The purpose of this chapter is to examine the issue of 21st-century skills, focusing specifically on cultural, linguistic, and motivational aspects. The chapter begins with the current context and then moves to a focus on how current developments are likely to shape and modify educational practice, with a particular focus on literacy. A discussion follows about what we have learned from the 20th century related to these issues and focuses on the educational experiences and outcomes of students from diverse language and cultural backgrounds and the ways that schools have addressed these concerns. The chapter then moves to a focus on addressing the needs of these students from a research and policy perspective, both in terms of what has been done and what might need to be different. Given the focus of this volume, the focus is on literacy, although, as argued later in the chapter, the divisions between cognitive, affective, and social dimensions of language, literacy, and learning are less pronounced and important than once thought.

The Current and Future Context

The Work Context

It is useful to begin by considering the current context in terms of what a successful individual needed to meet societal demands both in terms of literacy and life experience during the last half century. In that work context, the normal expectations were that one would hold one or two jobs in one’s lifetime, master one area of expertise or field of study, compete for jobs and resources primarily at the local level, engage in hands-on and fact-based work tasks and activities, receive an institution-based and degree-based education, and work in a top-down organization or institution (Institute of Museum and Library Services, 2009). In contrast, as the 21st century unfolds, it is more than likely that an individual will hold 10 to 15 jobs; be required to simultaneously master many rapidly changing fields; face global competition for employment; work in an interactive work setting that is technical in nature, requires completion of nonroutine tasks, and requires creative problem solving; receive education that is learner centered, lifelong, and partially or wholly delivered through technology; work in settings that are dynamic, flexible, and rarely top-down; and experience problems that are very complex and that occur in unpredictable environments.
These changes have been marked, since the last half of the 20th century, by changes in the industrial economy based on manufacturing, which has now shifted to a service economy driven by information, knowledge, and innovation. Scholars in business and economics have documented the nature of this shift. For example, in 1967, the production of material goods (e.g., automobiles, chemicals, industrial equipment) and delivery of material services (e.g., transportation, construction, retail) accounted for nearly 54% of the U.S. economic output. By the beginning of the 21st century, information services grew from 36% to 56% of the economy (Apte, Karmarkar, & Nath, 2008; Karmarkar & Apte, 2007). Of course, technology will play no small part in this continuing and dramatic change. Already, student use of computers to find information has been growing exponentially: 94% of students now use the Internet for at least some portion of their writing assignments for school (Lenhart, Arafteh, Smith, & Macgill, 2008). Although routine cognitive work and routine manual labor jobs were prevalent in the last several decades, these are the exact types of tasks that are easiest to automate with computers. Thus, jobs will increasingly emphasize expert thinking and complex communication for ill-structured problems, the kind which are more difficult for computers to handle (Levy & Murnane, 2004).

One important consideration that overlays this entire discussion and the issues raised in the remainder of the chapter is the issue of curriculum control and the purpose of education. Who or what should drive educational priorities? Is the purpose of schooling to serve as a simple training camp for industrial and corporate purposes? Or is the purpose a broader one that involves producing critical thinkers who are informed, self-regulated learners who are active and engaged citizens and community members? Is there a danger in shifting all educational priorities to fit corporate needs? How will the issue of privatization play in to the preparation of both teachers and students? What implications does this have for the diverse students who make up an increasingly large component of the U.S. population? As Dede (2010) notes, the primary barriers to altering curricular, pedagogical, and assessment practices are not conceptual, technical, or economic, but instead psychological, political, and cultural. These lenses should be kept in mind as the chapter unfolds, and the implications for teachers, students, and the larger society should be considered.

Interesting, at the same time that the shifts noted above are occurring, major changes in the makeup of the U.S. population are occurring as well. These are briefly summarized next.

The Changing Population
A recent report by the U.S. Census Bureau (2008) documents some of the changes that will take place in the United States in the near future, including the fact that the country will have an older and more diverse population. For example:

- Minorities are currently about one-third of the U.S. population. By 2042, they are expected to become the majority, and by 2050 they will compose about 54% of the population. This trend will occur earlier for children
because more than half of all children will be from minority groups by 2023.

• It is projected that by 2030, the point at which baby boomers will be at least 65, they will compose about 20% of the population, more than doubling the 2008 number of 38.7 million.

• The population that is 85 and older will increase at an even faster rate, more than tripling by 2050 from 5.4 million in 2008.

• By 2049, the U.S. population is expected to reach over 400 million, and minorities will compose about 236 million of that total.

• There will only be a slight change in the non-Hispanic, single-race white population between the present time and 2050 (203.3 million vs. 199.8 million). It is expected that this group will lose about 20% of the total population share, dropping from 66% (the current level) to about 46%.

• Between now and 2050, the Hispanic population will nearly triple from the current level of 46.7 million, approximately doubling their percentage of the total population to 30% of the total. More than one-third of the population is expected to be Hispanic.

• The black population will increase only slightly by 2050, from 14% (41.1 million currently) to 15% (65.7 million).

• Asian Americans will almost double their percentage of the total population (from 5.1% to 9.2%), and their actual numbers will increase from 15.5 million to 40.6 million.

• Groups that make up a smaller percentage of the total population, such as American and Alaskan Indians, will only increase slightly (from 1.6% to 2% of the total population). Similarly, native Hawaiians and Pacific Islanders will more than double in number from 1.1 million to 2.6 million.

• An interesting demographic phenomenon is the growth of mixed-race Americans, who will more than triple their current number of 5.2 million.

• The population composition of children is changing as well. About two-thirds of the children will be from minority groups, an increase from the current level of 44%. The percentage of Hispanics in this group will increase from 22% now to 39% in 2050, while white children will decrease from 56% now to 38% then.

• By 2050, about 55% of the working age population will be minority, up from the current level of 34%. About a third of this group will be Hispanic, about 15% will be black, and about 10% will be Asian American (Campbell, 1996; U.S. Census Bureau, 2008; Vincent & Velkoff, 2010).

