elements, this work has been hindered due to the variety of factors examined and the different measures, durations, and subjects that have been used.

Much of the research conducted over the last decade has focused on how to structure interactions and incentives among students in cooperative groups. One consistent finding is that cooperative learning is most effective when groups are recognized or rewarded for individual as well as group learning goals (Slavin, 1995). Although the specific forms and means of implementing group incentives and individual accountability have varied widely across studies, evidence overwhelmingly points to the need to include both to obtain the greatest long-standing impact on students' learning. Slavin et al. also point out work that demonstrates the times when group goals and individual accountability may not be necessary. For example, when students are working collaboratively on higher level cognitive tasks that lack a single right answer, when students are already strongly motivated to perform (as in voluntarily formed study groups), or when the

tasks are so structured that learning is likely to result simply from participating. Another context in which group goals and individual accountability may not be essential is during communal learning groups composed of homogeneous ethnic minority members, possibly because of an already high level of interdependence functioning within African American communities (Hurley, 1997).

Relationships Between Teachers and Children

Pianta, Hamre, and Stuhlman (this volume) assert that classroom research on teacher processes and teacher-student relationships has moved far beyond its original focus on teachers' and students' expectations and instructional interactions, classroom discipline and management, socially mediated learning, school belonging and caring, and teacher support. They point out that many of these topics have roots in many sources and disciplines, a sampling of which include the original work of Brophy and Good (1974) on teacher-child interactions, Rosenthal (1969) on classroom interpersonal perceptions and expectations that influence student performance, Vygotsky (1978) on socially constructed development, Bronfenbrenner and Morris (1998) on the influence of multiple contexts on development, Bowlby (1969) and Ainsworth, Blehar, Waters, and Wall (1978) on attachment processes between parents and children, the clinical work investigating marital and familial processes (Bakeman & Gottman, 1986), the role of adult relationships in promoting resiliency (Pederson, Faucher, & Eaton, 1978; Werner & Smith, 1980), and finally the longitudinal contributions of developmental systems theory and longitudinal studies of health and psychopathology (Loeber, 1990; Rutter, 1987).

As conceptualized by Pianta and colleagues (this volume), child-teacher relationships not only involve the study of verbal and nonverbal communication processes for exchanging information between two individuals, but also embody biologically determined characteristics and attributes of the individuals involved (i.e., age, gender, ethnicity, temperament, developmental history, and experience), individuals' views of the relationship and their own and the other's role in the relationship, and the external systems within which these interactions are embedded. Educational psychologists have been instrumental in demonstrating that such relationships are a central school-based relational resource that has a positive and reciprocal effect on students' learning, achievement, enjoyment, involvement, and school retention as well as on teachers' sense of well-being, efficacy, job satisfaction, and retention in teaching (Pianta, 1999). Pianta et al.'s chapter reviews current work on teacher-student relationships that has evolved into a dynamic field of study based on developmental

systems theory (Lerner, 1998) in which relationships are viewed as part of holistic, multilevel interrelated units functioning reciprocally to motivate successful adaptation and developmental change.

School Adjustment

Wentzel (this volume) has reviewed work demonstrating the importance of social competencies to overall school adjustment and the interrelationships of social, motivational, and academic success. An ecological approach is adopted as a framework to understand how students formulate goals that result in social integration (group cohesion, functioning, responsiveness) and personal social competence (self-determination, persistence, inquisitiveness, and other prosocial skills). She reviews research on school adjustment—defined by motivation of social goal pursuit, behavioral competence, and interpersonal relationships—and focuses on how these assets form a profile of interrelated competencies that are directly related to academic achievement. Research has demonstrated that socially adjusted individuals are able to set and achieve personally valued goals that are sanctioned by the larger community as relevant and desirable. Educational psychology researchers have been at the forefront of work identifying what motivates and mediates such personal goals, the impact of these on personal and school adjustment, and the classroom-school factors that support and promote the expression of these attributes (this volume). Critical factors related to social and school adjustment have been identified. In one study, teachers described ideal students as having socially integrative (helpfulness, sharing), learning (persistence, intrinsic motivation, interest), and performance characteristics (completing assignments, organization).

Gender Issues in the Classroom

Koch (this volume) reviews important literature on gendered socialization of students as they participate in the social and academic culture of the classroom. She suggests that work on social relations in classrooms has led to contemporary efforts to examine curricula through the eyes of gender. She reviews classroom research, practices, and policies that differentiate gender experiences in ways that limit opportunity for females and males in the classroom.

