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WICS: A New Model for Cognitive Education

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This article presents a unified model for cognitive education, WICS, which is an acronym for *w*isdom, *i*ntelligence, *c*reativity, *s*ynthesized. The model can be applied to identification/admissions, instruction, and assessment. I first discuss why there is a need for such a model. Then I describe the model. Next I show how the model can be applied to admissions/identification. Then I show how the model can be applied to instruction and assessment. Finally, I present some conclusions.

Keywords: creativity; intelligence; wisdom; admissions; identification; instruction

"Now, what I want is Facts. Teach these boys and girls nothing but facts. Facts alone are wanted in life ... . You can only form the minds of reasoning animals upon Facts ... Stick to Facts, sir!"

(Dickens, 1854/2007)

These words made perfect sense to their originator, Thomas Gradgrind, an unimaginative school master, and Mr. McChoakumchild, his hired teacher, in Charles Dickens' 1854 novel *Hard Times for these Times*; but the whole of Dickens' novel was devoted to proving Gradgrind fatefully wrong. Even in the mid-19th century, literate people like Dickens recognized facts are not enough. It is depressing to discover in 2009 many of the same ideas coming from educational theorists (e.g., Ravitch, 2009).

The "facts only" canard is based on the correct presupposition that "one cannot think critically without quite a lot of knowledge to think about," as Ravitch (2009) puts it (p. A15). But the "Gradgrinders" (i.e., those who believe, like Thomas Gradgrind, that the purpose of schooling is to memorize facts) then move on to setting up a straw man, which Ravitch does when she curiously notes that "knowledge-free education has never worked." This is true, but no one has ever advocated "knowledge-free education" and no one ever will, because it is an oxymoron. Given that no school in the world teaches this way, it is not clear why some educators continue to bring it up, other than for rhetorical points. The maligned construct, "critical thinking," is exactly what prevents us from creating such straw men.

The failure of the "knowledge-only" approach is shown by people with encyclopedic knowledge bases whose main claim to fame is winning Trivial Pursuit or television quiz games. It

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is harmless when they win such games, but harmful when schools or educational theorists point to walking encyclopedias as exemplars of the best our education system can produce.

We have had many leaders in the United States (and elsewhere) who were educated at great places—Robert McNamara, architect of the Vietnam War, was a Berkeley and Harvard man; Donald Rumsfeld, initial architect of the Iraq War, was a Princeton man. George W. Bush, by the way, went to Yale and Harvard. Many of the architects of the financial disaster of 2008 were recruited from the best business schools in the United States. Richard Fuld, former chief executive officer (CEO) of the failed Lehman Brothers, did his MBA at NYU. Indeed, the firms that were largely behind the collapse of the financial markets in 2008 recruited only from the best schools, where students presumably learned lots of facts.

At the same time, of course, many of the people who went to the top schools have been very successful in their careers and have made a positive difference to the world. And good universities certainly do not teach students merely to memorize facts. The only point here is that great schooling does not ensure, by any means, wise or ethical use of the knowledge gained.

Certainly there is more to learning and cognitive education than memorization of facts. But what more? This article addresses that question.

THE WISDOM-INTELLIGENCE-CREATIVITY-SYNTHESIZED (WICS) MODEL

The overall model proposed here is called WICS, which is an acronym for *w*isdom, *i*ntelligence, *c*reativity, *s*ynthesized. The model draws upon and is largely consistent with the ideas of John Dewey (1997). The basic idea is that citizens of the world need creativity to form a vision of where they want to go and to cope with change in the environment, analytical intelligence to ascertain whether their creative ideas are good ones, practical intelligence to implement their ideas and to persuade others of the value of these ideas, and wisdom in order to ensure that the ideas will help achieve some ethically based common good, over the long and short terms, rather than just what is good for them and their families or friends. The different elements of the model work together and can mutually support each other. That is why the acronym ends with the "s" for "synthesized": The most successful thinkers will synthesize these various elements into a coherent and unified stream of thought.