Language differences are a big factor in these changes as well. The number of school-age children (ages 5–17) who speak a language other than English at home more than doubled their percentage of the population from 10% to 21% in the three-decade span between 1980 and 2009 (Aud et al., 2011).
One of the interesting features of this increased diversity is the heterogeneity of the diverse populations, that is, diversity within diverse groups. For example, the term English learner is commonly used in the literature dealing with language instruction issues. Yet, examination of data from a large urban district such as Los Angeles, for example, indicates that there are over 99 different language groups (Los Angeles Unified School District, 2009). Across the United States, there are more than 400 language backgrounds among English learners (Capps et al., 2005). Although Spanish speakers represent the overwhelmingly largest language group, this group is anything but heterogeneous, as many authors have noted (Durgunoglu & Goldenberg, 2011). This group ranges from very recent immigrants with no English skills to long-term English learners who are natives by birth but have limited literacy skills in their native language, and whose academic literacy skills in English are not as well developed as their oral skills (Callahan, 2006). Additionally, they often have backgrounds that reflect a wide range of cultural practices and understandings.

As elaborated on later, this accelerating diversification will challenge efforts to erase or improve already existing student performance and achievement gaps both within the United States as well as in the global context.

A Focus on 21st-Century Skills and New Literacies

21st-Century Skills

Given the existing and future changes that have been detailed, what are the implications for what one needs to know and be proficient at to succeed? What are the more specific proficiencies in literacy that will be required? Most often these are discussed in the context of 21st-century skills (National Research Council, 2010), or the set of skills, which many argue, that will be required to successfully navigate future life and work demands. It is clear that what was needed in the 20th century is different from what is and will be required in the 21st century primarily because of the emergence of very sophisticated information and communications technologies. However, there are different visions.

The National Research Council (2010) has elaborated the following as essential: adaptability, complex communication/social skills, nonroutine problem solving, self-management/self-development, and systems thinking. There are other conceptual frameworks that have tried to propose a vision of what 21st-century skills should look like, but perhaps the most comprehensive and frequently referred to framework comes from the Partnership for 21st Century Skills (2011). This organization has proposed a wide-ranging set of skills in a variety of domains as part of their framework. In addition to specific skills such as creativity and innovation in the domain of learning, this proposal includes a range of literacies in domains such as information and technology, and life and career.

There are several other organizations and groups that have offered similar visions, including the North Central Regional Educational Laboratory and the Metiri Group (2003), the Association of American Colleges and Universities (2007), and
the Organisation for Economic Co-operation and Development (OECD; 2005). There are other groups and individuals who have tried to explicate needed skills and competencies in ICT specifically, including the revised ISTE (International Society for Technology in Education; 2000) student standards for technology in the curriculum, as well as digital literacy standards from the International ICT Literacy Panel (2002). In addition to organizations, individual scholars such as Dede (2005) have also formulated lists of literate skills for technology, apart from traditional reading, writing, and mathematics, as essential skills for the 21st century. Although a complete examination and analysis of all of these major frameworks is beyond the scope of this chapter, Dede (2010) provided a thorough comparison of these frameworks; in his thoughtful analysis, Dede concluded that there is significant overlap and consistency in the various frameworks. However, he also found that there are some differences, especially in those frameworks that are for education at all levels (from preschool through college) and those focused on business and industry. For example, business and industry frameworks include things such as students acting autonomously and student risk taking, which are not always stressed in most school curricula.

It is clear that the competencies demanded by employers and civic participation alike in the 21st century are and will be expanding to include abilities that are more interpersonal, as opposed to individual, in nature. Although individual skills such as reading, writing, computation, and information processing will be demanded at more complex levels (e.g., Carnegie Council on Advancing Adolescent Literacy, 2010), social competencies such as collaboration, adaptability, and oral communication will be increasingly required in the contexts in which those skills are applied as well (Wagner, 2008). The frameworks noted are consistent in emphasizing that ICT and technological literacy are at the core of 21st-century skills, as the rapid development of ICT requires a whole new set of competencies related to ICT. Taken as a whole, the frameworks draw on ICT demands as an argument for the need of 21st-century skills, but they also consider ICT as a tool that can support the acquisition and assessment of these skills.

**New Literacies**

In addition to the frameworks noted that focus on 21st-century skills in general, a parallel area of work has focused on the literacy aspects of 21st-century skills in the context of changing technology. Several authors argue that the Internet and all the dynamically changing uses and products are the defining technology for literacy and learning, and the backdrop for the range of 21st-century skills. As part of this change, the medium of literacy is beginning to change from the printed page to the electronic screen. Much of the thinking of the nature and implications of these changes is found in what has come to be called new literacies. However, even though there is a single label, there are many different perspectives under this umbrella, as Leu, McVerry, and colleagues (2009) have noted. These authors point out that some scholars focus on new social practices from a critical theory approach (Street, 2003), while others (Gee, 2003) focus on
new Discourses, that is, the combination of language with other social practices (behavior, values, ways of thinking, clothes, food, customs, perspectives) within a specific group. Scholars such as Kress (2003) focus on meaning making as a social practice in specific social and cultural circumstances, while others (The New London Group, 2000) focus on multiliteracies that encompass a multiplicity of communications channels and increasing cultural and linguistic diversity or on the multimodal contexts of literacy practices (Hull & Schultz, 2002). Others take a broader perspective, which incorporates several of the elements described (Lankshear & Knobel, 2006).

Leu, Kinzer, Coiro, and Cammack (2004) have focused in particular on the new literacies created as a result of the multiple communicative and interactional affordances of the Internet. They define it as follows:

The new literacies of the Internet and other information and communication technologies include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other information communication technologies (ICTs) to identify important questions, locate information, critically evaluate the usefulness of the information, synthesize the information to answer those questions, and then communicate the answers to others. (p. 1572)

In spite of the lack of consensus on the exact definition or focus of new literacies work, recent reviews (Coiro, Knobel, Lankshear, & Leu, 2008; Leu et al., 2007) have observed that most of the new literacies research is consistent in four aspects:

1. New literacies include the new skills, strategies, dispositions, and social practices that are required by new technologies for information and communication.
2. New literacies are central to full participation in a global community.
3. New literacies regularly change as their defining technologies change.
4. New literacies are multifaceted, and our understanding of them benefits from multiple points of view.

