

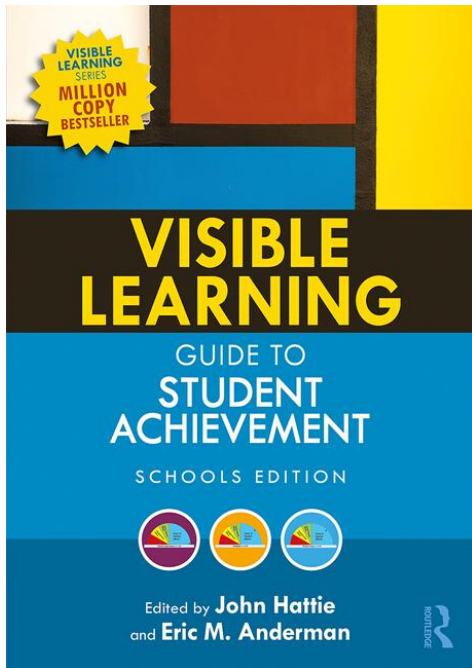


VISIBLE LEARNING

Guide to Student Achievement

Discover how you can improve student learning outcomes and enhance achievement with these instructional strategies based on the latest research

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By John Hattie and Eric M. Anderman

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By John Hattie and Eric M. Anderman

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Understanding achievement

The first edition of the *International Guide to Student Achievement* was designed as a comprehensive resource examining and summarizing influences on student achievement. In that book, we asked an international array of scholars to discuss the major research-based correlates of achievement. The primary aim of this revised edition (*Visible Learning Guide to Student Achievement*) is to provide educators with a more user-friendly compendium of research summarizing these major influences – and with a particular focus on the school sector. As educators throughout the world seek to improve student learning outcomes and thus to enhance achievement, the information presented in this book provides practitioners and policy makers with up-to-date research on academic achievement, along with relevant research-based instructional strategies.

The original *Guide* contained nine distinct sections. In that first edition, each section contained a series of short chapters focusing on a larger thematic topic. For example, one section (“Influences from the Teacher”) contained 18 brief entries, each written by experts, regarding the various ways in which teachers influence student achievement. Each entry had a similar organizational structure, including (a) an introduction, (b) a brief summary of research evidence, (c) recommendations, and (d) conclusions.

Although the previous edition was rich in information, it did not include summary information for each section that provided educators and policy makers with a brief synthesis of major research findings in each area. In this updated edition, each section begins with a brief summary of the major influences on achievement associated with that particular section. This is followed by a few of the key entries from the original *Guide*, all of which have been recently updated by the authors to reflect recent research developments. Each chapter then concludes with a user-friendly “summary table” that synthesizes the key research-based influences on achievement from that chapter. Both the summaries provided at the start of each chapter and the summary tables provided at the end of each chapter succinctly identify the major influences on achievement,

as well as practical implications for educators. All of the summary information reflects both the entries from the original *Guide* and research findings from the updated entries.

What is achievement?

In this section, we briefly (re)introduce the elusive concept of “achievement,” in order to provide a framework for the book. **Academic achievement** is a universally valued educational outcome. Valuing of high achievement is engrained in the fabric of many societies. Parents want their children to achieve at high levels, administrators want their schools to be high performing, regional school leaders (e.g., superintendents) want their regions’ aggregated achievement to be strong, and even politicians want local and national data to be indicative of high achievement. Indeed, throughout much of the world, children learn from an early age that high achievement is necessary in order to succeed both professionally and financially.

It is impossible to avoid the constant messaging that emphasizes the value of achievement in society. For example, the valuing of achievement is accentuated through highly publicized results of large-scale internationally comparative studies (e.g., the Programme for International Assessment [PISA] and the Trends in International Mathematics Science study [TIMSS]), which regularly report that students in some countries achieve at higher levels than others. Achievement scores are also used as a tool to measure the effectiveness of schools or of specific teachers (with these scores being reported widely and publicly). There are even reminders about the importance of achievement in seemingly unrelated aspects of daily life; for example, it is not uncommon for real estate agents to emphasize that a home that is for sale is in a high-achieving neighborhood and thus has more financial value (Seo & Simons, 2009).

Defining achievement

Whereas achievement is highly coveted, there is no universal agreement on what truly constitutes “achievement.” Achievement can be defined in many ways. In the first edition of this book, Guskey (2013) wrote an introductory chapter that provided a framework for understanding this broad construct. Guskey defined achievement, in its simplest terms, as “the accomplishment of something” (p. 3). Guskey noted that in education, achievement is closely tied to learning goals; these could be a student’s personal learning goals, curricular goals or teacher’s instructional goals, as well as a host of other types of goals.

Guskey identified several significant points that should be considered in discussions of student achievement. Those include the following:

- Learning goals (and achievement outcomes that are tied to those goals) can be classified across three dimensions: *cognitive goals*, *affective goals*, and *psychomotor*

goals. Thus, assessments of achievement can focus on cognitive, affect, or psychomotor outcomes (or any combination of those outcomes).

- There are many conceptualizations of cognitive, affective, and psychomotor achievement outcomes. For example, there are many types of achievement outcomes that can be assessed in the cognitive domain (e.g., memorization of facts, ability to solve problems, etc.), the affective domain (e.g., engagement, socioemotional outcomes), and the psychomotor domain (e.g., running speed, performing a specific gymnastics routine).
- School curricula often emphasize cognitive achievement outcomes; nevertheless, achievement in the affective and psychomotor domains, while often not assessed regularly, represent achievement outcomes that should not be ignored. In recent years, educators have begun to recognize the importance of affective outcomes in particular (e.g., Collaborative for Academic, Social, and Emotional Learning, 2019; Frey, Fisher, & Smith, 2019).
- Although achievement can be thought of as a summative construct that encompasses multiple content areas, achievement is usually examined within specific content areas (e.g., mathematics, reading, chemistry, etc.). Moreover, there is some variation in content areas that are taught and assessed across countries.
- Achievement can be conceptualized both in terms of *attainment* of knowledge or skills (i.e., what a student has learned at a particular point in time) or *improvement* in knowledge or skills (i.e., changes in academic performance over time). Both attainment and improvement are valued outcomes, but they represent different types of achievement and need to be assessed differently.
- Measures of achievement are not all created equal; some measures more accurately assess achievement than do others. Thus, the reliability and validity of measures of achievement should be considered in the reporting of achievement outcomes.
- Measures of achievement are designed for many purposes. For example, measures of achievement can be used to assess:
 - Learning upon completion of a specific unit of instruction
 - Learning within a specific course
 - Readiness for postsecondary education
 - Eligibility for instructional support services

It is essential that the purpose for which an achievement measure was designed is aligned with the ways that achievement outcomes derived from those measures are being reported and used.

What variables are associated with achievement?

This book is about correlates of and influences on achievement. Some of the most commonly considered correlates of achievement include demographic variables (e.g., socioeconomic status, age, or gender), noncognitive variables (e.g., motivation

and engagement), school-related variables (e.g., school size, school grade configurations, etc.), and instructional practices (e.g., grouping practices, technology usage, etc.) (Hattie & Anderman, 2013; Hattie, 2009). But in addition to the more typically discussed correlates, achievement also is related to an enormously wide range of other variables (some of which may seem quite odd!). Indeed, a careful examination of the research literature indicates that scholars also have examined the relations of achievement to variables as diverse as body-mass index (which is weakly and negatively related to achievement) (He, Chen, Fan, Cai, & Huang, 2019), homelessness (which is, for the most part, related to lower achievement) (Manfra, 2018), and dietary intake (which is related to achievement through a variety of mechanisms) (Burrows, Goldman, Pursey, & Lim, 2017), among others.

The remaining chapters in this book include discussions of correlates of achievement within specific categories. We have tried to provide information about the correlates of achievement that are most often discussed in the literature and valued by practitioners. The original *Guide* contained nine distinct sections; in this updated version, the former “sections” have been repurposed into shorter chapters. The chapters specifically examine the following influences on achievement:

- Influences from the student
- Influences from the home
- Influences from the school
- Influences from teachers and classrooms
- Influences from the curriculum
- Influences from teaching strategies

In the original *Guide*, we included separate sections examining influences from teachers and classrooms; in this new version, those have been combined into one comprehensive chapter. The original *Guide* also contained two sections that are not included in this updated book. Those included an initial section that contained six entries examining multiple perspectives on understanding the broad concept of achievement and a final section that examined achievement from an international perspective, wherein there were distinct entries examining achievement across a variety of nations (e.g., Russia, Finland, Ghana, and South Korea).

Summary

We believe that this new edition will serve as a practical and useful guide. School personnel throughout the world constantly work toward enhancing students’ academic achievement. We hope that the information contained in this book, which is all rooted in science, can help educators, administrators, and policy makers in their daily work. Numerous interventions, innovations, and novel instructional practices are introduced daily in schools throughout the world; it is our hope that this book can assist educators in critically examining their daily practices and the implementation of new strategies in light of research on correlates of academic achievement.

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Influences from the student

The entries in this chapter focus on influences from the student. By “influences from the student,” we are referring to four distinct types of influences on achievement. First, sometimes academic achievement differs based on student demographic differences. For example, there often is much rhetoric in the media about gender differences in achievement or the effects of socioeconomic status on achievement; variables such as gender and socioeconomic status vary by student and interact with the larger social contexts in which students reside to exert their influences on achievement. In this chapter, our contributing authors present evidence to help separate fact from fiction with regard to these descriptive variables.

Academic achievement is also related to students’ attitudes and dispositions (i.e., students’ feelings, perceptions, and psychological characteristics), as well as to cognitive variables (e.g., students’ current levels of cognitive development). These variables also vary greatly among students; thus within any given classroom anywhere in the world, there is likely to be variability in students’ motivation, engagement, attitudes toward school, level of cognitive development, etc. Some of the entries in this chapter examine variables that are malleable (e.g., attitudes, motivation, and engagement), whereas other chapters focus on more enduring variables (e.g., personality traits). The chapters on cognitive variables focus in particular on the relations of developmental aspects of cognition to achievement.