The WICS model differs from the traditional model, which emphasizes primarily memory and analytical skills. Traditional methods of teaching as well as conventional ability and achievement tests tend to emphasize stored knowledge of facts and basic skills in analyzing this information (Sternberg, 1997). Such knowledge and skills are important. For example, one cannot think creatively to go beyond what is known if one does not have the knowledge to move forward. Similarly, one cannot apply what one knows if one knows nothing. But the problem is that stored knowledge can be inert and essentially unusable. Analytical skills can help one evaluate existing ideas but cannot help one come up with ideas of one's own. Nor can they help one adjust to a world that is changing rapidly and that leaves behind people who cannot flexibly adapt to its shifting demands.

The risk of the traditional system is that it creates self-fulfilling prophecies whereby those who do not test well are not given full opportunities in college to succeed (Sternberg, 1997). WICS is a framework that can help us get beyond self-fulfilling prophecies, in admissions, instruction, and assessment (Sternberg, 2003).

In the WICS model, analytical intelligence as exemplified in critical thinking *is* important, contrary to what Ravitch (2009) and other Gradgrinders have argued: It is what enables people to distinguish decent politicians from demagogues and healthful foods from widely advertised junk foods. Also important is creativity—the ability to respond flexibly to rapidly changing situations and world events—and practical intelligence—the ability actually to apply what you learn in school to real life. Creativity is needed to find ways to solve new problems, such as how to live on a greatly reduced income. Lack of such thinking leads people to get stuck in entrenched ideas that no longer work. Practical intelligence represents the difference between getting 100% on the written drivers' test and being able to drive, or the difference between knowing you should not drink and drive, and actually acting on this knowledge. Most important of all is wise and ethical thinking—putting what you learn to good use that helps build a better world rather than destroy it. Originally, for example, many thought that terrorists who intentionally attack innocent people, including innocent women and children, were poorly educated and ignorant. It then turned out that many of them are quite well educated. They lack not facts, but wisdom and positive ethics. Knowledge is necessary but not sufficient for critical, creative, practical, and wise thinking. If all schools do is "stick to facts," they will poorly serve not only our children, but a world many of whose inhabitants are lacking not so much in knowledge as in how to employ it for good ends.

The skills people need to succeed in real-world careers do not always closely resemble the skills needed to succeed in elementary, secondary, and even tertiary schools. Life rarely presents multiple-choice or short-answer problems. It presents challenges to which the full WICS model is relevant. In our own work, we have applied the WICS model to admissions, instruction, and assessment (see, e.g., Sternberg, Grigorenko, & Zhang, 2008; Sternberg & the Rainbow Project Collaborators, 2006; Sternberg, Torff, & Grigorenko, 1998). In this essay, I discuss how we have done so.

WICS (Sternberg, 2003) is sometimes referred to as the "augmented theory of successful intelligence" because it expands upon a previous framework proposed in that earlier theory (Sternberg, 1997). The earlier theory spoke of the importance of analytical, creative, and practical intelligence for attainment of life goals. WICS adds wisdom in the recognition that life goals should further not only one's personal agenda, but also an agenda that balances one's own needs with those of others and society in order to achieve some kind of common good. Because wisdom was added later, earlier studies do not include measured wisdom as a dependent variable, whereas later ones do.

IDENTIFICATION AND ADMISSIONS THROUGH WICS

Is it possible that many students who are not now being identified as having impressive credentials for gifted programs, or for college or graduate work, might in fact be so identified if they were assessed in a way that looked at creative and practical, as well as analytical forms of skills? The Rainbow Project sought to answer this question with regard to university admissions at the undergraduate level (Sternberg, 2006; Sternberg & the Rainbow Project Collaborators, 2006). The project was a collaboration among 13 colleges and universities as well as 2 high schools. The project utilized the creativity and intelligence aspects of the WICS model. Because it was initiated prior to the development of WICS and was based on the earlier theory of successful intelligence (Sternberg, 1997), wisdom was not assessed.