Recently, some scholars have attempted to refine the notion of new literacies by proposing a new literacies theory (Coiro et al., 2008; Leu, Kinzer, et al., 2004; Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009). These authors suggest that the Internet is not a technology issue, as it is commonly viewed, but rather a context in which literate skills are displayed and constructed. These continually developing contexts and associated activities include a range such as personal blogs, the strategic use of search engines to solve everyday problems or answer questions, e-mail, online gaming, podcasting, videocasting, photosharing, shopping, chatting, and social networking sites.
This emerging theoretical framework includes two levels: an uppercase New Literacies and a lowercase new literacies. The capitalized New Literacies encompasses the broader and more inclusive framework, which is fed by the more specific work in a narrow area. The lowercase new literacies approach is exemplified in the active work on the narrower topic of reading comprehension in online environments by Leu and collaborators (Leu et al., 2007, 2011). These authors have argued that while the reading and literacy field has continued to focus on the key dimensions of phonemic awareness, decoding (phonics), fluency, vocabulary, and comprehension, the very nature of reading itself is changing and that online and print-based comprehension is not always equivalent. Interestingly, the RAND report on reading that has been so influential in research, policy, and practice does not focus on this dimension (RAND Reading Study Group, 2002).

As one example, Leu et al. (2007) found no significant correlation, among seventh-grade students, between performance on a measure of offline reading comprehension and a measure of online reading comprehension for adolescents, using a blog to provide prompts and record responses. Coiro (2007) has found that knowing a student’s online reading ability adds significantly to predicting performance on another online reading task, over and above knowing their offline reading ability and prior knowledge of the topic. The basic argument is that these new environments demand not only extensions of existing skills but also new skills; yet, to date, it appears that little attention is given to these new skills in most classrooms or assessments (Madden, Ford, Miller, & Levy, 2005).

Coiro (2007) has found at least five different types of evaluation that occur during online reading comprehension:

1. Evaluating understanding: Does it make sense to me?
2. Evaluating relevancy: Does it meet my needs?
3. Evaluating accuracy: Can I verify it with another reliable source?
4. Evaluating reliability: Can I trust it?
5. Evaluating bias: How does the author shape it?

This list suggests that there may be only a partial overlap with traditional reading comprehension skills. Leu (2006) and Leu et al. (2011) have argued that the lack of attention to these critical skills in schools is especially problematic for those students who have the least access to the Internet or other technologies at home.

In sum, there is wide agreement that the social and economic context is rapidly changing, that some existing skills will be much more important than before, and that some new skills will receive more emphasis than in the past. The fundamental nature of the social contexts and social practices in which cognitive skills in general, but in literacy specifically, will be used will be different than in the past. Technology, especially the Internet, is a driving force and, at the same time, is itself characterized by dynamic change. It is clear that expertise in these areas will be required to assure participation in local as well as global networks and communities.
What Have We Learned From 20th-Century Literacy and the Educational Experiences and Outcomes of Students From Diverse Language and Cultural Backgrounds?

The literacy field is indeed complex. There are many different areas of focus and many different theoretical and paradigmatic approaches. Perhaps it is unrealistic to try to summarize lessons learned from the recent past related to the 20th-century literacy. However, there are some things worth noting that have a bearing on the topic of this chapter.

One important lesson has to do with the nature of the very phenomenon we study and centers on the distinction between reading and literacy. These two terms have often been used interchangeably in spite of the fact that various authors may hold very different meanings for them. An influential National Research Council report (Snow, Burns, & Griffin, 1998) defined reading as “the use of the products and principles of the writing system to get at the meaning of a written text” (p. 42). This definition reflects a perspective that focuses on the individual psychological processes involved in decoding and comprehending text. At the same time, however, other work in the field has reflected not only on these components but also more broadly on the beliefs, attitudes, and social practices that literate individuals and social groups engage in in a variety of settings and situations (P. Pearson & Raphael, 1999). This broader construct of literacy involves knowledge of the values, viewpoints, funds of knowledge (González, Moll, & Amanti, 2005), and language patterns established by members of the particular discourse group where literate practices are carried out.

While the psychological processes involved in reading (as previously defined) are most often seen as universal, literacy is often seen as much more culturally specific, opening the possibility of multiple literacies such as those discussed earlier on 21st-century skills. One of the lessons learned is that the language patterns, types and uses of text, vocabulary, syntax, and shared meanings and values in school-based literacy may be very different from those found in some home and community settings (Bloome, Katz, Solsken, Willett, & Wilson-Keenan, 2000). Some scholars have argued that whereas the cultural practices in home and community settings are normally acquired, the literate cultural practices associated with school are learned (Gee, 2000). One source of friction within the field has been that the terms reading and literacy have been used interchangeably even though they may carry very different meanings. In addition, research in one area is sometimes used to suggest pedagogy and policy in the other, a factor that may help explain some of the disagreements within the field.

Outcomes for Diverse Students

It has often been noted that students of color and students from families of low socioeconomic status generally fare less well on measures of reading and literacy, as well as in other academic outcomes (J. Lee, 2002). A recent policy document (Partnership for 21st Century Skills, 2008) notes an interesting pattern in these
gaps, namely, the existence of two distinct achievement gaps: a high/low achievement gap and a global achievement gap. The high/low gap is primarily due to systematic and long-standing differences among U.S. subgroups.

These differences cut across the important content areas of math and reading. In the 2011 National Assessment of Educational Progress (NAEP) in mathematics, 384,200 U.S. students in grades 4 (209,000) and 8 (175,200) were tested (National Center for Education Statistics, 2011a). Of the fourth graders, 52% of white students scored in the proficient or advanced performance bands. However, only 24% of Hispanic students and 17% of black students scored in these bands. For grade 8, 44% of white students scored in the proficient or advanced performance bands, whereas only 21% of Hispanic students and 14% of black students scored in these bands. In a similar vein, the scale score difference between students not eligible for free or reduced-priced lunches and those who were was 24 points for grade 4 and 29 points for grade 8 (National Center for Education Statistics, 2011a).