Finally, there are many social (i.e., contextual) variables that affect individual students’ academic achievement. Whereas a cohort of students may be situated within the same social context (e.g., 30 students may all be learning in the same classroom, with the same teacher, at the same time), each student experiences that classroom uniquely; thus, social variables influence achievement depending largely on how individual students perceive and interpret these social variables. Some examples include peer relationships, preschool learning environments, and students’ social goals.

The entries that appeared in the previous edition are listed below. (Entries with an asterisk have been updated for this edition.)

Entry to School

Collette Tayler

Piagetian Approaches

Philip Adey and Michael Shayer

Entry to Tertiary Education

Emer Smyth

Physical Activity

Janet Clinton

Gender Influences*

Judith Gill

Engagement and Opportunity to Learn

Phillip L. Ackerman

Behavioral Engagement in Learning

Jennifer Fredricks

Goal Setting and Academic Achievement

Dominique Morisano and Edwin A. Locke

Self-Reported Grades and GPA

Marcus Credé and Nathan R. Kuncel

Conceptual Change

Stella Vosniadou and Panagiotis Tsoumakis

Social Motivation and Academic Motivation

Tim Urdan

Attitudes and Dispositions

Robert D. Renaud

Personality Influences*

Meera Komarraju

Academic Self-Concept

Herbert W. Marsh and Marjorie Seaton

Self-Efficacy

Mimi Bong

Motivation*

Dale H. Schunk and Carol A. Mullen

Friendship in School

Annemaree Carroll, Stephen Houghton, and Sasha Lynn

Indigenous and Other Minoritized Students*

Russell Bishop

Low Academic Success

David A. Bergin

Learning Difficulties in School*

R. Allan Allday and Mitchell L. Yell

We briefly describe some of the major student influences on achievement below; these are summarized in the summary table at the end of the chapter.

Demographic differences

Educators, policy makers, and researchers often focus on the relations of individual differences to achievement. Many of these discussions focus on the relations of demographic characteristics of students (e.g., gender and ethnicity) to achievement. Whereas some patterns do emerge, they generally are small when they do. For example, while there is a fairly widespread assumption that males achieve at higher levels in math than do females and that females achieve at higher levels in language arts than do males, evidence for such differences is extremely limited. When gender differences do emerge, they are more pronounced among students from disadvantaged backgrounds. In addition, males are more likely to be diagnosed with attention deficit hyperactivity disorder (which can impact achievement), and females tend to receive higher teacher-assigned grades than do males (Gill, this volume; Voyer & Voyer, 2014).

The relations of ethnicity to achievement are also often discussed and debated. In general, research suggests that ethnic differences in academic achievement are small to nonexistent (Bishop, this volume). In discussions of the relations between ethnicity and achievement, it often is more useful to examine variation within specific ethnic groups, rather than comparing one group to another on measures of achievement (Davis-Kean & Jager, 2014). Research does suggest that achievement varies *within* ethnic groups, with higher achievement being associated in particular with (a) students learning from teachers who value the unique experiences that

students bring into the classroom and (b) having a positive racial/ethnic identity (Bishop, this volume; Miller-Cotto & Byrnes, 2016).

Attitudes and dispositions

Students' attitudes toward learning, as well as more enduring personality characteristics, also are related to academic achievement. Fortunately, many of students' attitudes and beliefs are malleable. This means that teachers and parents can positively influence attitudes and beliefs, particularly when those beliefs hinder achievement.

Many of the entries in the original *Guide* focused on student motivation. Motivation is a broad term that encompasses a variety of mental processes that facilitate the attainment of one's goals (Schunk & Mullen, this volume). Whereas, historically, motivation was viewed as being caused by personality traits and the desire to satisfy basic human needs, motivation researchers now generally view student motivation as having both cognitive and social components (Weiner, 1990). Thus, students' motivation in academic settings is influenced both by what students think (i.e., the cognitive components) and a variety of social influences (e.g., peers, instructional practices, etc.).

The goals that students pursue represent an important component of academic motivation. Research clearly indicates that the goals that students have affect their achievement; these include both goals that students set for themselves and goals that are imposed on students by their teachers, their parents, and their peers (e.g., Rawsthorne & Elliot, 1999; Schunk, 1985). One aspect of motivation that is related strongly to goals is self-efficacy; self-efficacy refers to the belief that one can successfully engage with and complete a specific task (e.g., solve an algebra problem) (Bandura, 2013). Self-efficacy is enhanced when students set short-term, slightly challenging goals and achieve success at reaching those goals (Schunk, 1984). Other motivation variables that vary across students and that are related to achievement include students' attributions (i.e., the reasons to which students attribute academic successes and failures), intrinsic and extrinsic motivation (i.e., motivation to engage with a task because it is enjoyable [intrinsic] or in order to receive a reward or avoid a punishment [extrinsic]), values (i.e., students' beliefs about the importance, usefulness, and likability of a task), and goal orientations (i.e., the reasons why students engage with a task). (For reviews, see Anderman & Anderman, 2014 or Anderman & Wolters, 2006.)

All these motivation variables shape students' perceptions of their own abilities (i.e., their *academic self-concepts*). Academic self-concept can represent both a general perception of one's ability (i.e., a student may see him- or herself as being "smart" or being "dumb"), as well as domain-specific academic self-concepts (i.e., a student may see him- or herself as being "smart" at math but "dumb" at language arts) (Marsh & Seaton, 2013). The relation between academic self-concept and achievement is reciprocal: if a student has a high academic self-concept in a particular

domain (e.g., in the study of biology), that positive self-concept will positively affect achievement; in turn, the high achievement that the student earns in biology further feeds into the student's self-concept of ability.

Academic engagement is related to motivation, albeit somewhat differently. Students who are academically engaged are actively involved in their academic learning (Lei, Cui, & Zhou, 2018). There are three types of engagement: cognitive engagement (e.g., using effective self-regulatory strategies while participating in a classroom activity), behavioral engagement (e.g., behaving appropriately and exerting effort during a classroom activity), and emotional engagement (e.g., expressing joy while participating in a classroom activity) (Fredricks, 2013; Fredricks, Blumenfeld, & Paris, 2004). Students who are highly engaged in their studies achieve at higher levels than those who are less engaged (Ackerman, 2013).

Cognitive

In any discussion of the relations of cognitive variables to achievement, it is essential to recognize the powerful positive relationship between a student's prior achievement and subsequent achievement (Richardson, Abraham, & Bond, 2012). Nevertheless, there often is substantial variability in cognitive abilities among students, and some of this variability is attributable to development. From a developmental perspective, Piaget's classic conceptualization of four stages of cognitive development helps us frame these individual differences. The four stages proposed by Piaget (i.e., sensorimotor, preoperational, concrete operations, and formal operations) are not rigidly aligned with specific chronological ages; rather, researchers and educators have consistently and vehemently argued that movement into a higher stage is gradual and occurs differently for different children (Adey & Shayer, 2013). Thus, two children who share a birth date may be at very different places in terms of their cognitive development; this is not to suggest that the child who appears to be more advanced cognitively is "smarter" than the other child; rather, they are just experiencing cognitive development at different rates.

Another cognitive variable that has been examined by educators in recent years is conceptual change. Conceptual change occurs when current knowledge structures (i.e., long-held beliefs) change in order to facilitate the learning of new information that conflicts with one's prior knowledge. Although conceptual change is often discussed in the domain of science, conceptual change can occur in all academic domains (Vosniadou & Mason, 2012) and is influenced by cognitive, motivational, and affective variables (Sinatra, Kienhues, & Hofer, 2014). Certain instructional methods (e.g., teaching with analogies or asking students to make predictions) can facilitate conceptual change and, ultimately, greater achievement (Vosniadou & Tsoumakis, 2013).

Social

The chapter also contains several entries that focus on relationships of student-level variables to achievement from a social perspective. Whereas the word “social” implies interactions involving more than one person (i.e., beyond individual differences), students experience the social milieu of schools in different ways. Whereas students are always in social settings while they are at school, their perceptions, experiences, and interpretations of the events that occur in their schools vary, thus leading to differential effects on achievement. Moreover, social or “contextual” variation both within and across classrooms also affects achievement differentially across individual students.

Students’ friendships emerge as a particularly salient and obvious influence on achievement. Friendships affect achievement in numerous ways, and friendships have differential effects on achievement as children move from the early school years into secondary school settings (Carroll, Houghton, & Lynn, 2013). In general, research indicates that both working with friends on schoolwork and having friendships are positively related to achievement (Wentzel, Jablansky, & Scalise, 2018). Moreover, students’ friendships also influence their educational goals (Urdan, 2013); thus, a student who maintains friendships with peers who value school is likely to also value school and thus set achievement-oriented goals.

The larger social contexts of schools and classrooms also affect achievement. For example, achievement is affected by the ability of one’s student peers within a school; specifically, individual students who attend schools along with many high-ability peers may have lower academic self-concepts, which may in turn affect achievement (the “Big-Fish-Little-Pond-Effect”) (Becker & Neumann, 2018; Marsh & Seaton, 2013). In addition, the training of teachers who work in a given school also can have differential effects on achievement; for example, young children whose teachers have received substantial training in child development tend to experience achievement benefits (Tayler, 2013).

2.1

Gender influences

Judith Gill

Introduction

Few topics have generated such vigorous and ongoing debates in recent decades as have those concerning the relationship between gender and achievement. In the 1970s, when the talk was about sex differences in learning outcomes, it seemed that many educationists were inclined to believe the nostrums of early psychology, wherein young people were understood to have innate and inevitable differences in their capacity to learn that were reliably demonstrable in learning outcomes. This thinking was about to undergo rapid and fundamental change with the move from thinking of “sex” as fixed and innate to “gender,” which was seen as produced by the learner’s social context in conjunction with his or her innate potentials. By 2011, the term “sex” had virtually disappeared from the public lexicon and been replaced by “gender” on forms for individual inscription and social reporting and accounting. This change in terminology followed from research results demonstrating that the old truths were no longer universally applicable in terms of male and female differences in learning outcomes, along with science’s incapacity to account for the differences that were seen to occur. The following text will offer a broad overview of what we now know about gender and achievement and what we still do not know.

