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Through Myth to Reality: Reframing Education as Academic Development

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Research Findings: There is ample evidence that true educational progress has been elusive, even after decades of countless school reform efforts. *Practice or Policy:* In this article, barriers to meaningful transformation in the form of common, persistent, and resistant educational myths are presented and summarily debunked. An alternative and more facilitative conception of formal education as academic development is then offered, and the positive ramifications of this orientation for the fostering of learners' cognitive and socioemotional competences are overviewed.

> If we set aside, for the moment, our concerns with the questions of how people learn and look simply at the outcomes of schooling, what do we see? Are students acquiring enough knowledge, or the right kind of "knowledge"? Or, in a more nearly ultimate sense, are they becoming more competent, more able to adjust to and cope with living in our complex society, more capable of practical problem solving, increasingly able to find a satisfying quality to their lives? (Gagné, 1977, p. 411)

If strangers to our world and our times were to document the culture of the schools and classrooms of the United States and other postindustrial societies, they would probably report a near-obsession with tests and test preparation. These observers would likely witness classrooms in which tremendous energy and attention are directed toward annual tests used to judge the performance of teachers and students or to hold schools and their administrations accountable. They might also describe environments in which the actions of teachers and students are becoming increas-

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ingly more regulated and routinized in a manner that mirrors the content and processes of those annual assessments. In effect, they would likely see an educational experience oriented toward test performance rather than toward learning or student development.

For many educational experts, the level of investment that American society now makes in identifying and assessing academic benchmarks or content standards is almost incomprehensible. And it is not solely the fiscal investment that proves staggering. It is also the mounting emotional, educational, and sociopolitical costs that come with this unhealthy obsession with the quantification of school achievement. If we probe deeper into this testing mania, we find that there are good intentions at its core—a well-meaning search for evidence that we are truly "educating" the future citizenry of our country. Yet many within the educational research community, as well as in the public at large, believe that the costs of the accountability movement have far outstripped any academic benefits that might be realized (Abedi, 2004; Feinberg, 1988). Those railing against Public Law 107-110, commonly known as No Child Left Behind (NCLB), and other manifestations of the accountability movement perceive such efforts as significant barriers to the attainment of educational goals—goals that include producing a populace with a hunger for knowledge, the ability to reflect deeply on critical issues, and the skills to deal effectively with the many demands of a complex and rapidly changing world made more accessible as a result of a technological revolution (Alexander et al., in press).

On whichever side of the sociopolitical or educational spectrum one falls with regard to this controversial issue of accountability, there remains the often shared perception that the current state of education is far from optimal. Thus, although many rally around the belief that schooling is not adequately serving the needs of all segments of the school population, there is no agreed-upon course of action. Educational researchers cannot place themselves above this fray, either. We should not be shocked that those in political and public arenas talk almost obsessively about benchmarks or standards or rely on questionable measures to document students' achievements. What reasonable alternatives have we offered? What coherent or comprehensive models have we placed at the feet of the public or the policymakers, who, I must believe, also want the best for our children and youth?

Indeed, my reaction to Robert Gagné's (1977) intriguing questions that opened this discussion is that we still know far too little about the optimal course of learner development across the lifespan and about the anticipated changes that occur in those on that journey. As the contributors to this special issue rightly acknowledge, research has demonstrated that those who face educational difficulties are also apt to suffer physically, socially, and emotionally (e.g., Hughes & Zhang, 2007; Lohr, Teglasi, & French, 2004; Teglasi, Cohn, & Meshbesher, 2004). But the educational concerns addressed herein extend well beyond identified populations strug-

gling within the classroom community. They are pertinent to all members of the classroom community, even those who appear to be negotiating the academic demands of formal education adequately.

This special issue is an occasion to initiate an interdisciplinary dialogue about the interface between cognitive and socioemotional competences within school settings and to consider how current educational goals and pedagogical practices influence the co-development of such competencies. If there is to be some reasonable alternative to the test obsession that now marks the formal educational system, one that values learning over test performance, then it must come from those with the theoretical and methodological knowledge and the commitment to engage in extended interdisciplinary research. It must come from a consortium of individuals like those contributing to this special issue. Therefore, let me throw down the gauntlet to this scholarly assemblage to commit to the systematic, multidisciplinary, and multidimensional study of the formal educational experience and the cognitive and socioemotional changes that this experience should ideally evoke—what I have labeled *academic development* (Alexander, 2000, 2006; Alexander, Schallert, & Reynolds, 2009; Alexander, Sperl, Buehl, Fives, & Chiu, 2004).