In the 2011 NAEP in reading, 381,300 U.S. students in grades 4 (213,100) and 8 (168,200) were tested (National Center for Education Statistics, 2011b). Of the fourth graders, 44% of white students scored in the proficient or advanced performance bands. However, only 19% of Hispanic students and 16% of black students scored in these bands. Of the eighth graders, 44% of white students scored in the proficient or advanced performance bands, whereas only 21% of Hispanic students and 14% of black students scored in these bands. For grade 8, 43% of white students scored in the proficient or advanced performance bands, whereas only 19% of Hispanic students and 15% of black students scored in these bands. In terms of socioeconomic differences, the scale score difference between students not eligible for free or reduced-priced lunches and those who were was 29 points for grade 4 and 25 points for grade 8 (National Center for Education Statistics, 2011b). Similar patterns to those described for ethnicity/race and family income levels are found for eighth graders in the area of science (National Center for Education Statistics, 2012) and for eighth and 12th graders in writing (Salahu-Din, Persky, & Miller, 2008) from the 2007 assessments.

There is also what has been termed a global gap related to comparisons between top-performing students in the United States and those in international settings. This suggests that the achievement issues just noted are more apparent with students of color but go beyond specific ethnic or racial subgroups. The main pattern is that the United States is not doing well as compared with other countries. Evidence for this is found in data from international assessments such as TIMSS (Trends in International Mathematics and Science Study), which is a periodic set of assessments in mathematics and science in four-year cycles. In the results from the 2003 administration of this measure, the United States ranked above the international average but ranked only 15th of 46 countries in grade 8 mathematics and 12th of 25 countries in grade 4 mathematics. In science, the United States ranked 9th of 45 countries at the eighth-grade level and 6th of 25
countries at the fourth-grade level (Martin, Mullis, Gonzalez, & Chrostowski, 2004; Mullis, Martin, Gonzalez, & Chrostowski, 2004).

Another international assessment is the PISA (Programme for International Student Assessment), which measures the performance of 15-year-old students in the domains of reading literacy, mathematics literacy, and science literacy on a three-year cycle. In the results of the 2009 PISA, which focused on reading more intensively than in previous administrations, U.S. students ranked 24th in reading based on distributions of students across different performance bands, and their mean score was not statistically different from that of the mean of all countries combined (OECD, 2010, p. 50). Black and Hispanic students had lower and significantly different average scores than the overall OECD and U.S. average scores. In mathematics, 31 countries had a higher mean score than the United States (OECD, 2010, p. 135), and in science, 22 countries had a significantly higher mean (OECD, 2010, p. 152).

One alarming issue is that the patterns related to achievement differences take place against a backdrop of increasing diversity and increasing economic divides. A very recent report from the Pew Research Center (Kochhar, Fry, & Taylor, 2011) indicates a staggering pattern of economic differences among groups. In 2009, the median net worth of households for whites was $113,149, whereas for Hispanics and blacks it was $6,325 and $5,677, respectively. These figures represent an astounding drop in income in a relatively short period of time, from 2005 to 2009. In that period, income for whites decreased slightly but fell almost two-thirds for Hispanics and one-half for blacks (Kochhar et al., 2011). The authors attribute this pattern to two primary factors, the economic recession and the housing downturn, which both impacted the entire country. Unsurprising, these changes would be expected to impact most heavily any group with a high percentage of their wealth in their home and groups who live in areas of the country where the housing downturn was most dramatic, which was exactly the situation for many Hispanic and black families.

**Access to and Use of Technology**

As technology and Internet use have become a more central feature of daily life, there has been a pattern of significant inequities related to access. At the conclusion of the 20th century, data suggested that Asians and Pacific Islanders had the greatest access to technology, followed by whites, then blacks, and then Hispanics (T. Pearson, 2002). Children in the poorest school districts in the United States had the least amount of Internet access at home (Cooper, 2004). In 1999, schools with high poverty and schools with high minority enrollments were generally less likely to use computers or the Internet for instruction during class time than teachers in schools with low poverty and schools with low minority enrollment (Smerdon et al., 2000). This gap existed despite the fact that nearly all public schools had access to the Internet, regardless of poverty level (Williams, 2000).

The most recent national data expands on these patterns (DeBell & Chapman, 2006; Gray, Thomas, & Lewis, 2010). Figures 1a–c suggest that school-based
Figure 1. Percentage of Children in Nursery School and Students in Grades K–12 Using Computers at Home and at School in 2003

(a) Parent educational attainment

<table>
<thead>
<tr>
<th>Attainment</th>
<th>Home</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>35</td>
<td>78</td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>84</td>
</tr>
<tr>
<td>Some college</td>
<td>72</td>
<td>86</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>82</td>
<td>84</td>
</tr>
<tr>
<td>Graduate education</td>
<td>88</td>
<td>84</td>
</tr>
</tbody>
</table>


(b) Family income

<table>
<thead>
<tr>
<th>Income</th>
<th>Home</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $20,000</td>
<td>37</td>
<td>80</td>
</tr>
<tr>
<td>$20,000–$34,999</td>
<td>55</td>
<td>81</td>
</tr>
<tr>
<td>$35,000–$49,999</td>
<td>71</td>
<td>86</td>
</tr>
<tr>
<td>$50,000–$74,999</td>
<td>80</td>
<td>84</td>
</tr>
<tr>
<td>$75,000 or more</td>
<td>88</td>
<td>86</td>
</tr>
</tbody>
</table>


(continued)
differences have largely disappeared for students but that home-based differences exist, and some of the key patterns are tied to various sociocultural variables (DeBell & Chapman, 2005, 2006). Table 1 indicates the nature of some of these patterns. One general pattern is that computer use is relatively high across all groups, whether examined by student’s grade level, gender, race/ethnicity, physical disability status, school size, parental education, household type, language, poverty status, income level, or urban/rural location. In all cases, computer usage is 80% or above, with the highest percentage characterizing 12th-grade students (97%).