The Rainbow measures supplement the SAT Reasoning Test, which is widely used in the United States for undergraduate admissions. These tests typically correlate about .5 with

first-year undergraduate grade-point average (GPA). The SAT Reasoning Test measures reading, mathematical, and writing skills. At the time we did this study, the writing component had not been added. A wide variety of studies have shown the utility of the SAT as a predictor of college success (e.g., Hezlett et al., 2001; Kobrin, Camara, & Milewski, 2002; Schmidt & Hunter, 1998), especially as measured by GPA (grade-point average).

In the Rainbow Project, data were collected at 15 schools across the United States, including 8 four-year colleges, 5 community colleges, and 2 high schools.

Participants were 1,013 students predominantly in their first year of college or their final year of high school. In this article, I discuss analyses only for college students because they were the only ones for whom we had available college performance. The final number of participants included in these analyses was 793.

Baseline measures of standardized test scores and high-school grade-point average were collected to evaluate the predictive validity of current tools used for college admission criteria, and to provide a contrast for our current measures. All materials were administered either in paper-and-pencil format or on the computer via the World Wide Web.

The measures of analytical skills were provided by the SAT plus analytical items we invented. One assessment was figuring out meanings of neologisms (artificial words) from natural contexts. Students see a novel word embedded in a paragraph, and have to infer its meaning from the context. In other assessments, students completed series of numbers and figural matrices.

We measured creative skills by multiple-choice but also open-ended measures. One open-ended measure required writing two short stories with a selection from among unusual titles, such as "The Octopus's Sneakers"; another one required orally telling two stories based upon choices of picture collages; and a third required captioning cartoons from among various options.

Practical skills were measured by multiple-choice items but also performance-based measures called situational-judgment inventories. One assessment presented movies showing everyday situations that confront college students, such as asking for a letter of recommendation from a professor who shows, through nonverbal cues, that he does not recognize you very well, or figuring out what to do after eating a meal but not having the money to pay for it. A "common sense questionnaire" provided everyday business problems, such as being assigned to work with a coworker whom one cannot stand, and a college life questionnaire provided everyday college situations for which a solution was required (Hedlund et al., 2003; Hedlund, Wilt, Nebel, Ashford, & Sternberg, 2006; Sternberg et al., 2000).

Factor analysis revealed three factors. One factor showed high loadings by tests that were performance-based measures of creative skills. Another factor showed high loadings by performance-based measures of practical skills. The third factor—expected to be analytical—comprised all of the multiple-choice tests. In other words, the multiple-choice tests, regardless of what they were supposed to measure, all loaded highly on a single (*g*-like) analytical factor. Multiple-choice items thus proved inadequate for distinctively measuring creative and practical skills.

The Rainbow Assessments doubled prediction of freshman-year academic success over SAT scores alone. If SATs were combined with high school GPA, the Rainbow Assessments still increased prediction by 50%. In other words, the new assessments provided very substantial gains over traditional measures. We believe that there are good reasons for these increases in prediction. One is that in the university, the student adopts to a novel environment relative to what he or she is used to, and needs flexibly to adjust to the expectations of that new environment (a creative skill). Another reason is that a major part of the freshman

(first) year in college is figuring out how to study at the college level, and in particular, how to study for different kinds of assessment (a practical skill). Still another major part of the first year is figuring out what professors expect for papers and exams (also practical).

Although one important goal of the present study was to predict success in college, another important goal involved developing measures that reduce racial and ethnic group differences in mean levels. We found that our assessments reduced race and ethnicity differences relative to traditional assessments of abilities like the SAT. Although the group differences are not perfectly reduced, these findings suggested that measures can be designed that reduce ethnic and racial group differences on standardized tests, particularly for historically disadvantaged groups like black and Latino students. These findings may have implications for reducing adverse impact in college admissions.