Research evidence

In the mid-1970s, the first major review was conducted into sex differences in thinking. Based on hundreds of preceding American studies on the topic, Maccoby and Jacklin (1974) produced their analysis of the combined results and concluded that there were very few reliable and consistent differences in mental functioning between boys and girls: so few, in fact, that they advised great caution in restating them for fear of perpetuating some of the myths. The researchers insisted that there

was far greater variation within either population of girls or boys than between them. The one item they cautiously identified concerns the superior performance of boys from age ten in mental spatial rotation – a feature often associated with superior mathematical performance in males, although its explanatory capacity is much more limited. Subsequently, a prominent British researcher published his review of the British studies of sex differences in cognition and came to the same conclusion (Fairweather, 1976). In this case, he added that the differences were least likely to appear the younger the population tested, giving support to the idea that what were still called sex differences in thinking were socially produced rather than innately given. Despite the clarity of these findings, the high repute of the researchers, and the fact that the finding of no or very little difference continues to be demonstrated (Halpern & Mamay, 2000; Hyde & Linn, 2006), these results did not indicate the end of the story.

The decades following the 1970s produced many examples of research investigating gender differences in schooling outcomes in terms of the subjects girls and boys chose to study, the scores they obtained, their proceeding to tertiary education, and their capacity to engage in the highest levels of intellectual life. Initially, this research typically showed girls trailing boys in a range of performance measures, most notably grades in math and science. Additionally, it was noticed that the gender gaps in student achievement were seen to increase with age, suggesting that schooling processes may work to increase these gender differences rather than reduce them. This perception led to many studies of classroom treatments in the attempt to identify ways in which teaching practice might be implicated in the construction of gender difference (Gill, 1992; Sadker & Sadker, 1994).

During the 1980s and 1990s, there was much activity inspired by feminist efforts to address gender inequity in girls' schooling. Classroom research was dedicated to monitoring the inclusion of girls and their interests, teaching materials were scrutinized to avoid featuring males at the expense of females across the broad spectrum of adult roles, and girls were targeted and encouraged to enroll in nontraditional subject areas, especially math and science. In many respects the movement to improve girls' educational outcomes was successful: girls now are seen to get higher grades than boys, and more of them complete school. Girls are enrolling in math and science in significant numbers in high school, albeit not quite as commonly as are boys, and many progress to university and choose courses not open to women of previous generations.

While the success story holds true for many middle-class girls, if less so for girls from disadvantaged backgrounds, by the mid-1990s the situation for boys had become a cause for widespread concern. Boys began to emerge as significantly less successful than girls in terms of learning outcomes. Researchers write of a "small but pervasive tendency for females to score better on standardized tests and to achieve more post school qualifications" (Gibb, Fergusson, & Horwood, 2008, p. 63). Increasing numbers of research papers appeared, addressing what became known as the "crisis" in boys' education. Studies showed boys as

more likely than girls to get referrals for behavioral issues, to present with reading problems, to be identified with ADHD, and to drop out of school before completion. For example, US statistics for the 2003–2004 school year show that 26% of female students became school dropouts, compared to 34% of male students. Reports of male underachievement have come from across the developed world (Thiessen & Nickerson, 1999; Tinklin, Croxford, Ducklin, & Frame, 2001; Weaver-Hightower, 2003; Younger & Warrington, 2005). Tallies of high school graduations show girls as the more successful group: more of them go on to university and more of them gain undergraduate degrees – albeit in the fields of education and health, which are not renowned for providing access to the status and power of some other professions. By 2009, for the first time in the United States, more women than men graduated with master’s degrees. By this time the focus in investigations of gender equity in education had turned to the situation of boys. As New Zealand researchers Gibb et al. concluded, “The trend of male underachievement has been evident for at least the last decade” (Gibb et al., 2008, p. 63). Male underachievement is particularly prevalent among boys from disadvantaged backgrounds whose situation is made more evident with the demise of ready employment in unskilled trades and manufacturing. However, it is also the case that middle-class boys continue in the main to do well in school. However, the media hype around the “boys’ crisis” was constructed around a gender wars scenario as though all girls were doing well and all boys were not. Of course, the situation is much more complex (Gill & Starr, 2001; for a fuller discussion, see Gill, Esson, & Yuen, 2016).

While girls appear as more reliable in terms of passing grades than their male peers, one area still stands out in the research and popular understanding of gender differences in enrollment and achievement: namely science, engineering, technology, and mathematics (STEM). Numerous studies have attempted to demonstrate and explain gender differences in achievement in these areas and have led to a mixed bag of conclusions. For example, it has been alleged that girls’ lower achievements in these areas are largely due to their choosing against these courses in high school and, consequently, having less experience with numerical and scientific ways of thinking. This situation leads to the question of whether the girls would do better if they were not able to choose courses of study. However when senior school results for these subjects are compared, a higher proportion of girls is frequently found among the high performers, which is explained in terms of the more selective group of girls who form the minority enrollment in these areas. On the other hand, studies continue to show that, among the very high performers as evidenced by competitions such as the Mathematics Olympiad and industry-led, country-specific prizes, boys are consistently more likely than girls to be among the winners (Ellison & Swanson, 2009).

One interesting outcome of the Programme for International Student Assessment (PISA) analyses is that the variation in student performance within the participating European countries is many times larger than the variation between countries. However, differences in test items and survey methodologies make

generalizations extremely difficult, with at least one study showing that the gender difference in reading is a product of the test items rather than the individual responses (Lafontaine & Monseur, 2009). Moreover, PISA results suggest that the most consistent and visible gender difference relates to girls' advantage in reading, a gender gap that emerges early and is maintained with age, such that by age 15, there were "significant differences in favor of females reported for virtually all European countries" (Eurydice, 2010, p. 34). There is some indication in this work that the recorded differences result from different patterns of school attendance, with boys tending to start school later and being more likely to be required to repeat a year, thus testing that records achievement against age should also account for difference in schooling patterns and treatments.

In mathematics, the gender differences were less pronounced and less stable than those for reading. A 1995 survey showed that gender difference in mathematics in the fourth year of schooling was small or nonexistent. A similar "no difference" outcome was found at year eight. It was not until the final year of secondary school that the males emerged with significantly higher mathematical achievement in all countries except Hungary (Eurydice, 2010, p. 35). Other, comparable tests found similarly inconsistent results, with gender gaps visible only intermittently across age and culture.

A more promising line of research has been carried out by Hyde and colleagues, who argue that there is a much more consistent and demonstrable similarity between males and females in mathematics and science capabilities than there is a difference (Hyde & Linn, 2006). Based on a meta-analysis of gender differences in mathematics across a sample of 100 studies testing more than three million students, Hyde's team was able to show the traditional gap in favor of males had disappeared, an outcome that had been predicted by neuroscientist researchers for some time (Rogers, 2001). This latter case repeats a theme from analyses of the gender and achievement research: that is, the differences that used to be understood as a result of the genetic makeup of males and females have, in reality, been produced by their different treatment within the social context. Hyde notes that the lack of gender difference in math achievement does not explain the ongoing gender disparity in STEM enrollments, which continue to favor males. Recent research suggests that such differences in enrollment patterns may be a product of culturally laden gender-appropriate perceptions in concert with different levels of self-confidence and individual capacity.

Psychological research has revealed consistent male/female differences in the capacity to hold to an image of a successful self. For example, Renold and Allan, in an English study, describe a bright girl who "deprecated her achievements whenever she was praised and systematically denied her flair for academic work" (Renold & Allan, 2007, 463). These writers describe the girls as struggling with the "precarious balance" between achieving academically and acceptable femininity. In a Canadian study, Pomerantz and Raby (2011, p. 555) write of bright girls holding "academic achievements close to their chest as a secret to be guarded" in a paper

identifying the complexity of girls' engagements with narratives of academic success. In their analysis of the range of contradictory discourses around girls' performance of academic identities, the need to mask ability for fear of contaminating the idealized construction of acceptable femininity is a familiar theme. The widely reported analysis of gender equality in the OECD studies of student achievement levels suggested that highly able girls "choke" on the pressure they experience from friends, family, and themselves, a situation which renders them unable to perform at their best.

Given girls' keen desire to succeed in school and to please others, their fear of negative evaluations, and their lower self confidence in mathematics and science, it is hardly surprising high-achieving girls choke under often self-imposed pressure.

(OECD, 2015)

This report seems to blame the girls for being girls – wanting to "please others" and having "lower self confidence" and putting pressure on themselves. In the final analysis, the report presents the girls as underachieving: an outcome that is "hardly surprising" – indeed almost expected. The girls' shortcomings have been identified as their own fault! Not surprisingly, then, the conclusion is somewhat ambivalent:

[G]ender disparities in performance do not stem from innate differences in aptitude, but rather from students' attitudes towards learning and their behaviour in school, from how they choose to spend their leisure time, and from the confidence they have – or do not have – in their own abilities as students.

(OECD, 2015, p. 3)

Despite the increasing recognition of girls as top students, the idea that their success comes at a price is a reiterated theme in educational research. Questions about female academic success continue to be raised, as seen in the OECD report mentioned earlier and in studies of the difficulties of successful women in male-dominated professions, which identify outcomes that suggest the ongoing complex negotiations required for girls and women achievers (Mills, Franzway, Gill, & Sharp, 2014).