There are significant differences, however, when these same categories describe Internet use. The percentage of computer users relative to Internet users is higher across all categories, but there are big differences within some of the categories. For example, 67% of whites use the Internet, whereas only 44% of Hispanics and 47% of blacks do. Also, parental education is a factor: Only 37% of students whose parent does not have a high school education use the Internet, whereas the figure is 73% if the parent has some graduate education. Some of the more striking differences are related to home language, poverty status, and family income level. The percentage of Internet users where Spanish is spoken is 28%
Table 1. Percentage of Children in Nursery School and Students in Grades K–12 Who Use Computers and the Internet, by Student and Family/Household Characteristics: 2003

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number of Students (in thousandths)</th>
<th>Percent Using Computers</th>
<th>Percent Standard Error</th>
<th>Percent Using the Internet</th>
<th>Percent Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>58,273</td>
<td>91</td>
<td>0.3</td>
<td>59</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Student Characteristic**

**Grade level**
- Nursery school: 4,928, 66%, 1.5, 23%, 1.3
- Kindergarten: 3,719, 80%, 1.4, 32%, 1.7
- 1–5: 20,043, 91%, 0.4, 50%, 0.8
- 6–8: 12,522, 95%, 0.4, 70%, 0.9
- 9–12: 17,062, 97%, 0.3, 79%, 0.7

**Sex**
- Female: 28,269, 91%, 0.4, 61%, 0.6
- Male: 30,005, 91%, 0.4, 58%, 0.6

**Race/ethnicity**
- White: 35,145, 93%, 0.3, 67%, 0.5
- Hispanic: 10,215, 85%, 1.2, 44%, 1.7
- Black: 8,875, 86%, 0.9, 47%, 1.4
- Asian: 2,293, 91%, 1.6, 58%, 2.7
- American Indian: 346, 86%, 4.8, 47%, 7.0
- More than one race: 1,400, 92%, 1.9, 65%, 3.3

**Physical disability status**
- Disabled: 646, 82%, 3.3, 49%, 4.3
- Not disabled: 47,949, 91%, 0.3, 61%, 0.5

**School enrollment**
- Public: 50,653, 91%, 0.3, 60%, 0.5
- Private: 7,620, 86%, 0.8, 54%, 1.2

**Family and Household Characteristic**

**Parent educational attainment**
- Less than high school credential: 5,691, 82%, 1.1, 37%, 1.4
- High school credential: 13,804, 89%, 0.6, 54%, 0.9
- Some college: 16,548, 93%, 0.4, 63%, 0.8
- Bachelor’s degree: 8,590, 92%, 0.6, 67%, 1.1
- Graduate education: 10,713, 95%, 0.5, 73%, 0.9

**Family/household type**
- Two-parent married household: 40,987, 92%, 0.3, 62%, 0.5
- Male householder: 3,129, 90%, 1.2, 55%, 1.9
- Female householder: 13,463, 89%, 0.6, 52%, 0.9
- Other arrangement: 694, 89%, 2.6, 55%, 4.1

(continued)
Table 1. Percentage of Children in Nursery School and Students in Grades K–12 Who Use Computers and the Internet, by Student and Family/Household Characteristics: 2003 (Continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number of Students (in thousandths)</th>
<th>Percent Using Computers</th>
<th>Percent Standard Error</th>
<th>Percent Using the Internet</th>
<th>Percent Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household language</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish-only</td>
<td>2,840</td>
<td>80</td>
<td>1.6</td>
<td>28</td>
<td>1.8</td>
</tr>
<tr>
<td>Not Spanish-only</td>
<td>55,434</td>
<td>91</td>
<td>0.3</td>
<td>61</td>
<td>0.4</td>
</tr>
<tr>
<td>Poverty status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In poverty</td>
<td>10,173</td>
<td>84</td>
<td>1.1</td>
<td>40</td>
<td>1.5</td>
</tr>
<tr>
<td>Not in poverty</td>
<td>39,016</td>
<td>93</td>
<td>0.4</td>
<td>66</td>
<td>0.7</td>
</tr>
<tr>
<td>Family income</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Under $20,000</td>
<td>8,815</td>
<td>85</td>
<td>0.8</td>
<td>41</td>
<td>1.1</td>
</tr>
<tr>
<td>$20,000–$34,999</td>
<td>9,273</td>
<td>87</td>
<td>0.7</td>
<td>50</td>
<td>1.1</td>
</tr>
<tr>
<td>$35,000–$49,999</td>
<td>7,499</td>
<td>93</td>
<td>0.7</td>
<td>62</td>
<td>1.2</td>
</tr>
<tr>
<td>$50,000–$74,999</td>
<td>9,834</td>
<td>93</td>
<td>0.5</td>
<td>66</td>
<td>1.0</td>
</tr>
<tr>
<td>$75,000 or more</td>
<td>13,769</td>
<td>95</td>
<td>0.4</td>
<td>74</td>
<td>0.8</td>
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<tr>
<td>Metropolitan status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metropolitan, central city</td>
<td>13,229</td>
<td>88</td>
<td>0.6</td>
<td>50</td>
<td>0.9</td>
</tr>
<tr>
<td>Metropolitan, not central city</td>
<td>26,670</td>
<td>92</td>
<td>0.4</td>
<td>63</td>
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<tr>
<td>Non-metropolitan</td>
<td>10,370</td>
<td>91</td>
<td>0.7</td>
<td>59</td>
<td>1.3</td>
</tr>
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</table>

Note. Detail may not sum to total because of rounding or missing data. From Computer and Internet Use by Students in 2003 (NCES 2006–065, p. 6), by M. DeBell and C. Chapman, 2006, Washington, DC. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

1White, Black, Asian, More than one race, and American Indian respectively indicate White, non-Hispanic; Black, non-Hispanic; Asian or Pacific Islander, non-Hispanic; More than one race, non-Hispanic; and American Indian, Aleut, or Eskimo, non-Hispanic. Hispanics may be of any race.

compared with 61% where Spanish is not spoken. With respect to poverty status, the figures are 66% for those students who do not live in poverty versus 40% for those who do. There are also dramatic effects associated with income level. The percentage of users is 41% for those from families with incomes under $20,000 and 75% for those from families with incomes of $75,000 and over. These differences are important because the Internet significantly extends the power of the computer to communicate and access information (DeBell & Chapman, 2005, 2006).

Outside-of-school technology use and access is complex and interesting as well. For example, type of technology is important because access to some forms of technology seems to be equalizing among different ethnic and racial groups. There are indications that the between-group differences seen in other areas seem to have dissipated when examining laptop ownership. For example, 55% of whites
own laptops, compared with 51% of blacks and 54% of Hispanics. There is also evidence that black and English-speaking Hispanics are active users of the Web for a variety of purposes through the use of cell phones. Interesting, cell phone ownership is greater for Hispanics and blacks (87% of each group) compared with whites (80%; Smith, 2010). Moreover, the first two groups use cell phones more often than whites for communicative purposes, such as sending e-mail, sending and receiving text messages or instant messages, or accessing the Web. Blacks and Hispanics also use cell phones more often than whites do for recreational or personal uses, such as playing a game, recording a video, playing music, using a social networking site, or watching a video (Smith, 2010).