In 2005, I moved from Yale University, where I was IBM Professor of Psychology and Education and the lead collaborator in the Rainbow Project, to Tufts University, where I became Dean of the School of Arts and Sciences. Tufts University has strongly emphasized the role of active citizenship in education. So it seemed like an ideal setting to put into practice some of the ideas from the Rainbow Project. In collaboration with Dean of Admissions Lee Coffin, we instituted Project Kaleidoscope, which represents an implementation of the ideas of Rainbow, but goes beyond that project to include in its assessment the construct of wisdom (Sternberg, 2007, in press-a, in press-b).

We placed on the application for all of the over 15,000 students applying each year to Arts, Sciences, and Engineering at Tufts questions designed to assess WICS (Sternberg & Coffin, in press). The questions were optional. Whereas the Rainbow Project was done as a separate high-stakes test administered with a proctor, the Kaleidoscope Project was done as a section of the Tufts-specific part of the university undergraduate application. It just was not practical to administer a separate high-stakes test such as the Rainbow Assessment for admission to one university (Tufts). Moreover, the advantage of Kaleidoscope is that it got us away from the high-stakes testing situation in which students must answer complex questions in very short amounts of time under incredible pressure. As examples, a creative question asked students to write stories with titles such as "The End of MTV" or "Confessions of a Middle-School Bully." Another creative question asked students what the world would be like if some historical event had come out differently, for example, if Rosa Parks had given up her seat on the bus. Yet another creative question, a nonverbal one, gave students an opportunity to design a new product or an advertisement for a new product. A practical question queried how students had persuaded friends of an unpopular idea they held. A wisdom question asked students how a passion they had could be applied toward a common good.

In the first year, slightly more than half of applicants completed the Kaleidoscope questions. In subsequent years, the proportion has hovered around two-thirds. Simply answering the questions has been found to improve probability of admission only slightly (by about .01), but getting a top score (A+ or A) on Kaleidoscope is substantially correlated with admission.

The early results at Tufts illustrate that a highly selective college can introduce an "unconventional" exercise into its undergraduate admissions process without disrupting the quality of the entering class. It is important to underscore the point that academic achievement has always been and remains the most important dimension of Tufts' undergraduate admission process. Since we introduced the Kaleidoscope pilot in 2006, applications have remained roughly steady or increased slightly—to record levels—and the mean SAT scores of accepted and enrolling students have increased to new highs as well. In addition, we have not detected statistically meaningful ethnic group differences on the Kaleidoscope measures. Controlling

for the academic rating given to applicants by admissions officers (which combines information from the transcript and standardized tests), students rated for Kaleidoscope achieved (statistically) significantly higher academic averages in their undergraduate work than students who were not so rated by the admissions staff. In addition, research found that students with higher Kaleidoscope ratings were more involved in, and reported getting more out of, extracurricular, active-citizenship, and leadership activities in the first year at Tufts.

The positive effects of Kaleidoscope on the University's undergraduate applicant pool and enrolled class cannot—and should not—be disentangled from the effects of other initiatives, especially increased undergraduate financial aid—which at Tufts is always need-based. Initiatives like Kaleidoscope can help identify an able, diverse group of students but, without adequate financial aid and university commitment, the effects of the program will not be fully shown in actual matriculation figures.

We found that Kaleidoscope scores correlate only minimally (.1 or less) with the SAT. At the same time, the kinds of ethnic differences encountered on the SAT and even the Rainbow assessments disappeared. Overall, the assessment provided a way of predicting leadership involvement, independently of ethnic group, and without any sacrifice in academic skills.

Such projects can be done at the graduate level as well. We designed an admissions test for a large and highly rated business school in the Midwest. We showed that we could increase prediction and decrease both sex and ethnic-group differences in admissions (Hedlund et al., 2006). In the case of the measure we tested out at this business school, we also found that whereas our measure predicted performance on an independent project that was a major part of the business-school curriculum, the GMAT did not.