Researchers have shown that the socialization of boys and girls promotes gender stereotypes that in many cases are supported by classroom practices. The work of educational psychologists and others has begun to address the content of the formal curriculum, classroom interaction, and classroom climates that promote gender equity. She explores the

attributes of gender-equitable classrooms that foster equitable learning environments for males and females; she also points to the need for a heightened awareness of the impact of gender issues on student learning and self-concept. *Gender equity* in education refers to educational practices that are fair and just toward both females and males. This work has led to improvements in classroom learning environments and has led to ideas about how to change teachers' attitudes through increased awareness of hidden curriculum and gender-differentiated instruction. Researchers have begun to bypass the oversimplification that sometimes has characterized the field of gender equity. Research on equitable environments seeks to uncover the differential needs and social issues behind gendered behavior. Rather than simply advocating equal treatment, equitable interventions are designed to encourage all children to see themselves as contributors to the class environments. The result may in fact lead to the offering of different experiences to girls and boys in the effort to level the playing field for all students.

CURRICULUM APPLICATIONS

Educational psychology has always concentrated on the improvement of educational programs and instruction through the application of psychological theories, processes, and research. In this manner, teaching and curriculum materials and technologies are informed by educational psychologists. Work reported in this section centers on the psychological contributions to curriculum and instruction in early childhood, literacy, mathematics, and computers; it also addresses new media and technologies for learning. Rather than cover all of the traditional school subject curriculum domains, we selected four broad areas in which educational psychologists have had a major and continuing influence over the past two decades. These selected areas have received increasing attention by politicians due to societal pressures and have taken the forefront both in the quantity of research conducted and in their influence on key areas of school reform.

Early Childhood Education

According to Goelman and his coauthors (this volume), research in early childhood education has grown dramatically over the last two decades in concert with our increased knowledge about the significance of the birth-to-five period; the fact that there has not been a chapter on early childhood education in any prior handbook of psychology was duly noted. The authors provide a brief but important overview of how historical issues in early childhood education have

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set the stage for contemporary research. Research in early childhood education has contributed to a new understanding of preschool learning and development and the settings in which young children participate. Important discoveries are reviewed about the role of play in all aspects of development, likely progressions in play, and the relationship of play behavior to a multitude of interrelated skills such as communication, artistic and musical ability, and early literacy and mathematical skills. Contemporary use of art, play, and music in early childhood education is reviewed, including how teachers might use play to create an environment to nurture and enhance children's mental and moral development (originally proposed by Dewey in 1916). In the first section, the authors review important research contributions in learning and teaching across the domains of play, art, music and literacy. In the second section, issues of diversity and cultural pluralism and their impact on the field of early education are explored through a review of literature associated with giftedness, language learning, attachment, and temperament. The final section is devoted to an integrative model that reflects current thinking about best practices in compensatory education and early child care programs.

Psychology of Literacy and Literacy Instruction

Perhaps no other single educational issue has received as much national and international attention as literacy development. Pressley (this volume) reviews this enormous multidimensional domain of literature by focusing on issues most directly influenced and studied by psychologists and educational psychologists. He directs readers who want a broadly informed opinion and more historical background to several comprehensive volumes on reading research. Pressley emphasizes replicable findings that have been complemented by descriptive methods of classroom practices and reviews key findings beginning in late infancy through early adulthood. With regard to early literacy, it is now widely acknowledged that a great deal of learning occurs before children enter school. Key issues associated with the preschool years include the study of early adult-child interactions that promote emergent literacy and the study of phonemic awareness (i.e., the awareness that words are composed of sounds blended together). Research has convincingly pointed to early verbal interactions, shared reading events, and phonemic awareness as important prerequisites to learning to read and write. Psychologists also have been at the forefront of addressing early word recognition processes and researching the benefits of different methods for teaching beginning readers how to sound out and spell words.

Descriptive classroom studies by Pressley and others have lead to enormous insights about how exceptional primary teachers motivate, instruct, and support continued progress in literacy. Significant progress has been made in understanding basic reading comprehension processes with concomitant research on specific approaches to stimulate fluency, improve vocabulary, and foster the use of critical comprehension strategies before, during, and after reading. Research parallels to writing development and instruction also are reviewed. Finally, work on adult literacy difficulties in word analysis, comprehension, and writing are presented as well as current findings on effective adult literacy instruction. Debates exist as to whether and how our increased knowledge about literacy should be translated to instructional contexts and into educational policy. Notwithstanding these debates and concerns, contemporary findings regarding early, beginning, and advanced literacy skills have fundamentally altered the way that reading and writing instruction is conceived.