These patterns have led to questions about the effects and consequences related to how the technology is used. As the previous paragraph suggests, there is some suggestion (Washington, 2011) that recreational and social use is greater among minority youths than other groups. Thus, some have pointed out that these uses of technology are not those that might further academic goals or serve to reduce academic inequities. This is no hard evidence related to the possible consequences of this pattern, but it is an issue that deserves attention. It is reasonable to expect that technology, like other cultural tools, will be actively adapted to different ecocultural niches in ways that make sense to those who occupy them. There is no guarantee that all the things that technology may afford will be appropriated in all cases.

In sum, there are reasons to be cautious about the information just presented. There is increasing diversity along several dimensions, continuing and systematic achievement differences, and a changing world context that will demand new and more complex skills. Given that achievement differences continue to exist, it is fair to say that current approaches have not been entirely successful in addressing gaps in traditional literacy skills for diverse students. What is the likelihood that new and more complex skills will be addressed in a more favorable fashion? In light of anticipated changes, there is a very real danger that students of color and from low-income families face the threat of a double deficit, with differences continuing to surface not only in traditional literacy but also in the literate skills required in the 21st-century workplace.

The Research and Policy Context

Over the last two decades, considerable resources have been expended on trying to address literacy achievement, including the Reading Excellence Act, Early Reading First, Reading First, Even Start, Reading Is Fundamental, and Striving Readers (U.S. Department of Education, 2007, 2010). Although some progress has been made, Shanahan and Shanahan (2008) have argued that the progress has been in the area of early basic literacy, which does not automatically transfer to proficiency in more specialized disciplinary literacy as one moves up the academic ladder. They have noted that context experts in math, chemistry, and history read discipline-based texts quite differently, and the researchers thus recommend different comprehension strategies. This represents a deviation from
the belief that if students are just taught to master basic strategic skills in reading, then the background knowledge that they acquire will allow them to read any type of text successfully—the so-called “vaccination” conception of teaching (Shanahan & Barr, 1995, p. 982).

Shanahan and Shanahan (2008) distinguish between basic literacy (literacy skills such as decoding and knowledge of high-frequency words that underlie virtually all reading tasks), intermediate literacy (literacy skills common to many tasks, including generic comprehension strategies, common word meanings, and basic fluency), and disciplinary literacy (literacy skills specialized to history, science, mathematics, literature, or other subject matter). Unsurprisingly, this suggests that different approaches, such as specialized texts, strategies and interpretive standards, thinking and analytical practices, and teachers’ professional development, need to be considered. When this is superimposed on the considerable demands that will be imposed on the educational system related to helping students become proficient in 21st-century skills and new literacies, the task is daunting indeed, especially regarding those students who have fared less well traditionally.

**Instructional Considerations**

Although considerable investment has been made in improving literacy instruction, as noted previously, as of yet there is little that systematically targets the instruction of specialized knowledge, such as online reading comprehension and other new skills. The problem is that research in this area is in its infancy (Leu, McVerry, et al., 2009), especially for students of color (Castek et al., 2007; Parker, 2007). These and other authors have suggested that socially mediated and inquiry-based experiences may be especially useful as instructional models are developed for teaching the new literacies of online reading comprehension (Leu, Leu, & Coiro, 2004). Unfortunately, these are the kinds of educational experiences that underachieving students have traditionally received in lesser amounts.

With respect to students who are English learners, there have been several attempts to synthesize the general findings regarding literacy instruction (August & Shanahan, 2006; Genesee, Lindholm-Leary, Saunders, & Christian, 2006; Goldenberg, 2006, 2011; Goldenberg & Coleman, 2010; Rolstad, Mahoney, & Glass, 2005; Slavin & Cheung, 2005). There is relative agreement about the generalization that teaching students to read in the primary language promotes higher levels of reading in English, but that when taught in English, students require additional supports (e.g., clarifications, explanations, instructing the strategic use of cognates to aid work-attack skills and comprehension) primarily because of low English proficiency. Although these patterns likely hold for the instruction of 21st-century skills and new literacies, the research in this area is nonexistent. An additional issue for English learners is that although additive and first-language learning approaches have been recommended by many researchers in the field, there is an increasing tendency to eliminate or reduce these types of programs in
favor of English-only and related restrictive language policies, with scarce theoretical or empirical justification (August, Goldenberg, & Rueda, 2010).

An interesting debate in the instructional literature focused on students of color is related to the question of universality of practices and approaches. That is, is good instruction universally applicable, or do certain groups of students profit from instruction tailored to meet their unique cultural frameworks and practices (Tharp, 1989)? While authorities in the 1960s and 1970s often considered student cultural and language differences as deficits, more recent work has come to view these as assets to be used in designing instruction (González et al., 2005; C. Lee, 2007), often lumped under the label of culturally responsive instruction. While a variety of intriguing approaches have been described in the literature, a recent review (August & Shanahan, 2006) has found a lack of systematic evidence, primarily because the issue has not been well studied, not because it has been systematically and extensively studied and found not to work. Rueda (2011) has discussed the cognitive and motivational considerations as they might influence future work in this area.

Rueda (2006) has noted that there have been important shifts related to how cultural issues have been treated in the literature. From the 1960s through the 1980s, as compared with the current context, for example, the consideration of culture in the research and writing in the areas of reading and literacy has changed from minimal treatment to more substantial treatment; from being viewed as a minor topic to a central topic; from a deficit to an instructional resource; from a focus on differences to a focus on access; from a focus on school primarily to a focus on school, home, and community; from a single literacy to multiple literacies; from a view of universal processes to a view of situated processes; and from a focus on cultural matching of teachers and students and increasing awareness and sensitivity to cultural modeling and other uses of funds of knowledge. Given the goals of this chapter, it is useful to think about a third column: what will it be like with 21st-century skills? How will this shift in the next few years given all the changes detailed earlier in this chapter? It will be important to devote attention to these issues from both a research and a policy perspective, as cultural factors and differences will be important mediators for the acquisition and use of 21st-century skills and new literacies.