I first coined the term *academic development* in my theoretical and empirical writings precisely because no more suitable label for the multifaceted nature of human growth and development could be found (e.g., Alexander, 2000). Although I use the word *academic*, I wish to assuage any fears that I am dealing with schooling in narrow cognitive terms. This is not a "Hirschian" (Hirsch, 1987) perspective on learning and development. Rather, the descriptor *academic* signals the confluence of cognitive, social, emotional, motivational, and cultural factors that contribute to optimal student development within the context of formal education.

Specifically, as a way to explicate and justify this new concept of academic development, my intentions are threefold. First, I want to expose several significant myths that presently plague the educational experience and that act as barriers to the worthwhile goals of this special issue. Those myths include the mistaken belief that achievement, as defined by high-stakes testing, equates to learning, when, in fact, such an excessive focus can be detrimental to lifelong, meaningful learning. The needs of students are better served when more time and attention is devoted to concepts and processes held as central to academic domains, what has been termed *principled knowledge* (Alexander, Murphy, & Woods, 1997; Gelman & Greeno, 1989). There are also the myths that mentioning (i.e., "covering the content") equates to teaching and that the purpose of education is clear.

Second, I hope to convince readers that there is much to be gained when education is viewed as a developmental process rather than a year-by-year, course-by-course treatment of instructional content. This developmental orientation could help to amplify the degree to which a learner's academic development is much more than a coldly cognitive act of accumulating factual tidbits. Rather, it entails

the continual interplay of cognitive and motivational/emotional forces operating within a dynamic sociocultural context.

Third, one of the advantages that comes with viewing formal education as a developmental process is that this orientation could potentially lessen the emphasis on immediate or short-term educational gains and promote contemplation of the more enduring and long-term effects of instructional or curricular decisions. I do not wish to suggest that there are no merits to the examination of more short-term outcomes; there are. However, these more "immediate" gains must be considered in relation to what they suggest about long-term growth and development. For example, do we want to risk stifling students' interest in reading by immersing them in a "drill-and-practice" phonics curriculum devoid of stimulating literature, or risk turning "struggling readers" into "struggling thinkers" by failing to teach them to think critically and intensively about what they read or hear? I would think not. To support this contention, I will share my specific approach to the study of learners' academic development and the theoretical and methodological insights and challenges that this research program has revealed. That theoretical and empirical program centers on the model of domain learning (MDL; Alexander, 1997), which is an attempt to examine the paths of knowledge, strategic processing, and interest as they interact and intertwine across the lifespan as learners journey toward competence or even expertise in academic domains.

Before I delve into educational myths that interfere with the pursuit of academic development, I want to share briefly my personal journey to the realization that the very construct of academic development needed to be introduced into the educational vernacular. Specifically, over the past 25 years, I have been aggressively engaged in the theoretical and empirical study of human learning. That pursuit was a natural outgrowth of my years as a private and public school teacher. As with many in my profession, I chose to become a teacher for altruistic reasons—to help students realize their potential through formal education. Although I considered myself very effective in this honorable profession, I knew that I had much to learn if those altruistic goals were ever to be realized to the level I envisioned.

Thus, I enrolled in a doctoral program in which I found myself enamored with educational research and the potential it held for illuminating the path toward improved learning for all who crossed the threshold into the realm of formal education. Indeed, I learned much about what was required for students like those I had taught to progress not only in their academics but also in their everyday lives. One of the most important lessons that I learned, however, was that complex problems like academic development require multidisciplinary problem solving. Even the most gifted teachers or the most forward-thinking educational psychologists cannot hope to bring students to the pinnacle of their academic potential. The problem is not simply instructional, cognitive, motivational, or sociopolitical. It is all of these. This is the theme of this issue and of this notion of academic development.

EDUCATIONAL MYTHS

How does one explain how or why certain activities, ideas, or beliefs initially take root within the individual mind or the public conscience, becoming commonplace, routine, or pervasive in character, whereas other comparable activities, ideas, or beliefs lie fallow or languish? Ideally, one would hope that a deciding factor between those notions that are ultimately embraced and those that are discredited or discarded would be the credibility or strength of supporting evidence. Sadly, even a cursory examination of wildly popular fads (e.g., text-messaging while driving, bungee jumping) or shared social practices (e.g., overeating on holidays, living on credit) offers sufficient refutation of this ideal state. It is not only the general populace that finds questionable ideas or practices attractive or irresistible. The same tendency can be documented among educational researchers and practitioners who hold passionately to underlying assumptions or favored interventions that are untested or run counter to the prevailing evidence. There is even reason to question what some educators or educational researchers regard as "evidence" in support of favored approaches or emergent interventions, but that issue lies outside the scope of the current discussion.