Mathematics Learning

We often take precursors to the development of mathematics and mathematics learning for granted. The psychology of mathematics learning is a broad field of study. To provide a meaningful discourse on some of the major developments and research in this field, Lehrer and Lesh (this volume) systematically examine the development argument and inscription as these domains relate to mathematics learning. From these basic structures, the authors examine how generalizations evolve in the areas of geometry-measurement and mathematical modeling—the former drawing from the related domain of spatial visualization and the latter from an area of needed research in mathematics learning and education. To support their treatise, Lehrer and Lesh utilize cognitive and sociocultural perspectives to examine research and theory in these fields of scientific inquiry.

Lehrer and Lesh formulate and present rationale that describes the development of conversational argument, including such concepts as analogy and the development of relations, conditions, and reasoning and how these provide routes to the formulation of mathematical argument as well as mathematical proof. The role of inscription systems or marks on paper and other media is described as a mediator to mathematics learning. From a developmental perspective, the growth of inscription ability and skills allows for the differentiation of numbers from letters, forms, maps, diagrams, and other aspects of symbolic representation.

Geometry as a spatial mathematics is anchored in the development of spatial reasoning. Lehrer and Lesh argue for the inclusion of measurement in geometry education and provide

evidence for their relationship. This is examined by investigations of children's reasoning as it relates to the measurement of space, including classic developmental studies of Piaget, Inhelder, and Szeminska (1960) to recent cognitive science investigations.

Lehrer and Lesh call for a broadened scope in what we consider to be mathematics, taking a cognitive developmental perspective with particular relevance to classroom-based research and its application to mathematics education. The case is presented for mathematics learning as a complex realm of inquiry that draws from many cognitive domains. They review significant recent work emphasizing classroom practices that can support productive mathematical thinking even in early elementary classrooms, such as pretend play, setting norms for classroom conversations that emphasize the need for proof, and the orchestration of guided dialogic experiences generated from collective and shared everyday knowledge.

Computers, the Internet, and New Media Technologies for Learning

Goldman-Segall and Maxwell (this volume) present a historical review and creative prospective insights into how technological advances have been shaped and have helped shape our current notions of learners, learning, and teaching. These researchers review the dynamic field of new and emerging medias and technologies that have the potential of creating unique—possibly until now unfathomable—themes of research in educational psychology. They trace instructional technology from its behavioristic, computer-administered drill and practice roots, to the influence of the cognitive science revolution, with its focus on artificial intelligence and analogies to information-processing computing paradigms, to more contemporary situated models of contextualized learning, in which cognition is not viewed in a straightforward algorithm, but rather as the emergent property of complex systems working in parallel. They review different analogies used to characterize the influence of computers in education. These perspectives independently have viewed the computer as an information source, as a curriculum domain, as a communication medium, as a cognitive tool, as an alternative learning environment, as learning partner, as means of scaffolding learning, and most recently as a perspectivity tool. They go on to point out significant newly emerging paradigms and the concomitant challenges that will ensue from these dynamic new applications. The idea of perspectivity technologies and their points of viewing theoretical ideas will be developed over the coming decade with expansions to notions the computers allow for elastic knowledge construction.

EXCEPTIONAL LEARNER PROGRAMS AND STUDENTS

Exceptional students have long been a major focus of research in educational psychology and a major recipient of the applications of research to practice in educational psychology. From the very early applications of Binet and colleagues in France (Binet, 1898; Binet & Henri, 1896; Binet & Simon, 1905) and efforts in the United States (Terman & Childs, 1912; Woolley, 1915) in the development of intelligence tests for the identification of students with exceptional needs who would benefit from special education, educational psychology has informed and addressed the needs of exceptional learners.

Work here focuses on the contributions of educational psychology on understanding the school-based and developmental needs of exceptional learners. Within this domain we include the field of school psychology, which includes a major emphasis on the evaluation and development of programs and interventions for exceptional learners. Educational psychology has had an impact on the study of individuals with learning disabilities as well as those of high cognitive ability. Investigations in these areas have ranged from basic processes to applied research on intervention programs. Students who demonstrate behavioral excess represent another important target population for the application of research on classroom management and behavior change supported by educational psychology.