**Accountability and Assessment**

One of the overriding factors that defines the current educational context is the press for accountability. A typical pattern is the reliance on standardized tests as the primary means of evaluating students’ literacy learning (Au, 2006; Hoffman, Assaf, & Paris, 2001). As Shepard (1990) pointed out some time ago, this policy initiative is based on a simple set of arguments. First, testing helps set goals and standards to which school districts, schools, teachers, and students can aspire. Second, test data provides feedback to modify classroom instruction. Third, testing makes all actors more accountable for student learning. Finally, testing, coupled with incentives and/or sanctions, can be used to leverage changes and
educational reform. However, one negative by-product of a test-based accountability approach is the incentive to play the system. As one example, Jacob and Levitt (2003) have found that a small number of teachers are more likely to cheat when faced with more accountability pressure.

Some research has attempted to examine the impact of accountability pressures specifically from a motivational perspective. Mintrop (2003) has found that accountability policies have only a mild influence on teacher motivation but a negative effect on their commitment. Although the threat of stigma resulted in increased work effort, they also resulted in compliance and anxiety. Leithwood, Steinbach, and Jantzi (2002) have found that misalignment of accountability policy with individual teachers’ goals, concerns about their ability to implement the policy, concerns about inadequate time and resources, and emotions, such as frustration, all lessen teachers’ motivation to implement accountability measures. The researchers have also found that accountability policies serve to challenge teachers’ sense of professionalism, and the sanction of reconstituting a school has a negative effect on teachers’ sense of self-worth.

Finnigan and Gross (2007) conducted a study in Chicago that drew explicitly from an expectancy–value motivation framework to examine whether teacher motivation levels changed as a result of accountability policies. They found that the value teachers placed on their professional status and their goals for students focused and increased their effort, but low morale had the potential to undercut the sustainability of teachers’ responses. Of importance to the students who are the focus of this chapter, at least one study found that teachers’ response to accountability policies largely depended on their beliefs about students and their own self-efficacy. Specifically, teachers did not respond to the accountability policies in ways that would lead to improved instruction and learning when they had low expectations of students’ abilities or their own self-efficacy about their ability to influence learning (Abelmann & Elmore, 1999).

Apart from the motivational considerations, do these reform efforts work? This is a controversial area, although there is little evidence that accountability-based reform has served to narrow the achievement gaps (Harris & Herrington, 2006; Nichols, Glass, & Berliner, 2006). One recent national study examined the relationship between high-stakes testing pressure and student achievement across 25 states. Each state was rated as to the degree of accountability pressure, resulting in a continuum of accountability pressure from high to low. Regression and correlation analyses found no relationship between earlier pressure and later cohort achievement for math at the fourth- and eighth-grade levels on the NAEP. Further, no relationship was found between testing pressure and reading achievement on the NAEP at any grade level or for any ethnic student subgroup. It was also found that there was suggestive evidence for a relationship between high-stakes testing pressure and subsequent achievement on the national assessment tests, but only for fourth grade, noncohort achievement, and some ethnic subgroups.
The large-scale, high-stakes tests used to support accountability have been criticized for being overly narrow in content, lacking a match with curricula and instruction, neglecting higher order thinking skills, and having limited response formats. However, Leu, O’Byrne, and colleagues (2009) have noted an additional problem, notably that current assessments do not address new competencies such as online reading comprehension. Schools, especially the lowest achieving ones, are under tremendous pressure to raise scores and often tend to respond to teaching what the tests measure in a narrow fashion, thus de-emphasizing higher order and technology-related literacy skills. Thus, schools may be replicating the oft-noted pattern that those who require the most receive the least. Whether or not assessments continue to drive curricula in this way, there needs to be consideration given to a closer link to the changing nature of real-world and workplace skills and the content and formats of assessments.

**The Role of Teachers**

The key role of teachers in the implementation of curricular innovations has been increasingly and widely acknowledged (Lieberman & Mace, 2008). It is not only teachers’ pedagogical and content knowledge that is important, but also their attitudes, beliefs, and motivational orientations are critical in the realization of effective teaching and learning environments. The negative impact of low expectations and excessive focus on real or assumed student, family, and community deficits has been well documented (Valencia, 2010).

Teachers’ roles in mediating students’ use of technology is an important consideration. Gray and colleagues (2010) indicate that technology is found in virtually every school in the country, but there are some interesting findings regarding how teachers use it and how these uses vary by student characteristics. For example, comparing high- and low-poverty schools, the percentage of teachers who reported that their students used educational technology sometimes or often during classes to prepare written text was 66% and 56%, respectively. In addition, there were differences related to poverty in terms of using technology to learn or practice basic skills (61% and 83%, respectively) and to develop and present multimedia presentations (47% and 36%, respectively). Other teacher differences between these types of schools (high poverty vs. low poverty) include the percentage of teachers who sometimes or often did the following: used e-mail or a listserv to send group updates or information to parents (69% vs. 39%) or to students (30% vs. 17%), used e-mail to address individual concerns with parents (92% vs. 48%) or with students (38% vs. 19%), or used a course or teacher webpage to communicate with parents (47% vs. 30%) or with students (36% vs. 18%).

Interesting, not all teachers report optimal support. The percentage of teachers who reported that the following activities prepared them (to a moderate or major extent) to make effective use of educational technology for instruction are 61% for professional development activities, 61% for training provided by school staff responsible for technology support and/or integration, and 78% for independent
learning. These numbers leave a wide gap from the numbers of teachers who reported not being prepared.