Perhaps like others within the educational community, I have harbored the somewhat impish urge to stand up in a public forum and shout "The emperor has no clothes!" when I encounter these seemingly unwarranted claims or perceptions. Further, I feel strongly that those within the educational research community have an obligation to call the public's attention to seemingly widespread beliefs or perceptions that, at a minimum, demand closer inspection. It is also essential to turn that critical eye inward to scrutinize certain popular conceptions that appear within the educational discourse. That is my goal in this discussion. I want to expose what I perceive as insidious educational myths that have been allowed to take root and spread within the realms of public perception and political decision making, maybe even reaching into sectors of the educational community. These are beliefs that cannot continue to infiltrate individual minds or public conscience without the protection that comes with healthy skepticism or reasonable doubt.

Specifically, I want to discuss six educational myths that I contend are alive and well within public and political arenas—myths that have not been successfully dispelled and that, therefore, continue to exert tremendous influence on funded educational research and mandated educational practices.

Achievement on High-Stakes Tests Equals Learning

The first myth that I want to expose is the belief that the word *achievement*, which has come to represent performance on high-stakes tests, equates to the concept of learning. I hold no ill feelings toward assessment in general. In fact, I have argued elsewhere that effective education requires effective *assessment* (Alexander, 2006;

Alexander & Riconscente, 2005), which is defined as the "process of obtaining information that is used to make educational decisions about students, to give feedback to the student about his or her progress, strengths, weaknesses, to judge instructional effectiveness and curricular adequacy, and to inform policy" (American Federation of Teachers, National Council of Measurement in Education, & National Educational Association, 1990, p. 1). But tests are merely one aspect of assessment, and tests that result in reliable and valid data are, at best, only meaningful samplings of students' knowledge and capabilities. Consequently, when the educational system relies solely or almost exclusively on high-stakes tests to establish the worth of its teachers, the effectiveness of its schools, or the attainment of its students, the potential merits of assessment are misunderstood.

This tendency to equate performance on high-stakes assessments with learning is problematic for a number of other reasons. It portrays education as a series of discrete hurdles to be cleared rather than as an ongoing journey to be relished. In addition, it is all about the "ends" and not the "means." That is, test performance is the goal—not the understanding or knowledge that such tests are sampling. In essence, this orientation colors academic content as information to be garnered in service of performance, not as knowledge to be sought for personal fulfillment. Further, linking learning to high-stakes tests may promote performance avoidance versus mastery orientation (Harackiewicz, Barron, & Elliot, 1998; Linnenbrink, 2005). That means that students work to avoid failure rather than seek to understand and master valued academic content. Also, this perspective fails to consider students' past history or future performance. It is about what they do at that point on a select measure. How far one has progressed or future academic/personal goals do not enter into the equation. Finally, this orientation toward education is "coldly cognitive" (Pintrich, Marx, & Boyle, 1993). It overlooks critical strategic and motivational factors that are central to academic development.

Of course, it might be argued that the compulsion to let the test drive curriculum may not theoretically be a justifiable decision but that from a practical standpoint it makes sense, since it would seem to ensure that students at least learn the content that is flagged by those tests—the very argument put forth by former President George W. Bush. The problem is that the empirical evidence brings even that argument into question. For example, an experiment by Deci, Spiegel, Ryan, Koestner, and Kauffman (1982) showed that students working with teachers who were instructed to facilitate learning employed more strategies associated with higher academic attainment did better than students whose teachers were told to focus on test standards. Several years later, Flink, Boggiano, and Barrett (1990) replicated and extended those findings. Specifically, in the Flink et al. study, teachers told to ensure that their students perform well on target measures manifested more controlling instructional strategies and had lower student performance than teachers directed to facilitate student learning. Still other data suggest the flaws inherent in the "teach to the test" curricular mentality (e.g., Grolnick & Ryan, 1987; Ryan &

Connell, 1989). It is not only the students who suffer in the current high-stakes test climate. So do the teachers compelled to carry out this national mandate. For example, Emmet Rosenfeld (2004), a former teacher in Virginia, brought the potential side effects of this test obsession to reality as he discussed the negative influence that the state's Standards of Learning had on his career:

> Standards of Learning were introduced to make education better. But in my experience, they had the opposite effect. The intense pressure to raise test scores eventually squeezed the life out of school, both for my kids and for me.… I no longer loved my job; at least, I didn't want to spend the rest of my professional career teaching to a standardized test. (p. 20)

Accountability Is About Improving Students' Learning

Although I am focusing on the current obsession with high-stakes testing, I want to deal with another myth that interferes with students' academic development. Throughout the public and political discourse about educational reform, the notion of "accountability" is often conjured as some elixir to heal current ailments. When accountability is so voiced, it is typically in terms of educational administrators or classroom teachers who must be held responsible for their students' performance on state and national assessments. Implicit in this rhetoric is the assumption that this stress on state, district, or school administrators' or teachers' accountability will contribute to improved student learning.

In effect, this presumption amounts to a "trickle-down" philosophy of educational reform. But does such a belief hold up under scrutiny—or is this just another instance of educational mythology? At the very least, we must acknowledge that this persistent emphasis on accountability stands as a symbol of public and political distrust with the educational system and educational professionals. In effect, since we cannot trust educational professionals to work for improved student learning, we must hold threats over their heads to ensure compliance. Such an "overseer mentality" dismisses the power of positive reinforcers and rewards to encourage individuals to work under challenging conditions or with learners in greatest need. Where are the social, motivational, and financial incentives for those who consider entering one of the most challenging and significant professions? All stick and no carrot! Not much of a motivational plan to recruit outstanding candidates into the teaching profession.

Another dimension of this accountability myth is mirrored in the unit of analysis central to educational legislation, such as NCLB. If accountability were truly about improved student learning over the course of the educational experience, then we would expect the data that come from high-stakes tests to be directly relevant to the identification and service of individual students' academic strengths and needs. Indeed, if there was more diagnostic merit to these high-stakes tests at

the level of the individual learner, and if there was more focus on deeper processing and more complex thinking, then there would be more reason to devote educational time and money to their development and implementation. Yet beyond summative judgments of whether students pass or fail, graduate or not, the unit of analysis on which programmatic, accountability, and instructional decisions are based has little to do with individual student learning and development. Instead the focus is on the collective.

To support this contention, Michelle Riconscente and I examined the language of NCLB to test our hypothesis that the focus was not on learners but on teachers and schools (Alexander & Riconscente, 2005) and that phrases such as "high-achieving schools," "low-performing schools," or "schools that excel" dot the legislative landscape. What we determined in our discourse analysis was that the NCLB legislation used the word "school" almost 4,000 times. The appearances of words such as "individual" or "student" paled by comparison. In fact, "individual" was used 10 times less and "student" showed up at half the frequency of "school" or its variants in this legislation. Regrettably, we must not lose sight of the fundamental fact that schools do not learn. Schools do not struggle to achieve. Schools do not succeed academically. Students who populate those schools and classrooms learn. Students struggle to achieve. And students ultimately deserve the credit for their own academic success. Clearly, there is a confounding of measures of overall school achievement with those of individual students in the educational mythology.

I appreciate that assessment is integral to academic development. However, the choice of assessment must be commensurate with the goals of that assessment since certain indicators have value in particular contexts or for certain tasks or student populations but not others (Mislevy, 1994; Pellegrino, Chudowsky, & Glaser, 2001). High-stakes assessments that measure broad content knowledge are often ineffective tools for diagnosing student learning or guiding instructional decision making (Braun & Mislevy, 2004). When the academic development of students moves to the foreground, the characteristics of those students, along with features of the task and the context, are raised to a higher status, thereby allowing for more valid inferences about learning (Baxter, Elder, & Glaser, 1996; Mislevy, 1994).

Mentioning Equals Teaching

Even in the pre-NCLB days, when I was teaching public school, I remember the pressure to cover the content, that is, the feeling that I had to ensure that my students were at least exposed to all the knowledge and skills specified in the district's scope and sequence chart. I was not alone in this feeling. Covering the content has long been *de rigueur* for practicing teachers required to deal with far too much content in far too short a time span. Moreover, I remain greatly concerned that this drive to get through the material in today's classrooms comes at great cost to aca-

demic development. Like many educators, it had not occurred to me that this mentioning was a poor proxy for the teaching of which I knew I was capable. Mentioning simply does not allow teachers or their students to delve deeply and meaningfully into important academic content.