School Psychology

School psychology is a field of psychology that is closely aligned with educational psychology. School psychology is an applied field of psychology, represented in APA by Division 16 (School Psychology) and by other professional organizations, the most visible being the National Association of School Psychologists (NASP). School psychology is dedicated to providing for and ensuring that the educational, behavioral, and mental health needs of children are met in accordance with federal and state legislation. The vast majority of school psychology graduate programs are located in departments of educational psychology or schools of education, with most of the remainder found in psychology departments. Reschly (this volume) describes how societal events and trends have had a hand in the shaping of school psychology practice and focus over the past century, including events of the last decade of the twentieth century.

School psychology has been an area of psychology that has experienced a tremendous increase in the number of professionals in the field. As presented by Reschly, over the past

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25 years, the number of school psychologists as estimated by the U.S. Office of Education has witnessed an increase of over 150%, and data suggest that there is a continued need for school psychologists in the United States. Much of the emphasis in the training and practice of school psychology has been directed by the needs of exceptional children in school settings and the guidelines for the provision of services provided by the Individuals with Disabilities Education Act (IDEA) and other federal legislation. There are over 5 million children and adolescents with educational and emotional disabilities in the nation's schools, representing approximately one out of nine children. The approximately 26,000 school psychologists in the United States have a major role in the direct evaluation and provision of psychological services to these children, illustrating the importance of this branch of psychology to the welfare of young people.

Reschly provides a description and discussion of the legal requirements that shape the practice of school psychology, as well as the current characteristics and conditions that illustrate the practice of school psychologists in the United States. The infrastructure of school psychology, including a description of relevant journals in this field, is also provided. Finally, contemporary and future challenges to school psychology are presented, focusing on issues of disability determination and special education placement, the need for empirically supported interventions (see also chapter by Levin, O'Donnell, & Kratochwill in this volume), personnel needs, and the recognition of mental health needs of school children. Reschly's chapter serves to illustrate the importance of school psychology in the education of children and an important application of psychology to education.

Learning Disabilities

Learning disabilities represent one of the most prevalent forms of learner problems; it is also a field of study that is replete with controversy as to classification, assessment, and intervention. It is also a domain that crosses over a wide range of professionals and research perspectives—educators, psychologists, neurologists, pediatricians, neuropsychologists, and others. Siegel (this volume) describes the issues and controversies related to the definition of learning disabilities, including that of using intelligence for defining criteria for diagnosis. She makes the point that the use of intelligence tests is limited in this application, given problems with the anchoring of these tests in knowledge-based domains, as well as the given that youngsters with learning disabilities will by definition often have deficits in skills that are required of the intelligence test. Siegel describes the issues related to the question of whether learning disability is a specific, possibly

neurological type of dysfunction, as well as whether there are multiple subtypes of learning disabilities specific to academic problem domains.

Siegel addresses some of these controversies by critically examining the research and providing insights into the current status of learning disability subtypes. She then provides a critical examination of the research on reading and arithmetic disabilities and a description of assessment requirements. A number of recommendations and accommodations for the remediation of learning problems are given.

Gifted Education Programs and Procedures

Olszewski-Kubilius (this volume) reviews work focused on defining characteristics of gifted children as well as research that demonstrates important implications for education. In addition to more knowledge of the striking capabilities of gifted children, there is increasing evidence of considerable inter- and intra-individual variance or asynchronous development (Morelock & Feldman, 1993). Gifted students are a heterogeneous group whose members differ from each other in their developmental pathways and in their distinct profiles of abilities. At the same time, researchers have consistently confirmed the stability of exceptional abilities over time. Difficulties associated with assessing younger children and the limitations of traditional and standardized intelligence measures are discussed. Such issues have led researchers to conclude that early identification of giftedness may be compromised with typical cognitive assessments because development in some areas may be more closely related to ceilings set by chronological versus conceptual maturity. Programs and practices are reviewed that are currently employed across the country to address the needs of these students.

School-Related Behavior Disorders

The field of behavior disorders in children and adolescents has emerged as a major focus of psychologists, teachers, administrators, state and federal governments, and the general public. With the publication and dissemination of the Surgeon General's report derived from a year-2000 national conference on children's mental health and the needs of this population, there was an increased national awareness of the psychological needs of children and adolescents with behavior problems. As Walker and Gresham (this volume) describe, the widely publicized cases of school shootings and violence by students has galvanized the general public and professionals toward actions aimed at creating safe school environments and an increased acknowledgment of students with extreme emotional and behavioral disturbances.