Having rejected the explanation of gender differences in educational outcomes as being due to lack of intellectual capacity, the challenge for research is to explain the persistent gender differences that continue to occur. One explanation for this phenomenon is that the girls are responding (both consciously and subconsciously) to contextual cues that continually reinforce the idea of male superiority and leadership as gender-based entitlements and that this image becomes grounded in the habitus of girls and women. Hence, in striving for an acceptable form of femininity, girls avoid positioning themselves as success stories, especially in terms of public roles when they could be seen as in competition with

men. While this syndrome of female underestimation of ability and hiding success compared with male overestimation of ability and lauding their success was initially demonstrated in the 1970s, research continues to reveal the same feature in studies of professional women right up to the present time (Sandberg, 2013; Heilman & Okimoto, 2007). As summarized by Sheryl Sandberg in her bestselling book about women and leadership:

I believe this bias [against women's success] is at the very core of why women are held back. It is also at the very core of why women hold themselves back. For men, professional success comes with positive reinforcement every step of the way. For women, even when they're recognized for their achievements, they're often regarded unfavorably.

(Sandberg, 2013, p. 40)

Given that this syndrome – of males being celebrated for success and females being downgraded – appears as early as elementary school, the challenge is surely for teachers to create an environment in which success is recognized and celebrated without the gender-related overtones.

Researchers have called for greater gender sensitivity in teachers, along with programs in teacher education that alert potential teachers to the ways in which they may operate to reinforce traditional limitations – or to help students overcome them. The ideal educational experience is that all students understand themselves as “can-do” learners as the optimum preparation for becoming fully participative and engaged citizens.

Summary and recommendations

Much has been learned in recent years from the research on gender and achievement. We now know that the traditional generalizations have little basis in hard evidence and that boys and girls are much more likely to have similar abilities than to be divided in terms of capacity. If we must talk of gender differences in educational outcomes – and we take seriously the warnings of researchers about not wishing to further the difference case! – we should say only that girls as a group emerge as the more reliable scholars in terms of passing grades, whereas there are some indications that boys are more spread across the scale, with some found among the very high achievers as well as others at the lowest underachieving end. By and large, however, the evidence that there is a far greater area of similarity than of difference between girls and boys in terms of learning capacities appears most compelling.

The implications for teaching that follow are that teachers should encourage the young people in their charge to explore and learn unhampered by outdated gender roles. The research shows that gender differences are more often developed in terms of the learner's social context than as a result of innate propensities. The

challenge for teachers is to develop all students in ways that maximize potential. This is surely best done by using teaching methods and materials that include men and women as equal active participants in the world beyond school.

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2.2

Learning difficulties in school

R. Allan Allday and Mitchell L. Yell

Introduction

Learning difficulties present a myriad of academic and behavioral challenges to schools and teachers due to their effect on achievement. Numerous factors are associated with learning difficulties; however, these factors typically funnel into similar outcomes that are often linked to low academic achievement and poor social functioning. Identifying factors that lead to learning difficulties requires pinpointing the primary sources of influence within schools.

Three distinct groups (i.e., students, teachers, and schools) contain specific factors and characteristics that impact school achievement. For example, student factors, such as presence of a disability, socioeconomic status, or family involvement, can affect achievement. Teachers who lack training in effective practices for struggling learners and effective classroom and behavior-management strategies can magnify learning difficulties. Finally, school factors can affect student achievement through the established school-wide climate and expectations. Each of these groups (i.e., student, teacher, and school) influences achievement, and they are interconnected; therefore, focusing on these three groups can help identify effective practices that can increase the success of students with learning difficulties.

Research evidence

Defining school achievement is necessary before addressing how student, teacher, and school factors can impact academic and behavioral success. It also requires consideration of a school's role in a student's life: that is, schools function as mediators to prepare students for successful competitive employment and a socially well-adjusted adult life. In order to prepare students to achieve these outcomes, schools must focus on the attainment of the academic and behavioral skills necessary for productive and socially engaged adults. For the purpose of this discussion,

achievement is defined as success within the school environment in the areas of academic functioning (e.g., reaching skill mastery, performing at or above expected levels) and behavioral functioning (e.g., exhibiting appropriate social skills, engaging in school-appropriate behavior).

Student factors

There are a number of causal mechanisms that affect students prior to entering primary school. The presence of a disability, whether physical, intellectual, or behavioral, can impact school success (Lane, Carter, Pierson, & Glaeser, 2006). Other mechanisms, such as family structures and neighborhoods (Herberle, Thomas, Wagmiller, Briggs-Gowan, & Carter, 2014; White & Renk, 2012) affect student outcomes. Considering these mechanisms, it is clear that individual students enter primary school with different skills and experiences that will impact academic successes as well as social productivity (e.g., social skills, behavioral regulation).

Academic and behavioral challenges often occur simultaneously within the student and impact school success (Algozzine, Wang, & Violette, 2011). Academic challenges among students with learning difficulties can be exacerbated through their behavior. Students with learning difficulties may engage in inappropriate behavior to escape academic tasks (Burke, Hagan-Burke, & Sugai, 2003). In contrast, students with learning difficulties may experience negative peer interactions (Baumeister, Storch, & Geffken, 2008) and withdraw from academic engagement to avoid peer interaction. Student responses to academic tasks and social situations within the school directly impact achievement and social successes.

Schools and teachers can only plan for student characteristics, but are limited in what they can control outside of school functions. For example, schools cannot control the presence of a disability, familial structures, or neighborhoods; however, schools can control experiences within the school building. Providing students with effective teachers and a school environment that supports learning is vital to negate the effects of student characteristics. The following sections relate to how teacher and school characteristics can improve academic achievement and limit learning difficulties.

Teacher characteristics

Teachers are the most important mediators of knowledge within schools. They must understand how to initiate learning so that the full spectrum of students can be successful. As inclusion of students with academic and behavioral difficulties increases in the general education classroom (i.e., mainstreaming), teachers must be effective in providing instruction to students with a wide spectrum of skills. Instructional practices and classroom/behavior management strategies are two primary factors that can hinder a teacher's ability to address learning difficulties effectively.

Instructional practices often affect student behavior. Scott, Hirn, and Alter (2014) reported results of over 1,000 observations showing that student engagement

increased and disruptive behavior decreased as teachers were providing instruction. This suggests that teachers who are actively instructing their students will increase student learning behaviors (i.e., engagement). Teachers who are well trained to instruct students with learning difficulties understand that effective instructional practices can be successful with *any* student. Unfortunately, some teachers are ill prepared to instruct students who learn at slower paces or require additional academic or behavioral supports (Allday, Neilsen-Gatti, & Hudson, 2013). Therefore, un- or underprepared teachers may avoid students with learning difficulties for lack of understanding of how to remedy the challenges. For example, students who struggle with new concepts tend to slow the pace of instruction. This slowing of instruction can cause the struggling learner to be overlooked or unintentionally ignored by teachers. It helps in maintaining lesson pacing to overlook low-performing students; however, it does not address those students' learning difficulties.

A solid foundation in classroom and behavior management is a second factor that can limit teacher effectiveness in improving achievement. Teachers who do not have good management skills are more likely to remove students from the classroom. The likelihood of a student gaining academic skills decreases when that student is removed from the learning environment. Teachers with a strong foundational understanding of management principles know that students who struggle academically may be more apt to exhibit problem behaviors in order to escape task demands. Utilizing group contingencies can assist teachers in combating problem behaviors (Maggin, Pustejovsky, & Johnson, 2017). Another challenge for teachers with poor management skills is stopping instruction to address problem behavior. The more frequently a teacher stops the lesson, the less content that can be covered during instruction. Proximity control and effective questioning are two strategies effective classroom managers can use to continue lessons while addressing problem behavior.

Moving forward in reducing or eliminating learning difficulties, teachers must better prepare to teach students who have academic and behavioral challenges. Specifically, teachers must embrace teaching methods known to be effective (e.g., direct instruction) and be more hesitant to use unproven methods. Often, teachers can use simple techniques such as guided notes or increased opportunities to respond to assist students with learning difficulties. For example, Konrad, Joseph, and Eveleigh (2009) conducted a meta-analysis supporting the use of guided notes in improving academic achievement of students with learning difficulties. MacSuga-Gage and Simonsen (2015) found in their systematic review of literature that teacher-directed opportunities to respond improved both academic and behavioral outcomes. Utilizing research-validated methods increases the possibility of maximum content coverage and overcoming academic deficits.

Teachers must learn strategies to reduce challenging behavior while promoting socially appropriate alternative behaviors. As with academics, teachers can use simple management strategies (e.g., proximity control, effective questioning) to address student behavior. When teachers employ proven methods to increase positive behaviors, they should see an increase in academic achievement.

School characteristics

Effective schools provide environments that encourage academic growth and reinforce socially appropriate behaviors. Effective schools meet student needs through hard work and staff perseverance and overcome many factors that potentially impede school effectiveness. For instance, learning can be affected by issues posed by low socioeconomic status in a school, as well as urban or rural challenges. Schools, however, can focus on factors in which they have more control, such as developing a learning climate and collaborative teamwork that builds upon student success.

Historically, schools have taken a punitive approach to managing behavior that disrupts the learning environment. Although this approach is effective with many students, it is less effective in reducing problem behaviors of students with chronic behavior problems. Often, students with consistent problem behaviors receive progressively more intense levels of punishment (e.g., from office referrals to suspensions to expulsions). Students who receive suspensions and expulsions are disadvantaged in academic achievement because of removal from the learning environment. For schools to address the learning difficulties of students with challenging behaviors, it is necessary to address student engagement in the learning environment.

A second school-wide factor that can affect achievement is an atmosphere of collaborative teamwork with the school. Schools that fail to create effective communication between administration and staff limit their effectiveness. Students with learning difficulties may exhibit different behaviors with different teachers. When teachers fail to communicate effective strategies for particular students, they may decrease the likelihood of student success in all classes. An additional challenge in communication among school staff is the sharing of academic and behavioral data. If teachers view data as “my data” versus “our data,” then they may be less likely to work collaboratively in analyzing the data and developing interventions.