It is Dolores Durkin (1978–1979) who is credited with coining the term *mentioning*. Durkin, investigating the deplorable lack of comprehension instruction, referred to mentioning as the superficial treatment of essential concepts and strategies. Viewed in this manner, mentioning may promote an "illusion of teaching" among educators, as well as an "illusion of learning" on the part of students (Alexander & Knight, 1993). Thus, educators must recognize that even repeated mentioning of key academic content does not ensure that learning will occur. That is why others have called for teaching more about less (diSessa, 1993). This counterpoint to mentioning (which entails teaching less and less about more and more) may allow educators the time they need to teach. However, it does not address the fundamental question of *what* content ultimately merits such valuable instructional focus. To do that one must ascertain the underlying principles that define disciplines and domains and determine how those foundational principles can be introduced, honed, and elaborated over the course of students' academic development. This ambitious agenda can only be accomplished through extensive interdisciplinary investigation. Such principles are much more foundational understandings than the multitude of concepts and skills that constitute typical school curricula. These principles are, in effect, the premises that define a domain or discipline and distinguish it from yet another domain or discipline. For instance, educational experiences should assist students to understand the nature of historical thinking and facilitate their capacity to gather and analyze relevant historical evidence (Maggioni, VanSledright, & Alexander, 2009). They should also support students' acquisition of the strategies required to pose and test hypotheses about the physical world in science and to interrogate texts while reading in order to achieve a deep comprehension of the encrypted message (Alexander et al., in press; Fox & Alexander, 2009).

Effective Education Will Eliminate Student Differences

Another persistent belief that works against the realization of academic development is the myth that effective education can somehow eliminate learner differences. I first became aware of this myth as a new assistant professor. At a college meeting, a well-intentioned administrator came to the podium to share departmental initiatives. In the excitement of the moment, this individual stated that his department's professional development activities would succeed in leveling the academic playing field for *all* students. The implication of his message was that the better the instruction, the more equality in student learning and achievement would be evidenced. I remember shaking my head in disbelief. Where did such an idea

get started that great education would bring about academic parity at the level of the individual student? Sadly, it is not just this one well-intentioned but misguided professor who gives credence to the myth that effective education will eliminate individual differences.

Before I proceed, let me clarify that I am talking about the mythology surrounding *individual* differences, not *group* differences. There is every reason to view the disparity between particular groups as real and unacceptable (Lee, 2002). However, the rhetoric does not stop at the group but permeates to the level of the individual learner. Consider the following excerpt from NCLB (*Public Law 107-110*, 2001). In the Statement of Purpose, it is claimed that NCLB's purpose of ensuring that "all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at a minimum, proficiency on challenging State academic achievement standards and state academic assessments" (p. 15) can be accomplished by "closing the achievement gap between high- and low-performing children, especially the achievement gaps between minority and nonminority students, and between disadvantaged children and their more advantaged peers" (p. 16).

Thus, even within the federal legislation, there is the notion that effective education can indeed close "the achievement gap between high- and low-performing children," as the wording of NCLB suggests. Despite such well-intentioned phraseology, the reality, I would contend, is to the contrary. That is to say, we can never eliminate individual differences that exist *within* all groups, be they minority or nonminority, economically advantaged or disadvantaged. Moreover, as I argue here, effective education will not only fail to eliminate differences that exist between learners but will also serve to exacerbate such differences. What then is the counterevidence to this myth of eliminating student differences? For one, there has been more than a century of research on the variability that exists at the level of the individual with regard to an array of cognitive, affective, and motivational factors that influence student learning. Students inevitably bring these differences into the academic environment, and their effects on learning and development can be tremendous. Unless human variability can be excised, any expectations of academic "sameness" implied by this myth remain invalid. Let me again make it clear that I am not discussing inequities or disparities that currently exist between cultural and socioeconomic groups. Rather, I am addressing individual or within-group differences.

More to the point, there is reason to assume that effective instruction could potentially exacerbate human differences that exist rather than eliminate them. This assumption is supported by the research on the Matthew effect (Stanovich, 1986). Keith Stanovich named this effect for its literary reference to Matthew 25:29: "For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath." What Stanovich proposed is that students who are cognitively, affectively, or motivationally richer get

richer by building on the resources they already possess. Conversely, those who enter their academic experiences with limited cognitive and motivational resources face the prospect of falling further and further behind their more privileged classmates. Learning environments will, consequently, not be experienced equally by students as a consequence of preexisting differences in their knowledge, strategic abilities, motivations, and cognitive capabilities. The individual differences that preexist any educational experience ensure that variability in learning will result from those experiences.