In terms of teacher preparation, one challenge will be to meet 21st-century educational demands with an adequate supply of qualified teachers in the face of an increasingly diverse student population and a teacher workforce that is currently more than four-fifths non-Hispanic white (Aud et al., 2011). Whereas the demographics of the student population are rapidly changing, the demographics of the teaching force are much more stable. In the case of English learners, most teachers have not been adequately trained to deal with language differences. As of 2000, for example, 41% of U.S. teachers had taught English learner students, but only 13% had received any type of specialized training (Gruber, Wiley, Broughman, Strizek, & Burian-Fitzgerald, 2002). A recent survey of 5,300 teachers in California indicated that many respondents felt unprepared to meet the challenge of teaching English learners, even when they had specialized training (Gándara, Maxwell-Jolly, & Driscoll, 2005). This does not mean that simple linguistic or ethnic/racial matching is a useful approach, as there is little evidence for this strategy with respect to student outcomes. However, it does mean that attention will need to be directed at assisting teachers in understanding how individual and interpersonal competencies are nurtured in and outside of school for students whose families are culturally (and often linguistically) different from the teachers’ (Garcia, Jensen, & Cuéllar, 2006). Part of this means engineering ways to leverage the interpersonal assets found in the homes and communities of diverse students for instructional purposes (e.g., Fuller & Coll, 2010).

If it is the case that teachers are entering urban school settings with increasingly complex demands and increasingly diverse student populations, those institutions charged with preparing or advocating for teachers need to reconceptualize the roles that they play and the manner in which they provide preparation. It is not a secret that education in general, and universities’ schools of education in particular, are under attack from a variety of sources. One government report portrays teacher certification requirements as a “broken system” and urges that attendance at schools of education, course work in education, and student teaching become “optional” (U.S. Department of Education, 2002, p. 19). Darling-Hammond and Sykes (2003) and Darling Hammond and Baratz-Snowden (2005) have reviewed significant evidence related to the importance of teachers in student outcomes, and how teacher preparation is complicated by unequal distribution of resources to schools, lack of support systems, inadequate compensation, and lack of coordinated state and national policies aimed at producing highly qualified teachers. Unfortunately, this set of conditions impacts most strongly those schools that are in the most needy circumstances and those with the most diverse populations, and the changing context described in this chapter makes the task that much more difficult. If preparation programs are having difficulty with addressing current needs, the new strategies, resources, and priorities will need to be leveraged to keep the United States competitive.
Motivational Considerations

In a comprehensive review of current work and issues in motivation, Pintrich (2003) outlines key motivational generalizations based on current research and theory:

- Adaptive self-efficacy and competence beliefs motivate students.
- Adaptive attributions and control beliefs motivate students.
- Higher levels of interest and intrinsic motivation motivates students.
- Higher levels of value motivate students.
- Goals motivate and direct students. (p. 672)

How will these affective dimensions play out for teachers and students from diverse backgrounds as they confront the teaching and learning of new skills and abilities surrounding 21st-century skills? In the past, work on learning and motivation has been seen as separate research areas, but more and more they are being seen as part of an integrated whole, and hot cognition has replaced the view of thinking as a cold, unfeeling set of mental processes.

When one considers that active choice, persistence, and effort are key indicators of motivation (Schunk, Pintrich, & Meece, 2008), it is striking to consider the multitude of educational issues that fall within this scope in urban schools. On the part of students, consider the issues of dropout rates, low levels of engagement, failure to complete assignments, choosing the wrong peer group, lack of clear goals, low interest, and so forth. Additionally, for teachers in urban schools, consider the low rates of persistence in the profession, burnout rates, and other concerns. What will be needed to engage an increasingly diverse group of students in mastering new and more complex sets of skills than had been required in the past?

Although the research is not yet well developed, as noted earlier, it has been hypothesized that culturally compatible instruction and culturally responsive learning environments and materials can have a significant impact on key motivational variables and thus mediate student participation in ways that help (or hinder) their reading and comprehension and ultimately achievement. Certainly, much of the descriptive research on cultural factors describes increased student engagement as a product of culturally compatible teaching (Au & Mason, 1981; Goldenberg, Rueda, & August, 2006). Although engagement is not necessarily the same as achievement, fostering engagement is not a trivial concern. There is, in fact, a robust literature from a reading engagement perspective (Guthrie & Wigfield, 2000) that has explored the motivational dimensions of reading and demonstrated the connection between reading engagement and reading outcomes. It is well established that mental effort is associated with motivational beliefs such as interest (Salomon, 1984) and that academic engagement and other achievement-related behaviors are associated with measured achievement (Fredricks, Blumenfeld, & Paris, 2004) and reading comprehension in particular (Guthrie et al., 2004, 2006).
Will teachers be motivated to incorporate new content and teaching methodologies? Again, motivational issues will be important. For example, just because teachers have access to technology, that doesn’t mean they will use it. This may be mediated by the fact that not all teachers, even if motivated to use new technologies and engage students with new literacies, have the training or support to do so, as noted earlier. From the perspective of students, there are interesting motivational questions also. How well do the existing reading engagement models fit the new learning environments, content, and contexts for application that will continue to evolve? Clearly, these are issues that the field will need to tackle in the very near future.

Conclusion
The consideration of 21st-century skills in the context of reading and literacy provides an interesting challenge to the field by presenting some interesting paradoxes:

• The most rapidly increasing groups are those who are least likely to get the educational experiences that prepare them for future challenges.

• Although literacy is often included in the discussion regarding future educational considerations, it is often framed narrowly around technological literacy, at the risk of downplaying broader considerations related to literacy education and a wide range of literate cultural practices.

• In an increasingly global context, the ability to speak and write and read in more than one language will be increasingly important, yet the current trend in many schools across the country is to promote restrictive language and immigration practices and policies, including English-only approaches.

• Motivation (for students and teachers) is rarely emphasized in conversations around 21st-century skills, although it is critical for learning in general and for literacy specifically and may be especially important for the outcomes of the groups who are the focus of this chapter.

It is useful at this point in the discussion to return to an issue raised early on, namely, the question about who should decide what schools should produce. Whereas during earlier times that decision was left to educational professionals, the range of constituents has broadened significantly to include parents, community members, taxpayers, advocacy groups, and others. More than ever before, a corporate and business perspective is exerting influence on educational priorities, and a workable balance will need to be fashioned. Drawing on a game-like metaphor, not only have the players changed, but the rules of the game and the goals have changed as well. It is a unique opportunity and challenge for the field.
QUESTIONS FOR REFLECTION

1. Rueda brings up an ongoing debate about the purposes of education and the control of curriculum. Where do you weigh in on this debate?
2. What kinds of assessments might be used to determine a student’s online reading ability as described by the author?
3. What can schools of education do to prepare teachers to work with linguistically and culturally diverse student populations?

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