Walker and Gresham provide a critical examination of behavior disorders in children and adolescents by first delineating the current status of the field. This is followed by a discussion of current trends in research and practice in this field that the authors consider to be indicative of best practices, including functional assessment of behavior, interventions that utilize positive behavioral support, research examining teacher interactions with students with behavior disorders, the association between language deficits and behavior disorders in children, the utility of office referrals as a critical indicator of potential behavior disorders, and resistance to intervention as a cardinal symptom for the determination of treatment eligibility and selection. Walker and Gresham also describe a number of problems in the field of behavior disorders, most of which are at a policy or practice level. These include political turmoil in the field of behavior disorders as a specialty area; limited translation of quality research on major problems in the field to everyday practice; the larger role of creating safe and healthy school environments; the propensity for postmodern and deconstructivist perspectives that devalue scientific research to be adopted by behavior disorder professionals; the general failure of schools to serve the needs of students with behavior disabilities, in part due to interpretation of federal education legislation; and finally, the relative lack of attention by professionals and leaders in the field to early identification and prevention activities.

Instrumental to the provision of appropriate services is the utilization of well-researched interventions for the treatment of behavior disorders in children and adolescents in school settings. The authors provide an argument for the use of social skills instruction with appropriate inclusion of procedures to modify maladaptive behaviors.

EDUCATIONAL PROGRAMS, RESEARCH, AND POLICY

Educational psychology has had a significant role in the development and reform of educational practices. An important contribution of educational psychology is the knowledge and guidance provided to the education of teachers. As noted earlier, courses in educational psychology are required in most university teacher preparation programs. An examination of introductory textbooks in educational psychology shows a strong preference toward teachers as their primary audience. Hoy (2000) observes that it is through textbooks in educational psychology that we can see what the general public and teachers learn about the application of psychology to teaching and related educational activities. The significant breadth of methodological knowledge that educational

psychologists bring to the political reform table has been influential in stressing the need for credible school-based intervention research. In this respect, educational psychology acts as the conduit to introduce and apply research and principles of psychology to educational practices. The role of educational psychologists will continue to be an important and credible voice in resolving ongoing controversies critical to the advancement and application of knowledge for educational practice.

Teacher Learning, Education, and Curriculum

Learning to teach is arguably one of the most cognitively and emotionally challenging efforts one can undertake, and new teachers face greater challenges than ever before with today's diverse student needs, public scrutiny, and political pressures (see chapter by Whitcomb in this volume). Concurrently, there is a critical need to prepare more teachers than ever before and there are deeply divided ideas about best practice for initial teacher preparation (National Commission on Teaching and America's Future, 1996). Whitcomb asserts that there is a critical need for rigorous empirical work on initial teacher preparation. Until recently, scholarly analyses of this pedagogy have been surprisingly limited.

What do initial teachers need to know? Whitcomb reviews and synthesizes that large body of work dedicated to establishing teaching as a learning profession (Darling-Hammond & Sykes, 1999). Teaching is now viewed as a profession with a complex and distinguished knowledge base. Current research is focused on the integrated processes and judgments teachers use to navigate this breadth of information. Whitcomb narrows the focus of this chapter to a critical review of cognitively oriented studies of new teacher's learning. There is an emphasis on what is known about the essential knowledge base for new teachers and how teachers learn across diverse contexts.

The chapter begins with an overview of prior research conducted to identify a knowledge base associated with what an effective beginning teacher needs to know, to do, and to value (Ball & Cohen, 1999). Theoretical shifts in studies of teaching have followed much the same route as that observed in the broader field of educational psychology. Views of a good teacher have moved from a focus on discrete knowledge and skills, to studies of the cognitions and decisions that occur during teaching, to more recent studies on the interplay of personal beliefs, knowledge, skills, and situational or contextual mediators of initial teachers' learning.

From the early 1980s educational researchers have focused on building an understanding of the specialized knowledge base required to effectively teach content in

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multiple ways to diverse learners. This work has been strongly influenced by the work of educational psychologists working within social constructivist models that view physical and social contexts as integral parts of any cognitive endeavor. Research within this tradition stresses that the situations and the social environments within which they are learned influence skills and that such situated knowledge becomes a fundamental part of what is learned.