The Purpose of Formal Education Is Clear

One might assume from the intense concentration of fiscal and human resources on current programmatic and assessment efforts that the most fundamental educational issues—the reason that the social institutions of schools exist and the purpose of the formal education they provide—have been resolved.

However, I would argue that either we have failed to weigh these most basic questions *or* we have failed to consider that content and processes of current educational practices in light of our beliefs. The bottom line is the tacit acceptance that the purpose of education is clear and well established. In truth, one might have untold purposes for participating in formal education. For example, is the purpose of education, as Malcolm Forbes (n.d.) stated, to "replace an empty mind with an open one"? Or is it "the progressive discovery of our own ignorance," as the historian Will Durant (n.d.) so eloquently said? Maybe, like John Dewey (1897), one conceives of education as "a social process … a process of living and not a preparation for future living" (p. 7).

Still, for Martin Luther King (1947, p. 10), the function of education "is to teach one to think intensively and to think critically." Prophetically, King warned that "education which stops with efficiency may prove the greatest menace to society. The most dangerous criminal may be the man gifted with reason, but with no morals." From a more pragmatic and legalistic standpoint, the Supreme Court in *Yoder v. Wisconsin* (1972) ruled that the purpose of education is to prevent citizens from becoming a burden on the state. Yet even from this less lofty vantage point, it would appear that the educational system has failed for far too many of the populace.

However, do we see any of these laudable or pragmatic purposes reflected in current educational policies or assessment practices? Where is the depth of exploration of self or domains of knowledge implied by these declarations (Deci et al., 1982; diSessa, 1993)? Where is the concern for thinking intensively or critically (e.g., Alexander et al., in press)? Where is the investment in moral reasoning (Killen & Smetana, 2006)? I see little in the current educational policies and assessment that portray a clear educational purpose beyond the acquisition of the most basic skills in threshold domains.

The Social and Motivational Aspects of Education Are Well Understood

In their analysis of the research base for the American Psychological Association's learner-centered principles, Alexander and Murphy (1998) stated that the sociocultural context and motivational/affective forces play a significant role in students' learning and development. A wealth of research from social psychology, school psychology, educational psychology, and other fields has established that many noncognitive factors that operate in schools and in out-of-school environments can serve to foster or frustrate students' academic development (Pintrich et al., 1993). For instance, students who have low self-esteem or low efficacy beliefs; students without social supports in school or at home; or students who are bored, disaffected, or generally unengaged cannot be expected to realize their academic potential (Csikszentmihalyi, 1991). Nonetheless, when we consider the focus of teacher preparation, policy initiatives, or curricular interventions, it would appear that the educational experience is largely conceptualized and operationalized as a "coldly cognitive" enterprise (Pintrich et al., 1995).

If academic development is to be fully embraced, it will be critical to address multiple dimensions of students' lives—from their physical care to their social well-being—even as we strive to expand their minds and enrich their knowledge and cognitive capabilities. There should also be systematic consideration of how the educational experience influences motivational and affective conditions, along with the cognitive outcomes that are commonplace. For example, there are reasons to be concerned about the long-term effects of non-engaging reading programs on students' motivations toward reading (Guthrie & Wigfield, 1997) and about a growing dislike of mathematics that is seemingly associated with "drill-and-kill" pedagogical approaches (Meece, Wigfield, & Eccles, 1990; Middleton & Spanias, 1999).

It is not simply a matter of how noncognitive factors shape students' learning and development. How the educational experience influences students socially, culturally, motivationally, and affectively is also of concern. I wish I could say that the centuries of educational research and practice have resulted in a clear picture of the cognitive and affective transformations that should occur in students as they participate in the formal educational process. But I cannot. There is research suggesting that motivation begins to wane as students progress through school (Wigfield, Tonks, & Eccles, 2004). Evidence of diminished engagement, increased boredom, and learner apathy has also been reported (e.g., Riconscente, 2007). Of course, no one program or intention can hope to do it all. The scope and complexity of the problem is simply too much for any one empirical study, even one that is longitudinal in design. However, at a minimum, we should expect that interventions that speak to academic development at an individual level consider noncognitive variables.