Addressing learning difficulties at a school-wide level requires individual schools and districts to be prepared to address their students’ various academic and behavioral issues. School-wide positive behavior supports and interventions (PBIS) have proven to be a successful method of addressing some of these issues (Horner & Sugai, 2015). PBIS has been an endeavor aimed at creating a welcoming learning environment that promotes socially appropriate behavior. Within the system of PBIS, there are several effective practices that can help schools better meet the needs of students with learning difficulties. Specifically, school staff must collaboratively define common objectives, develop teaching methods for expectations, follow through with set procedures, and evaluate program effectiveness (Sugai & Horner, 2002). Freeman et al. (2015) examined the effects of PBIS from 883 high schools. The authors noted that, among the school data examined, office discipline referrals (ODRs) decreased and attendance increased when PBIS was implemented with fidelity. These two findings support the reduction of learning difficulties through

increased access to instruction. This approach (i.e., PBIS) addresses student and teacher behavior through encouraging positive behavior and requires that schools train their teachers in effective practices.

Summary and recommendations

Identifying factors that support and maintain learning difficulties in school is a challenge that researchers, educators, and school administrators must continue to resolve. These factors can be numerous and complex but present themselves in various forms of academic and behavior problems. It is unknown if academic or behavior problems arise first; therefore, teachers and schools should work to *teach* academic skills and to *teach* behavior skills (Algozzine et al., 2011). Two goals can be reached through teaching academic and behavior skills. First, learning difficulties in schools can be reduced when students are presented with effective instruction. Second, academic achievement can be increased when schools and teachers reinforce positive student behaviors.

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2.3

Indigenous and other minoritized students

Russell Bishop

Introduction

A seemingly intractable problem that besets modern education in the Western world is how to raise the achievement levels of indigenous and other minoritized students so that the educational disparities that afflict these students can be addressed. The term *minoritized* refers to a people who have been ascribed the characteristics of a minority (Shields, Bishop, & Mazawi, 2005). To be minoritized, one does not need to be in the numerical minority but only to be treated as if one's position and perspective are of less worth, to be silenced or marginalized. Hence, for example, in schools on the Navajo reservation with over 95% of the population being Navajo or in Bedouin schools, we find characteristics of the students similar to those we may find among Māori in mainstream schools in which they are actually in the numerical minority. Also included in this category are the increasing number of migrants into European countries, populations of color or poverty, and those whose abilities and sexual persuasions do not belong to the perceived mainstream.

There are numerous explanations for why indigenous and other minoritized groups from around the world continue to suffer from the immediate and long-term effects of educational disparities on employment, social well-being, and health. These theories include deficit notions about the paucity of literature in the children's homes, the lack of positive educational experiences and expertise among their families, the lack of motivation among particular groups of students, the negative impacts of peer cultures, the impact of the generally low socioeconomic status of the families, the impact of child poverty and abuse, the lack of positive role models (including those of successful members of indigenous and other minoritized groups in schools), and the neocolonial nature of the school system. It is a feature of most of these theories that they focus either on the problems that the child and their families present to the school or that the school presents to the families. Less common are explanations that focus on what actually happens

between the participants in education: that is, the relationships that exist within the school's classrooms and between the school and the families within the wider society or the impact of the power imbalances that exist in the wider society that are reflected and reproduced within the nation's classrooms.

Research evidence

Fundamental to this analysis of explanatory theories about the phenomena of low achievement among indigenous and other minoritized students is the understanding that when teaching occurs, progress is decided upon and practices are modified as “a direct reflection of the beliefs and assumptions the teacher holds about the learner” (Bruner, 1996, p. 47). This means that “our interactions with others are deeply affected by our everyday intuitive theorizing about how other minds work” (Bruner, 1996, p. 45). To Foucault (1972), such theorizing is seen in the images that teachers create in their minds when explaining their experiences of interacting with indigenous and other minoritized students. These images are expressed in the metaphors they use that are part of the language or the discourses around education that have already existed for considerable periods of time and that struggle against each other for explanatory power. It is through these metaphors that teachers subsequently organize classroom relationships and activities. Hence, discourses have a powerful influence on how teachers and those with whom they interact understand or ascribe meaning to particular experiences and what eventually happens in practice. In short, particular discourses will provide teachers with a complex network of explanatory images and metaphors, which are then manifest in their positioning, which then will determine, in large part, how they think and act in relation to indigenous and other minoritized students.

The impact of teachers' discursive positioning on indigenous and other minoritized student achievement is seen when it is understood that some discourses hold solutions to problems that affect these students while others do not. For example, if the discourse that the teacher is drawing from explains indigenous and other minoritized students' achievement problems in their classroom as being due to inherent or culturally based deficiencies of the children or of their parents and families (Valencia, 2012; Vass, 2012), then the relationships and interactions that teachers develop with these children will be negative, and they will engage students in low-quality pedagogic content and skill programs such as remedial activities or resort to traditional transmission strategies. In addition, and perhaps not surprisingly, indigenous and other minoritized students will react to this experience negatively, with consequent negative implications for their attendance (they will often vote with their feet), engagement and motivation for learning (they will be met with behavior modification programs and assertive discipline), and achievement (which remains lower than that children of the majority cultural groups in the classroom, and in many cases in the world, the gaps continue to widen).¹ Conversely, if the discourse offers positive explanations and solutions,

then teachers will more likely be able to act in an agentic manner, seeing themselves as being able to develop quality caring and learning pedagogic relationships with indigenous and other minoritized students. When such contexts for learning are developed, as evidenced in the Te Kotahitanga project (Bishop, Berryman, Powell, & Teddy, 2007; Bishop, Berryman, Tiakiwai, & Richardson, 2003; Bishop, 2011; Bishop, Ladwig, & Berryman, 2014; Ministry of Education, 2015), which focuses on improving the achievement of indigenous Māori students in mainstream public secondary schools in New Zealand, Māori students respond positively with measurable increases in engagement, attendance, retention, motivation (Bishop, Berryman, Powell et al., 2007; Meyer et al., 2010), and achievement (Bishop, Berryman, Wearmouth, Peter, & Clapham, 2011; Meyer et al., 2010; Sleeter, 2011). Further studies support this conclusion (Castagno & Brayboy, 2008). The first example considered the determinants of student leadership in schools, thereby determining the keys to improving student achievement (Dempster, 2011). The argument is that “it is the immediacy of the sense of connection and belonging they experience with their teachers and their peers that governs the sense of identification students have with their schools. Only then is engagement in all aspects of learning, curricular and cocurricular, enhanced, and once this occurs, the desire to take on leadership responsibilities in matters of school citizenship is elevated” (p. 97). Dempster continues by suggesting that

how well children and young people are treated by their families, teachers and peers is a fundamental influence on how well they become connected to their schools. Furthermore, there is support for the proposition that experience of reasonable empowerment and a climate of participatory social engagement (both factors influencing leadership), are known to develop in students the very social, emotional and cognitive attributes that facilitate improvements in academic achievement.

(p. 97)

The second example is a meta-analysis by Cornelius-White (2007) based on 119 studies with 1,450 effects, which was based on 355,325 students, 14,851 teachers, and 2,439 schools. In this analysis, there was a correlation of 0.34 ($d = 0.72$) across all person-centered teacher variables and all student outcomes (achievement and attitudes). Hattie (2009) uses these results to argue that in classrooms “with person-centered teachers, there are more engagements, more respect of self and others, there are fewer resistant behaviors, there is greater non-directivity (student initiative and student-regulated activities), and there are higher student achievement outcomes” (p. 119).

The third example is our own research into means of changing teacher theorizing and practice in ways that will bring about improvements in the schooling experiences and achievement of Māori students in mainstream public schools. In 2001, we began the research for Te Kotahitanga by talking with groups of Māori students in years 9 and 10, together with members of these students’ families,

school principals, and teachers, about their collective schooling experiences. From these interviews, a series of narratives of experience were developed (Bishop & Berryman, 2006). In contrast to the majority of their teachers, who tended to dwell upon the problems that the children's deficiencies caused them, the children clearly identified that the main influence on their educational achievement was the quality of the in-class relationships and interactions they had with their teachers. They also explained how teachers could create a context for learning in which Māori students' educational achievement could improve by teachers changing the ways they related to and interacted with Māori students in their classrooms. It was clear from their experiences that if Māori students were to achieve at higher levels and educational disparities were to be reduced, then teachers must relate to and interact with these students in a different manner from the most commonly occurring approaches.

From these interviews, we developed an Effective Teaching Profile (ETP) (Bishop, Berryman, Tiakiwai et al., 2003) that formed the basis of the Te Kotahitanga professional development innovation, which is now running in 49 secondary schools in New Zealand. In these schools, the most effective implementers of the ETP are those who see Māori student schooling experiences improve dramatically and achievement rise to the highest levels in norm-referenced standardized tests.

Fundamental to the ETP are teachers' understandings of the need to explicitly reject deficit theorizing as a means of explaining Māori students' educational achievement levels and their taking an agentic position in their theorizing about their practice. In order for teachers to attain these understandings, they need to be provided with learning opportunities for critically evaluating where they discursively position themselves when constructing their own images, principles, and practices in relation to Māori and other minoritized students in their classrooms. They also need an opportunity to consider the implications of their discursive positioning on their own agency and for Māori students' learning. Practitioners need to be able to express their professional commitment and responsibility to bringing about change in indigenous and other minoritized students' educational achievement by accepting professional responsibility for the learning of all their students, not just those who they can relate to readily. These central understandings are then manifested in these teachers' classrooms when effective teachers demonstrate on a daily basis that they care for the students as culturally located individuals; they have high expectations for students' learning; they are able to manage their classrooms and curriculum so as to promote learning; they are able to engage in a range of discursive learning interactions with students or facilitate students to engage with others in these ways; they know a range of strategies that can facilitate learning interactions; they collaboratively promote, monitor, and reflect upon student's learning outcomes so as to modify their instructional practices in ways that will lead to improvements in Māori student achievement; and they share this knowledge with the students (Bishop, 2011).