Currently there is a move away from studying individual teachers' knowledge to studies that focus on interactive systems as the unit of analysis (Putnam & Borko, 2000). Recent work has focused on the dispositions that underlie good teaching—how teachers become committed to students, to meeting individual student needs, and to monitoring their own and their students' learning. In this respect, teaching and teachers are viewed as part of learning communities that require judgment and ongoing, flexible decision making to support student learning in culturally inclusive settings. Researchers are now examining how teachers learn to teach—how they actively construct a personal knowledge base and then use it to guide everyday classroom judgments and learning. These contemporary efforts are critically relevant to initial teacher preparation.

Whitcomb goes on to highlight key features of effective initial teacher preparation programs. This work supports the critical role of prior beliefs, content knowledge, mentors, colleagues, and the setting in which teacher candidates learn to teach. Two promising lines of research are summarized that embody some of these essential characteristics—research on how initial teachers learn to teach writing and research on the impact of case methodology in teacher preparation.

The chapter ends with a critical analysis of the limits of current research and the need for stronger empirical work to enhance our understanding of initial teacher pedagogy in the future. The conclusion drawn from this review is that educational psychologists are in a unique position to influence and conduct rigorous inquiry that will further unravel the complexity of teaching and contribute to the development of effective initial teacher preparation models.

A Case for Enhancing the Credibility of Educational-Psychological Intervention Research

Educational psychology has for over a century been at the forefront in the development of research methodologies and statistics. Educational psychologists have been active in the fields of educational measurement, statistics, and research designs. Notable journals include the *Journal of Educational Measurement*, *Educational and Psychological*

Measurement, *Journal of Educational Statistics*, *Applied Psychological Measurement*, *Educational Assessment*, and others that have as a primary focus the presentation of new measurement, statistical, and research methodologies. In the chapter by Levin et al. (this volume), a very provocative argument is forwarded that stresses the need for more credible, rigorous standards in the conceptualization, design, and evaluation of instructional educational research. These authors follow up on the work of Levin and O'Donnell (1999), who—after reviewing the thoughts of many prior editors and presidents representing the field of educational psychology—noted collective concerns about the nature and quality of educational research and the preparation of the next generation of researchers.

Educational psychology more than ever before is expected to improve our ability to understand, predict, and control human behavior as well as our ability to design instructional practices with potential applications to problems of schooling. Recognizing the inherent difficulties in conducting educational research and the importance of bridging many different communities across a wide array of academic disciplines, there is a call for a broader array of naturalistic and empirical methodologies, ranging from case studies and observations to multivariate designs and analyses (Wittrock, 1994). Contemporary methodological debates about qualitative and quantitative or applied and basic inquiry oversimplify and trivialize the issue of how to best obtain quality supportive evidence using a variety of rigorous inquiry standards that could be reflected in any methodological orientation.

The acronym CAREful (Comparison, Again and Again, Relationship and Eliminate) research is used to review components of scientific integrity that can enhance the evidence credibility of educational research. A framework for conceptualizing different stages of such research is forwarded, and promising methodological developments in instructional research are reviewed. Preliminary phases of inquiry place a fundamental value on subjective reflection, intuition, and observation as important steps for guiding further inquiry using objective, scientifically credible methodology in order to make valid prescriptions for future intervention. Trustworthy and credible instructional research to assess the relative impact of educational and psychological treatments or interventions is of critical importance for policy makers. Indeed, as Levin (1994) eloquently argued previously, the future viability of the field will depend on our ability to craft educational intervention research that is both credible and creditable. The development of such innovative methodological continua should become a top priority for future educational researchers.

From Credible Research to Policy and Educational Reform

Educational psychology as a discipline has from its inception sought to inform and help guide the education of students and the development of local and national education policies and reforms. Educational psychology has accomplished this goal by maintaining a strong linkage to credible school-based research and associated methodologies. McCombs (this volume) illustrates how research in educational psychology can be translated to changes in educational practice, with a particular reference to how teachers can be informed by research to modify and enhance their classroom and instructional procedures.