THE MDL

I would like to offer up one modest program of research that I have pursued over the past 10 years and that has sought to investigate academic development in terms of students' learning in academic domains. My approach to studying academic development is the MDL, in which my goal was to document the systematic changes that occur in learners as they progress toward increased competence within recognized fields of study (e.g., Alexander, 1997; Alexander, Jetton, & Kulikowich, 1995; Alexander, Murphy, Woods, Duhon, & Parker, 1997; Murphy & Alexander, 2002). The interplay between three central constructs (i.e., knowledge, strategic processing, and interest), each investigated in two varied forms (i.e., domain and topic knowledge, surface-level strategies and deep-processing strategies, and individual interest and situational interest), serves as the backbone of the MDL. Based on decades of prior research on these constructs, individually and in combination (e.g., Alexander & Judy, 1988; de Jong & Ferguson-Hessler, 1986; Dewey, 1913; Hidi, 1990), I formulated a model as to what changes should transpire in their interrelations should individuals show growth toward increased competence and perhaps even expertise in a specific academic domain.

Thus, as depicted in Figure 1, it was hypothesized that those in the earliest stage of their domain-specific development (i.e., acclimation) have both limited and fragmented domain (breadth) or topic (depth) knowledge upon which they can draw. In part because of the state of their knowledge, students in acclimation also have to use many surface-level strategies that allow them to make sense of the domain-specific problems they confront, and they are less able to delve into deep-processing strategies that allow them to transform or deeply ponder the current situation. Furthermore, this lack of rich domain knowledge and the high strategic demands are complicated by a lack of deep-seated interest in or personal identification with the domain or a given domain-specific task (i.e., individual interest). Rather, learners in acclimation rely on features of the task or the context to pique their interest and motivate their engagement (i.e., situational interest).

If conditions are favorable and the suitable educational experiences are forthcoming, learners can cross the threshold into competence—and thankfully most students who have the benefit of a K–12 education can achieve at least fragile competence in most basic academic domains (e.g., reading, mathematics, history). In effect, competence is an extended stage that is marked by quantitative and qualitative changes in knowledge, strategic processing, and interest. For instance, topic and domain knowledge not only increases, but that knowledge becomes more cohesive or more principled, which is a hallmark of this stage. What is also dramatic and related to this quantitative and qualitative shift in domain knowledge within competence is that learners manifest more deep-processing strategies and a rising personal interest in the domain. Toward mid-level competence, this investment in the domain becomes a compelling force that is marked by individuals' intentional

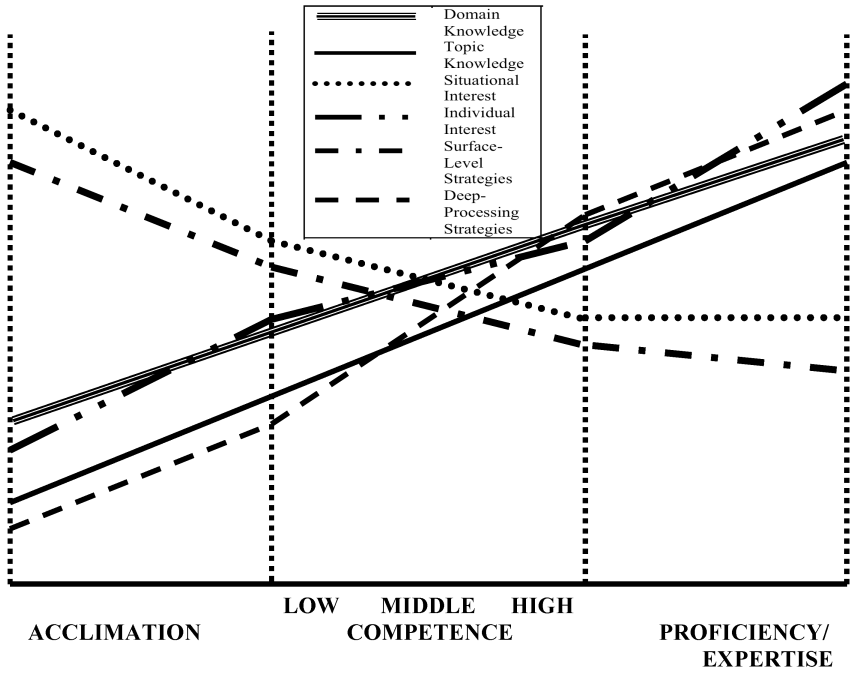

FIGURE 1 A representation of the changing relation of domain and topic knowledge, surface-level and deep-processing strategies, and individual and situational interest over the stages of the model of domain learning.

pursuit of knowledge and experiences related to the field, a transformational process we have documented in the words and actions of competent learners in such diverse domains as reading and history (Fox & Dinsmore, 2009; Maggioni et al., 2009).