Summary and recommendations

Positive classroom relationships and interactions are built upon positive, nondeficit, agentic thinking by teachers about students and their families. Agentic thinking views the students as having many experiences that are relevant and fundamental to classroom interactions. This agentic thinking by teachers means they see themselves as being able to solve problems that come their way and as having recourse to skills and knowledge that can help all their students, and they believe that all of their students can achieve, no matter what. Agentic thinking is fundamental to the creation of learning contexts in classrooms where young Māori people are able to be themselves as Māori, to bring who they are into the classroom, where Māori students' humor is acceptable, where students can care for and learn with each other, where being different is acceptable, and where the power of Māori students' own self-determination is fundamental to classroom relations and interactions. Indeed, the interdependence of self-determining participants in the classroom creates vibrant learning contexts, which in turn are characterized by the growth and development of quality learning relations and interactions, increased student attendance, and engagement and achievement both in school and on nationally based measures.

Fundamental to these classrooms is teachers' discursive (re)positioning, which is a necessary but often overlooked condition for educational reform; the sufficient conditions are the skills and experience teachers need to develop effective caring and learning relationships. In this way, theorizing from within a relational discourse addresses the limitations of the culturalist position that promotes quality teaching but gives limited consideration to the impact of power differentials within the classroom, school, and society such as those that manifest themselves in teachers drawing upon deficit discourses to explain their use of ineffective pedagogies. It also is preferable to the structuralist position that promotes a redistribution of resources and wealth in society yet gives only limited consideration to the agency of teachers and school leaders and policy makers at all levels of education, allowing them to abrogate their responsibilities. While both of these considerations are necessary, what is missing from much current debate about the influences on (indigenous and other minoritized) students' achievement is a model that promotes effective and sustainable educational reform drawn from a relational discourse.

Note

1. It is interesting that when challenged over their "closing the gaps" policy in the early 1990s, the then–New Zealand government chose to abandon the policy and instead focus on "realising Māori student potential." However, there are a number of problems with this new focus. First, it is a much more elusive target and is extremely difficult to define and, in fact, is left undefined, in government policy documents (Ministry of Education, 2008), other than statements about Māori students having unlimited potential and abilities.

Second, most teachers that we interviewed during our research used deficit terms when they spoke of Māori students (Bishop et al., 2003). This means that the power of defining what constitutes Māori potential is, in practice, left to a group of people who think Māori potential is limited, not unlimited. In policy terms, to leave the determination of Māori potential in the hands of what is essentially a non-Māori teaching force, most of whom see Māori potential as being limited, can only be described as careless. Rather, it is essential to have an outcome measure that is not open to sabotage by deficit thinking, which does not go away just because antideficit thinking is suggested in a policy document.

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2.4

Personality influences – the Big Five and achievement

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Introduction

Student success is a central goal of educational organizations worldwide. In achieving this objective, educators are encouraged to look beyond cognitive ability and investigate psychosocial factors that influence academic achievement. A spotlight on nonintellectual factors is needed, particularly at the college level, where students' ability within a cohort is restricted by admission criteria (Furnham, Monsen, & Ahmetoglu, 2009). In highly selective programs that enroll students who are more homogeneous in intellectual ability, differences in student achievement at the time of graduation are explained by noncognitive factors. For instance, two students entering a college or university may have similar standardized test scores and high school grade-point averages (GPA) yet the degree of success they achieve in college is influenced by noncognitive variables such as personality, motivation, self-efficacy, information processing style, intellectual engagement, and effort regulation. This chapter focuses mainly on untangling the relationship between the Big Five personality traits and academic achievement.

Research evidence

Over the past three decades, the Big Five theory of personality has emerged as a robust and parsimonious conceptual framework of personality. Empirical evidence establishes it as an important predictor of academic achievement assessed as course grades, overall exam scores, or college GPA (O'Connor & Paunonen, 2007). Of the Big Five personality traits, conscientiousness is the single most consistent and strongest significant predictor of academic performance beyond cognitive ability (Conrad, 2006; Furnham & Chamorro-Premuzic, 2004; Higgins, Peterson, Pihl, & Lee, 2007; Noffle & Robins, 2007). Regarding the relationship between the four other Big Five traits (openness, agreeableness, extraversion, and neuroticism) and

academic achievement, research findings are inconsistent or nonexistent (Chamorro-Premuzic & Furnham, 2003). For instance, in a meta-analysis that included about 25 studies, O'Connor and Paunonen (2007) report a mean correlation of .24 between conscientiousness and academic performance and mixed results for openness and extraversion. A more recent meta-analysis of 20 studies also found conscientiousness to be the strongest predictor of GPA, followed by openness and agreeableness (Vedel, 2014). Likewise, another meta-analysis of primary education revealed that conscientiousness and openness in children, as rated by adults, significantly predicted academic performance (Poropat, 2014). A longitudinal study of Swedish children in upper secondary education showed, that after controlling for intelligence, conscientiousness and neuroticism were positively associated with academic performance (Rosander & Backstrom, 2014). Similarly, high conscientiousness, high openness, and low extraversion predicted academic achievement in Russian and Slovenian children (Zupančič, Kavčič, Slobodskaya, & Akhmetova, 2016). This body of research suggests that, although cognitive ability scores inform us about what students can do, their personalities unveil what they are likely to do. For example, students who score high on conscientiousness are more likely to be hardworking, thorough, disciplined, and achievement oriented, and those who score high on neuroticism are more likely to be anxious, worried, and inclined to give up or avoid coming to class if they think they are not doing well (Chamorro-Premuzic & Furnham, 2003). In attempting to unravel the relationship between personality traits and achievement, researchers have focused on several intermediate or causal mechanisms, including achievement motivation, perfectionism striving, self-regulation, deep processing of information, regular class attendance, and coping strategies.

A comprehensive meta-analysis of 65 studies by Judge and Ilies (2002) revealed that the link between personality and motivation is complex. They found consistent associations between three types of performance motivation (goal setting, expectancy, and self-efficacy) and two personality traits, conscientiousness (in a positive direction) and neuroticism (in a negative direction). On further scrutiny, Chamorro-Premuzic and Furnham (2003) state that, although some of the broad personality traits (conscientiousness positively, and extraversion and neuroticism negatively) explain 15% of the variance in exam grades, the narrower facets (achievement striving, self-discipline, and activity) have a stronger relationship and explain much more (about 30%) variance in exam scores. Since conscientiousness and achievement motivation (the capacity to persist in the face of difficulties, obstacles, or failures) are both significant predictors of GPA, even after controlling for standardized entrance exam test scores (Richardson & Abraham, 2009), some researchers have examined their interrelationship more closely. Conscientiousness seems to include a component of achievement motivation as highly conscientious students seem to be motivated to succeed (Higgins et al., 2007). This is supported by Nofle and Robins's (2007) finding that the relationship between conscientiousness and GPA is mediated by students' self-reports of how much effort they put into their studying and their perceptions of their overall academic ability as

well as verbal ability. There is also support for the notion that students who are driven to accomplish are more likely to obtain higher GPAs if they are also more conscientiousness; they need to be disciplined and organized, follow through, and remain persistent despite facing difficulties (Komarraju, Karau, & Schmeck, 2009). As conscientiousness is associated with both intrinsic and extrinsic motivation, highly conscientious students might remain internally motivated despite fluctuations in environmental rewards (Hart, Stasson, & Mahoney, 2007). Highly conscientious students are also likely to be orderly, strive for perfectionism, and aspire to high standards (Kim, Chen, MacCann, Karlov, & Kleitman, 2015). They tend to do well academically as they strive for perfection, avoid procrastination, and cautiously review details to reduce errors (Boysan & Kiral, 2017; Rikoon et al., 2016). This empirical evidence draws attention to the achievement motivation component of personality traits (particularly conscientiousness) in explaining academic achievement.

Besides achievement motivation, self-regulation has emerged as a causal mechanism that influences student performance and achievement. Almost two decades ago, Pintrich (2000) highlighted the importance of self-regulation and then Bidjerano and Dai (2007) noted that effort regulation fully mediated the individual relationships between GPA and the personality traits of conscientiousness and agreeableness. Pintrich (2000) found that highly conscientious individuals tend to be better self-managers and are able to regulate themselves more effectively. Conscientious students also display greater metacognition (Kelly & Donaldson, 2016) as well as proactive and initiating behavior as they plan, monitor, gather feedback, and reflect on whether or not their learning strategies are working (Bidjerano & Dai, 2007). They are responsible, disciplined, achievement oriented, organized, and proactive as they are driven to achieve their goals (Higgins et al., 2007). Conscientious students who display autonomous motivation and seek to make independent choices are more likely to be motivated to pursue high academic performance (Zhou, 2015). Likewise, conscientious West Point military cadets tend to do well academically as they exert self-control and manage their interpersonal behavior more intentionally (Mayer & Skimmyhorn, 2017). Conscientious students also tend to be efficient when multitasking and use step-by-step processing (Stock & Beste, 2015) and are able to manage and control their emotions, making them more likely to achieve higher GPAs (Ivcevic & Brackett, 2014). In a cross-national sample (the US and South Korea), conscientiousness and emotional stability predicted self-efficacy as well as performance (Stajkovic, Bandura, Locke, Lee, & Sergeant, 2018). The qualities of being organized, efficient, self-disciplined, and self-directed are crucial in college because, unlike in high school, parents and teachers no longer offer constant reminders or monitoring, and students have to self-regulate and manage themselves.

The extent to which students process information deeply and meaningfully appears to be an important determinant of achievement. Highly conscientious students appear to use deep and strategic learning strategies that help them achieve higher academic performance (Duff, Boyle, Dunleavy, & Ferguson, 2004). In

addition, Chamorro-Premuzic and Furnham (2008) note that 40% of the variance in academic performance measured through end-of-year comprehensive essay exams was explained incrementally by ability, two personality traits (conscientiousness and openness), and learning strategies. What is particularly noteworthy is the finding that individuals with high ability performed well because they were more open (displayed intellectual curiosity), and those who were more open performed well because they processed information more deeply. Other researchers also support the importance of elaborative and meaningful processing of information for academic performance. To illustrate, students scoring high on the Big Five personality trait of openness also reported using critical analysis and deep processing, leading to greater comprehension, and this was associated with academic achievement even after controlling for ability and attendance or effort (Farsides & Woodfield, 2003). Similarly, in a study predicting national secondary school exam performance for 212 secondary school students, Furnham et al. (2009) found that, although intelligence tests predicted a majority of the variance in the academic performance test, a deep processing and achieving learning approach was a significant predictor of exam scores. Thus, empirical evidence certainly highlights the importance of a deep and thoughtful approach to learning as a link between personality traits and academic achievement.