McCombs discusses the learner-centered psychological principles (McCombs & Whisler, 1997), a set of practices that are designed to enable teachers to gain an understanding of cognitive and metacognitive factors in learning, motivational and emotional influences on learning, developmental and social influences on learning, and individual differences in learning and evaluation (APA Work Group of the Board of Educational Affairs, 1997). These principles were designed to provide teachers with a set of practices that focus on the learner, including an understanding of individual differences and diversity of learners and learner styles. The principles originated with the 1990 appointment by the APA of the Task Force on Psychology in Education, which sought to provide for the application of psychological research and theory to learning in educational contexts. McCombs also delineates significant contributions of educational psychology to educational reforms. McCombs notes that educational psychology is an applied science, with knowledge created that drives the practice of teaching and the study of learner characteristics. It also informs policy and educational reform, particularly as we enter the twenty-first century.

Future Perspectives in Educational Psychology

In writing their chapters for this book, contributors were asked to provide insight as to what future trends and directions were anticipated for their respective fields of inquiry. By synthesizing these ideas, Miller and Reynolds (this volume) sought to highlight critical theoretical, research, and practical issues likely to inform and direct the field of educational psychology well into the twenty-first century. Future issues that uniformly surfaced across a majority of chapters were reviewed for their potential of advancing our understanding of individual learners and learning contexts; interpersonal, relational, and instructional processes; curriculum development; and teacher

preparation. Implications are presented for translating theory into educational practice that increases student learning, enhances teacher preparation, and improves schooling practices. Contemporary educational research issues, methodological advances, and the impact of educational research on learning, teaching practice, and educational policies are supported by exemplars posed by authors in this volume.

The chapter concludes with an overview of prospective issues relevant to transforming a vast empirical knowledge base into sound educational policy and practice. Significant contributions of educational psychologists are highlighted, as is the need for trustworthy and credible instructional research to assess the relative impact of educational and psychological treatments or interventions. Future educational psychology researchers must take a leadership role to reduce the tendency to overgeneralize when looking for solutions to very complex challenges in education. There is a strong sense that the field of educational psychology will continue to enhance our understanding of critical educational issues and—most important—will lead to higher standards of quality and credibility to guide future educational policy and reform.

SUMMARY

Educational psychology, broadly described, focuses on the application of psychology to the understanding of learners and the learning environment. However, such a broad generalization of the field does not do justice to the myriad of domains and applications represented by this field of psychology. As this introduction to the field and to this volume of the Handbook illustrates, the field of educational psychology represents an important area of psychological research, theory, and practice.

The five major areas of contemporary research and practice in educational psychology covered in this volume include cognitive contributions to learning; development and instruction; sociocultural, instructional, and relational processes; curriculum applications; exceptional learner programs and students; and educational programs, research, and policy. Within these areas, individual chapters provided for broad coverage of nearly all the domains identified by Pressley and Roehrig as having the most significant impact on the field of educational psychology.

Individually, each chapter describes a rich domain of research; almost universally, they note a burgeoning of new research paradigms, perspectives, theories, and major conceptualizations that have emerged over the last quarter of a century. It is noteworthy that some of these so-called new insights into human behavior and psychology applied to education

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have been predicated on newly recognized and acknowledged contributions made by psychologists (e.g., Vygotsky, etc.) in the early part of the twentieth century. Although the scope of educational psychology as a field of psychology is quite broad, numerous communalities can be seen across the varied chapters of this volume. These communalities suggest a connectedness that supports educational psychology as a rich and vital field of scientific inquiry.

The influence and impact of research in educational psychology on society are probably best recognized by applications to the education and training of teachers and the development of procedures to enhance classroom instruction and learning, ways to motivate learners, and the integration of technology into the classroom. These and other applications in educational psychology are buttressed by an empirical rigor of research methods in the design of both basic and applied experiments and field-based investigations. It is evident that researchers in educational psychology are addressing major issues related to the education of learners in regular and special education contexts. In addition to the impact of educational psychology on learning and learners, it has also played a major role in informing policy and educational reform.

The mosaic of educational psychology is well represented by the authors of this volume and their respective chapter contributions. The sum of knowledge presented in the chapters of this volume illustrates the diversity of research and practice domains. This introduction to current perspectives in educational psychology provides a snapshot of the breadth and scope of this field but does not do justice to the depth of research and applications. For the latter, the following chapters provide excellent description, evaluation, and synthesis. The dynamic nature of this field of psychology is evident across the chapters and serves to illustrate the importance of educational psychology research and practice to individuals and society. It is our expectation that this importance will continue and grow throughout the twenty-first century.

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