These kinds of assessments can also be applied for measuring achievement as well as abilities (Stemler et al., 2006, 2009). Stemler, Grigorenko, Jarvin, and Sternberg (2006) have found that including creative and practical items in augmented psychology and statistics Advanced Placement Examinations can reduce ethnic-group differences on the tests. Such examinations are generally taken by high school students who are identified as sufficiently gifted to take college-level courses. My colleagues and I modified Advanced Placement tests in Psychology and Statistics additionally to assess analytical, creative, and practical skills. Here is an example in psychology:

A variety of explanations have been proposed to account for why people sleep.

1. Describe the Restorative Theory of sleep (*memory*).
2. An alternative theory is an evolutionary theory of sleep, sometimes referred to as the "Preservation and Protection" theory. Describe this theory and compare and contrast it with the Restorative Theory. State what you see as the two strong points and two weak points of this theory compared to the Restorative Theory (*analytical*).
3. How might you design an experiment to test the Restorative Theory of sleep? Briefly describe the experiment, including the participants, materials, procedures, and design (*creative*).
4. A friend informs you that she is having trouble sleeping. Based on your knowledge of sleep, what kinds of helpful (and health-promoting) suggestions might you give her to help her fall asleep at night (*practical*)?

My colleagues and I found that by asking such questions, as in the other studies, we were able both to increase the range of skills we tested and substantially to reduce ethnic-group differences in test scores. Thus, it is possible to reduce group differences, not only in tests of

aptitudes, but also in tests of achievement. Recently, we have found very similar results for AP Physics as those we found for AP Psychology and Statistics (Stemler, Sternberg, Grigorenko, Jarvin, & Sharpes, 2009).

The assessment projects I describe above are for college students. However, we have applied similar techniques at other levels. One battery, Aurora, is used for identification of gifted children of roughly ages 10–12 (Chart, Grigorenko, & Sternberg, 2008). It assesses analytical, creative, and practical skills in the verbal, quantitative, and figural domains. It also contains a teacher and parent assessment of the children. Another battery that we devised for admissions purposes at a private school in the United States, Choate Rosemary Hall, can be used for selection of students for private secondary-school admissions (Grigorenko et al., 2009). So the general ideas described here can be applied at any level of education from the primary grades upward.

One might wonder how one assesses answers to questions that seem so subjective. The assessment is through well-developed rubrics. For example, we assess analytical responses on the basis of the extent to which they are (a) analytically sound, (b) balanced, (c) logical, and (d) organized. We assess creative responses on the basis of how (a) original and (b) compelling they are, as well as on the basis of their (c) appropriateness to the task with which the students were presented. We assess practical responses on the basis of how feasible they are with respect to (a) time, (b) place, (c) human, (d) material resources, and (e) how persuasive they are. We assess wisdom-based responses on the extent to which they (a) promote a common good, by (b) balancing one's own interests with others' interests and with larger interests, (c) over the long and short terms, through (d) the infusion of positive (prosocial) ethical values.

TEACHING AND ASSESSING FOR WICS

Can we teach for WICS—the kinds of skills and attitudes that really matters in life and in jobs? There are many techniques that can be used to teach for WICS (Sternberg & Grigorenko, 2007; Sternberg, Jarvin, & Grigorenko, 2009). These techniques can be used in any subject-matter area and at any level.

Teaching analytically means encouraging students to (a) *analyze*, (b) *critique*, (c) *judge*, (d) *compare and contrast*, (e) *evaluate*, and (f) *assess*. When teachers refer to teaching for "critical thinking," they typically mean teaching for analytical thinking. How does such teaching translate into instructional and assessment activities? Consider various examples across the school curriculum:

(a) *Analyze* the development of the character of Heathcliff in *Wuthering Heights [Literature]*. (b) *Critique* the design of the experiment (just gone over in class or in a reading) showing that certain plants grew better in dim light than in bright sunlight *[Biology]*. (c) *Judge* the artistic merits of Roy Lichtenstein's "comic-book art," discussing its strengths as well as its weaknesses as fine art *[Art]*. (d) *Compare and contrast* the respective natures of the American Revolution and the French Revolution, pointing out ways both in which they were similar and those in which they were different *[History]*. (e) *Evaluate* the validity of the following solution to a mathematical problem, and discuss weaknesses in the solution, if there are any *[Mathematics]*. (f) *Assess* the strategy used by the winning player in the tennis match you just observed, stating what techniques she used in order to defeat her opponent *[Physical Education]*.