For the relatively rare percentage of individuals who reach the stage of proficiency or expertise, their domain and topic knowledge is understandably extensive. Even more indicative of their expertise is that these individuals are expected to be engaged in activities that contribute new knowledge and understandings to the domain. This transformational knowledge comes about, in part, because these individuals are truly engrossed in and self-identify with the domain. Further, their interest helps them strategically engage in problem finding and problem creation—an engagement that is extensively deep-processing in character. It is crucial to note that these attributes of proficiency or expertise cannot be realistically achieved within the confines of typical K–16 education. It is not the mission of K–16 teachers to create domain experts. Nonetheless, the foundations for expertise must be established during these formative years and should be reflected in the goals and experiences that compose K–16 education.

The evidence we have gathered from young students to renowned experts has provided support for the MDL in a range of domains, from biology, astrophysics, and history to reading, educational psychology, and special education (e.g., Alexander, Kulikowich, & Schulze, 1994). Others researchers have found the MDL worthy of exploration as well and have put the predictions of the model to the test in such domains as physical education, social studies, engineering, technology, and music therapy (e.g., Chen, Shen, Scrabis, & Tolley, 2002; Lawless & Kulikowich, 1998; VanSledright, 2002). What these data suggest is that academic development is a promising way to consider the long-term, continuous influence of cognitive and motivational factors on learners and learning. Yet there is much more to be done to test the MDL and to allow for fuller exploration of changes over time within domains and disciplines, that is, to inform understanding of academic development.

Clearly, longitudinal studies that reveal the orchestrated changes in these cognitive and noncognitive forces are necessary, along with studies that explore critical transition periods in the lives of learners at varying ages and in varying sociocultural contexts. We are also concerned with how one first gets a solid foothold in a domain, as in the emergence of children's individual interest (Jablonski & Alexander, 2009) or the manner in which intentionality drives development even in the face of struggles or setbacks (Kulikowich & Alexander, 2009). We are also working diligently to uncover more precise but less intrusive measures of strategic processing (Fox & Alexander, 2009). Although there is much work to be done and far more interdisciplinary inquiry to be initiated, we remain excited about the prospects of discovering more about the nature of human domain learning in the years to come.

Again, this work on the MDL represents just one examination of academic development. It is by no means the only or best approach to investigating academic development. Thus, we look forward to many other investigations into the multitude of factors, situations, or contexts that can illuminate the nature of this intriguing construct and guide us in fostering optimal development for all who walk through the doors of our schools in hopes of becoming well educated. As did the late Robert Gagné (1977), we remain committed to helping students become more competent and more capable of adjusting to the complexities of life in a postindustrial society, not only so that they may survive but also so that they may "find a satisfying quality to their lives" (p. 411).

MOVING BEYOND THE MYTHOLOGY

What I have endeavored to show is that we can no longer allow the educational mythos to survive if we truly intend for formal schooling to set learners on a path toward optimal learning and development. Even though the minimum criteria for a "free and appropriate education" have still to be realized for many, they simply do

not go far enough or move us in the right direction. What is required is nothing short of a reconceptualization as to the very purpose of education and the institution of experiences that allow that purpose to be instantiated. Thus, I propose that we reframe education as academic development, a reframing that demands meaningful attention to the socioemotional and physical well-being of all students as much as to their cognitive growth and advancement.

Such attention cannot occur without an understanding and appreciation of individual differences that exist within classrooms and without a commitment to fostering academic "wellness" in all those who populate classrooms. That means we cannot target only those who are falling behind or who are at risk for doing so, nor can we wait to deal with socioemotional and cognitive issues once they arise. Rather, we must take proactive steps to make certain that we are promoting wellness in all students from the outset of formal instruction. And, certainly, we must labor to ensure that we are not contributing to the academic morass and lethargy that seems all too commonplace within educational environments. Fundamentally speaking, we should feel secure that, with each year of schooling, our students become not only more knowledgeable, more capable of thinking critically and intensively, more hungry for understanding, and more interested in the domains and topics to which they are exposed, but also more emotionally healthy and socially competent.

I am well aware that such "lofty" goals are not simple, easy, or straightforward. Nonetheless, I am convinced that they are the right goals for us to pursue. I am also cognizant of the fact that any success in this regard will demand the commitment and collaboration of many in the academic, public, and political realms. But what is the alternative? Can we withstand another century of misguided reformations that do little to dispel the educational folklore and even reinforce such unfounded beliefs? I say, no!

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