Classroom behaviors that are associated with personality traits, such as attending classes, conforming to task directions, and participating in group discussions, appear to have important roles in achieving academic success. For example, class absences incrementally predict final course grades beyond intelligence and the Big Five traits; conscientious and agreeable students are more likely to attend class seminars, and those attending regularly achieve better performance (Farsides & Woodfield, 2003; Conrad, 2006). Dollinger, Matyja, and Huber (2008) offer similar empirical support through their findings that the variance in exam scores is predicted not only by factors that are not under the control of students such as verbal ability, personality traits, and past performance, but also by controllable factors such as attendance and hours spent working or studying. In taking a closer look at the facets of the Big Five, McCann, Duckworth, and Roberts (2009) found that industriousness was a stronger predictor of absenteeism, compared to the broad conscientiousness factor, and perfectionism was a stronger predictor of cognitive test scores and attaining high academic honors, compared to the broad conscientiousness factor. These results are supported by Kappe and van der Flier (2010), who found that conscientiousness was positively associated with attending lectures, acquiring skills, working on group projects, obtaining on-the-job training, and completing a thesis. They also found that extraversion was positively associated with performance on tasks involving interacting with others and expressing or articulating ideas, neuroticism was negatively associated with performance under time pressure or being observed, and openness was negatively associated with conforming to group project deadlines. Thus, these results suggest that the Big Five personality traits influence preferred ways of behaving that influence task accomplishment and academic achievement.

As students interact with their academic careers, they often face unexpected situations and obstacles. How well they cope with adversity appears to be related to the personality traits of conscientiousness and neuroticism. For instance, Perera, McIlveen, and Oliver (2015) found that first-year Australian college students who were more conscientious displayed higher levels of attentional control, narrowed their focus to avoid distraction, and continued planning and persisting in the face of obstacles. In contrast, students reporting higher levels of neuroticism were more likely to experience higher levels of affective-physiological stimulation in stressful situations and became inhibited and disengaged academically, rather than actively managing the stressors. Similarly, Chinese undergraduate business majors with a proactive personality were more likely to seek opportunities and perform well academically in the face of challenging and stressful situations (Zhu, Wei, & Wang, 2017).

Summary and recommendations

This review establishes that personality traits have a distal influence on academic achievement through mechanisms such as motivation, self-regulation, deep processing, attendance behavior, encouraging perfection striving, reducing procrastination, and enhancing coping strategies that are more proximal to achievement. Schools and teachers could utilize this information to construct syllabi, curriculum, classroom interventions, and learning environments that foster and reward achievement motivation, self-regulatory efforts, deep processing, and conscientious behavior (particularly industriousness). In particular, educators could implement interventions that help students who might be experiencing stressful or adjustment issues by developing effective coping strategies that enhance academic engagement. Future researchers could further our understanding of the link between the Big Five personality traits (specifically, facets of conscientiousness and neuroticism) and academic achievement by exploring other causal mechanisms.

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2.5

Motivation

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Introduction

Motivation is the process whereby goal-directed activities are instigated and sustained (Schunk, Meece, & Pintrich, 2014). We do not directly observe motivation but rather its outcomes: selection of activities, effort, persistence, and achievement. Because motivation always involves goals, it is necessary to characterize one's level of motivation relative to those goals. To illustrate, imagine that high school students Kevin and Alex have a test tomorrow. Kevin's goal is to make a good grade, so he studies for four hours. In contrast, Alex's goal is to pass the test, so he studies for 30 minutes, spending the bulk of his evening social networking with friends. While both students are motivated, Kevin has higher academic motivation in contrast with Alex, whose social motivation is higher.

Research evidence

There are various theories of motivation (Schunk et al., 2014). Historically, theorists viewed motivation as reflecting such processes as instincts, needs, and drives. Humanistic psychologists, Abraham Maslow and Carl Rogers among them, emphasized the need for personal growth, achieving wholeness, and self-actualization. Conversely, behavioral psychologists contended that motivation was superfluous because reinforcement strengthened behavior, and punishment weakened it. Motivation reflected the rate and duration of behavior. These historical views construed motivation as something that affected the performance of previously learned behaviors more than new learning.

As cognitive theories of learning gained ascendance in the 1960s, researchers began investigating cognitive and affective variables that can influence learning and performance (Shuell, 1986). One can have a goal to learn a skill (learning goal) or to demonstrate a learned skill (performance goal). Researchers currently explore the conditions, variables, and attitudes that affect motivated learning.

Motivation can influence what, when, and how people learn (Schunk et al., 2014). Students approach learning tasks with different goals, self-efficacy (perceived capabilities) for learning, values (perceived importance of learning), and affects (e.g., excitement, fear). They decide how they will work on the task (i.e., their learning strategy). While engaged in learning, learners are influenced by instructional (e.g., materials, feedback) and contextual variables (e.g., peers, environmental conditions). They monitor their understanding and gauge their learning progress. Perceptions of progress build self-efficacy and sustain motivation. When difficulties arise, they may seek help or alter their strategy. Following task engagement, they may reflect and make attributions (perceived causes) for their outcomes (e.g., success due to hard work). Students who believe they are progressing toward valued goals are apt to sustain their motivation, self-efficacy, and positive affect. In mentoring relationships, students (i.e., protégés) benefit the most when they and their mentors share the desire to attain success and, thus, hold high achievement motivation. As achievement motivation increases, protégés may be more motivated to learn from their relationships and mentors, and to engage in mentoring as well (Schunk & Mullen, 2013).

Reviews of motivational research support the influence of these processes on learning and achievement. Goal properties have motivational effects (Locke & Latham, 2002). Goals that incorporate specific standards of performance can be attained relatively quickly; in contrast, goals that are moderately difficult are more likely to sustain motivation and lead to better performance than are goals that are general (e.g., “Do your best”), long-term, and overly easy or challenging. Self-evaluations of goal progress build self-efficacy and motivation (Schunk et al., 2014).

Self-efficacy influences learning and achievement through effort and persistence (Schunk & DiBenedetto, 2016). Multon, Brown, and Lent (1991) found that self-efficacy related positively to academic outcomes and accounted for 14% of their variance. Effects were stronger for older (high school, college) students and when self-efficacy and performance measures reflected specific rather than general tasks (e.g., standardized tests).

Values have been shown to relate positively to achievement-related choices, including course enrollments, occupational choices, college majors, and sports participation (Wigfield, Tonks, & Klauda, 2016). Pekrun (2016) reported that positive affective states influence motivation and learning through their effects on cognitive engagement and use of strategies.

Attribution research shows that successes ascribed to internal and stable causes, such as ability (e.g., “I’m good at this”), result in higher expectancies for future successes than attributions to external and unstable causes, such as luck (e.g., “I made lucky guesses”) (Graham & Taylor, 2016). For difficulties, more adaptive attributions are those to unstable and controllable causes, such as low effort (e.g., “I didn’t study enough”) and poor strategy (e.g., “I used the wrong method”).

Studies on the effects of interventions designed to promote motivation have shown that motivation and achievement are enhanced by the following: having learners pursue proximal and specific goals; teaching them to set their own goals;

having students observe peer models who learn by expending effort and persisting; showing students video recordings of their own performances demonstrating learning; rewarding students for their performance improvements; stressing the value of learning to students, and providing them with feedback linking their improved performances to increased effort (Schunk et al., 2014).

Certain variables can moderate the influence of motivation on learning and achievement. Children's cognitive capacity limits their abilities to represent distant goals in thought, segment long-term goals into short-term goals, and evaluate their progress (Schunk et al., 2014). They also may overestimate what they can do. They are motivated by goals that can be attained quickly and by immediate consequences of actions. With cognitive development, children's capabilities for goal setting and self-evaluation improve.

Cultural factors also affect motivation. Researchers have found that self-efficacy often is lower among non-Western (e.g., Asian) students than for students from Western Europe, Canada, and the United States (Klassen, 2004); however, the former students' self-efficacy aligns more closely with their actual performances, whereas the Western students overestimate what they can do. How students interpret perceived causes may vary due to culture. In some cultures, ability may be thought of as uncontrollable (similar to intelligence), whereas individuals in other cultures may interpret it more akin to specific skills that can be learned. Academic motivation may suffer when the practices of schools and students' cultures conflict (e.g., individual versus group learning) (Kumar & Maehr, 2010).

Student differences in mind-sets and interests can affect motivation. Persons with *fixed* mind-sets assume that capabilities are set and that one cannot change much, whereas those holding *growth* mind-sets equate ability with learning (Dweck, 2006). Students with growth mind-sets may be more motivated to set learning goals and evaluate their progress, believing they can improve their skills.

Students also vary in their interests. Some may be *intrinsically* motivated to engage in activities for their own sake, whereas others may be *extrinsically* motivated as means toward ends (e.g., praise, rewards). Whether offering students rewards decreases their intrinsic motivation is a source of debate (Cameron & Pierce, 2002). Research shows that rewards given commensurate with performance improvements convey that students are becoming more capable and can foster motivation and self-efficacy (Schunk et al., 2014).

Motivation is a complex topic, and questions continue. One is whether motivation – which presumably operates before, during, and after task engagement – is distinct from *volition* or the processes that protect concentration and effort from distractions while a student is working on a task or activity (Schunk et al., 2014). Whether motivation and volition are separate or overlap, it is useful to think of motivation at different phases of task engagement. Thus, choice of activities is a motivational outcome but often is not relevant because students may not be able to decide whether to engage in particular learning.

A second question is how motivation fits with cognitive accounts of learning. Motivational processes have cognitive referents (e.g., self-efficacy beliefs), which

presumably are stored along with other cognitive information. Early cognitive learning theorists were not settled on this score, but recent cognitive theories address motivation (Winne & Hadwin, 2008).

Summary and recommendations

Research on academic motivation has implications for educational practice. Motivation is improved when students set goals and evaluate their progress. If rewards are used, they should be given contingent on students' improving their capabilities. It is also helpful to show students how learning will help them perform better. Learners can be taught to attribute learning difficulties to causes they can control, such as low effort or poor use of strategies. Lastly, linking learning to students' interests can improve motivation. For example, teachers' creative use of technology should appeal to today's students, thereby increasing their motivation to learn.

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Summary table: influences from the student

Category	Variable	Considerations
Demographics	<p>Gender differences in achievement are minimal; when they do occur, they are generally more pronounced among students from disadvantaged backgrounds. An exception is that males are more likely to be diagnosed with ADHD and to drop out of school than are females.</p> <p>There is some evidence of lower achievement for children who were born preterm and were underweight at the time of birth, particularly through middle childhood.</p> <p>Indigenous and minoritized students sometimes do not experience the same academic successes that their majority peers experience.</p>	<p><i>Students may believe that girls and boys have different abilities, even though in reality differences are minimal.</i></p> <p><i>These students may need additional academic support.</i></p> <p><i>Indigenous and minoritized students are more likely to achieve at high levels when teachers value the experiences that these students bring to the classroom and acknowledge power differentials and the ways that classroom discourse affects power structures in the classroom.</i></p>
Attitudes and Dispositions	<p>Personality is not strongly related to academic achievement. The one exception is that high levels of the personality trait of conscientiousness are related positively to achievement.</p>	<p><i>Conscientiousness seems to be related to a greater likelihood of students engaging in specific behaviors and using strategies (e.g., avoiding procrastination) that facilitate academic achievement. An awareness of these relationships can guide educators in providing supports to students so that they learn, practice, and use effective strategies.</i></p>

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Category	Variable	Considerations
	<p>Student engagement is related positively to academic achievement; however, high-ability students may still achieve at high levels, even when their engagement is less than optimal.</p>	<p><i>Programs to address low student engagement need to focus in particular on enhancing engagement in lower-achieving students.</i></p>
	<p>Behavioral engagement is a broad construct; in general, behavioral engagement is characterized by positive conduct (e.g., following classroom rules), involvement in learning (e.g., paying attention), and involvement in school activities. Behavioral engagement is related to academic achievement and to retention in school.</p>	<p><i>Teachers can promote behavioral engagement by creating a caring social environment in the classroom, establishing clear rules and expectations, and infusing the curriculum with meaningful activities.</i></p>
	<p>When students set specific and somewhat challenging academic goals, they achieve at higher levels.</p>	<p><i>Students often need to be instructed in how to set appropriate goals. Students will persist with academic goals if they feel confident that they are making progress toward the goal; thus, teachers should provide students with feedback on progress toward goal attainment.</i></p>
	<p>Motivation refers to the processes that facilitate the attainment of one's goals. Motivation is a very broad term that encompasses many processes and that vary across students, across tasks, and over time. Examples of these processes include students' self-efficacy beliefs, attributional beliefs, and their beliefs about the value of a task.</p>	<p><i>Educators can promote motivation (and, ultimately, higher achievement) by helping students (a) set specific, reachable goals and (b) evaluate their progress toward achieving those goals. Motivation also can be promoted by providing exposure to examples of peers who can successfully engage in and succeed at specific tasks, rewarding students for improvement, and fostering the development of positive value beliefs toward a particular task or subject area.</i></p>
	<p>Students' attitudes toward academics are related to achievement but not very strongly. The relationship appears to be strongest among upper elementary students.</p>	<p><i>Although the relation is not strong, teachers should still do all that they can to support the development of positive attitudes toward specific academic subject domains. Creating positive experiences in classrooms can simultaneously affect both attitudes and student motivation to achieve.</i></p>

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Category	Variable	Considerations
	<p>Academic self-concept refers to a student's perception of his or her ability. Academic self-concept within a particular domain (e.g., math) is most strongly related to achievement in that domain.</p> <p>Academic self-efficacy refers to the belief that one can successfully engage with and complete a particular academic task. A student who feels highly efficacious toward a particular academic task (e.g., solving algebra problems) is likely to experience success with that task.</p>	<p><i>The relation between academic self-concept and achievement is reciprocal: having a high self-concept of ability in a particular domain (e.g., math) leads to higher achievement in that domain and that high achievement, in turn, can further enhance one's academic self-concept. Thus teachers should focus both on improving students' academic self-concepts, and improving their achievement (e.g., by giving them useful feedback and helping them make appropriate attributions).</i></p> <p><i>Self-efficacy beliefs are more strongly related to achievement when the beliefs are specific to the task at hand, as opposed to general beliefs about one's overall ability. Teachers can help students become efficacious at tasks by (a) setting moderately challenging short-term goals, (b) helping students to develop skills by creating experiences in which students can master tasks, (c) observing models that can successfully engage with the task, (d) providing feedback that fosters the development of adaptive attributions, and (e) helping students to become confident as they are presented with increasingly complex versions of the task.</i></p>
Cognitive	<p>When new information that is presented in class conflicts with a student's prior knowledge and beliefs, effective learning of the new information often requires conceptual change.</p>	<p><i>It is possible to facilitate conceptual change through classroom instruction; however, conceptual change does not occur quickly. In order to teach for conceptual change, educators must acknowledge that it takes time to change long-held beliefs and incomplete or inaccurate prior knowledge. There are a variety of evidence-based strategies that can be used; some examples include teaching with analogies, introducing alternative explanations with refutational texts, and asking students to make predictions, which are followed by evidence that conflicts with the predictions.</i></p>

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Category	Variable	Considerations
	<p>When students experience learning difficulties, these difficulties may be attributable to a wide range of causes. Such difficulties may be attributable to student characteristics (e.g., a disability), teacher characteristics (e.g., instructional practices), or school characteristics (e.g., school-wide approaches to discipline for bad behavior). Learning difficulties often occur as a result of more than one of these factors.</p> <p>Piaget's four stages of cognitive development are still useful tools in the planning of instruction. The four stages represent broad ranges of cognitive development, and appropriate instruction at each stage facilitates student learning.</p> <p>Prior achievement (including self-reported grades) is a very strong predictor of future achievement.</p>	<p><i>It is often difficult to discover the root causes of students' learning difficulties. Educators should not conclude that the problem lies solely within the student. Sometimes achievement is hindered due to teacher behaviors or school policies. Moreover, learning difficulties may arise as a result of multiple causes simultaneously (e.g., both a characteristic of the student and the use of an ineffective instructional practice).</i></p> <p><i>Educators should not think of Piaget's stages as rigid categorizations; educators must realize that children and adolescents of the same chronological age may be at different stages of cognitive development. Thus, two children who are each ten years old may differ in their readiness to learn from an identical curriculum.</i></p> <p><i>Students who have achieved highly in the past are likely to continue to achieve at high levels in the future; nevertheless, if some students have not done well in school in the past, they still have the potential to learn at high levels, but they may need extra instruction and support.</i></p>
Social Influences	<p>Early and effective preschool experiences are very important predictors of subsequent academic achievement. Students who experience low academic success during the early grades often continue to experience these difficulties during the later grades.</p> <p>Children experience academic benefits when teachers of young children (e.g., kindergarten teachers) have received appropriate training in child development.</p>	<p><i>Exposure to effective early childhood educational programs can greatly benefit students in both the short and the long-term. Given that children vary in their exposure to effective programs, teachers must acknowledge that students do not come to school equally prepared.</i></p> <p><i>School administrators should provide professional development for teachers of young children so that educators are prepared for the unique needs of young learners.</i></p>

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Category	Variable	Considerations
	<p>The secondary school that a student attends impacts the likelihood of enrolling in post-secondary education.</p>	<p><i>In some secondary schools, there is a strong emphasis on college preparation; in such schools, most (if not all) students are expected to attend college. This is often tied to socioeconomic status (i.e., these schools often enroll students from affluent neighborhoods).</i></p>
	<p>Students' social goals are related to academic motivation and, in turn, to achievement. Social goals can both facilitate and hinder achievement, depending on the types of social goals that the student pursues and the academic behaviors of the students' peer group.</p>	<p><i>Teachers can better help students achieve if they are attuned to both students' goals and the social dynamics of students in their classrooms. If a student's peers value education and doing well in school, then the student is likely to also value education and doing well; however, if peers devalue education, that can undermine a student's academic achievement.</i></p>
	<p>Friendships affect achievement, although these effects vary with age. Young children develop friendships through playing with others. During middle childhood, higher achievement is generally associated with greater peer acceptance. The effects of friendships on achievement grow stronger during adolescence as students tend to be friendly with peers who have similar interests and similar attitudes toward school.</p>	<p><i>Teachers should be aware that friendships affect achievement, although the effects of friendships on achievement change as children grow older. Adolescents who affiliate with peers who do not value academics may benefit from opportunities to engage in school-based activities that are well supervised and that provide opportunities for those adolescents to develop relationships with new peer groups that value education.</i></p>
	<p>Greater physical activity is related to higher achievement.</p>	<p><i>Provide opportunities for students to be physically active during the school day; such activity may enhance both academic achievement and emotional well-being.</i></p>
	<p>The Big-Fish-Little-Pond Effect refers to situations in which students who learn in schools or classrooms populated by high-ability students have lower academic self-concepts than students who learn among average- or lower-ability students. This can affect achievement, in that students may not work to their potential in environments that undermine their ability beliefs.</p>	<p><i>Teachers and administrators need to carefully consider the many effects of grouping students by ability. Whereas it is often easier for teachers to instruct classrooms comprised of students of similar abilities, not all students benefit equally from such environments.</i></p>

Note: This table summarizes information presented by authors who contributed chapters to section 2 of the first edition of The International Guide to Student Achievement, as well as to revised chapters included in the present chapter.

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