(1) Teaching creatively means encouraging students to (a) *create*, (b) *invent*, (c) *discover*, (d) *imagine if...*, (e) *suppose that...*, and (f) *predict*. Teaching for creativity requires teachers not only to support and encourage creativity, but also to role-model it and to reward it when it is

displayed (Sternberg & Lubart, 1995; Sternberg & Williams, 1996). In other words, teachers need not only to talk the talk, but also to walk the walk. Consider some examples of instructional or assessment activities that encourage students to think creatively.

(a) *Create* an alternative ending to the short story you just read that represents a different way things might have gone for the main characters in the story *[Literature]*.

(b) *Invent* a dialogue between an American tourist in Paris and a French man he encounters on the street from whom he is asking directions on how to get to the Rue Pigalle *[French]*.

(c) *Discover* the fundamental physical principle that underlies all of the following problems, each of which differs from the others in the "surface structure" of the problem but not in its "deep structure …." *[Physics]* (d) *Imagine* if the government of China keeps evolving over the course of the next 20 years in much the same way it has been evolving. What do you believe the government of China will be like in 20 years? *[Government/Political Science]* (e) *Suppose* that you were to design one additional instrument to be played in a symphony orchestra for future compositions. What might that instrument be like, and why? *[Music]* (f) *Predict* changes that are likely to occur in the vocabulary or grammar of spoken Spanish in the border areas of the Rio Grande over the next 100 years as a result of continuous interactions between Spanish and English speakers *[Linguistics]*.

(2) Teaching practically means encouraging students to (a) *apply*, (b) *use*, (c) *put into practice*, (d) *implement*, (e) *employ*, and (f) *render practical* what they know. Such teaching must relate to the real practical needs of the students, not just to what would be practical for individuals other than the students (Sternberg et al., 2000). Consider some examples: (a) *Apply* the formula for computing compound interest to a problem people are likely to face when planning for retirement *[Economics, Math]*. (b) *Use* your knowledge of German to greet a new acquaintance in Berlin *[German]*. (c) *Put into practice* what you have learned from teamwork in football to making a classroom team project succeed *[Physical Education]*. (d) *Implement* a business plan you have written in a simulated business environment *[Business]*. (e) *Employ* the formula for distance, rate, and time to compute a distance *[Math]*. (f) *Render practical* a proposed design for a new building that will not work in the aesthetic context of the surrounding buildings, all of which are at least 100 years old *[Architecture]*.

(3) Teaching for wisdom means encouraging students to (a) *try to find a common good*, (b) *see things from others' points of view as well as your own*, (c) *balance your own interests with those of others and of institutions*, (d) *look at the long term as well as the short term*, (e) *ask how you can infuse positive ethical values into your decision making*, and (f) *realize that in real life, what is effective and often even true or perceived to be true varies over time and place* (Sternberg, 2001). Examples would be (a) What might be a just solution for the common good in the Israeli-Palestinian conflict? *[Political Science]?* (b) Did Native Americans view settlers who came West as settlers or as invaders, and why? *[History]* (c) Should Wall Street traders get bonuses if they have lost money for their clients? *[Economics]* (d) How is global warming going to affect life on Earth in the long-term? *[Geology, Climatology]* (e) Is it ever ethical to bomb enemy territories where civilians live? *[Philosophy]* (f) How does what works in an intimate relationship change over time? *[Psychology]*

It is important to teach for wisdom, because smart but foolish people are susceptible to one or more of six fallacies (Sternberg, 2005): (a) *Unrealistic optimism:* They believe they are so smart that whatever they do will work out just fine, regardless of whether it really makes sense. (b) *Egocentrism:* They start to view decisions only in terms of how the decisions benefit them. (c) *Omniscience:* They think they are all-knowing; they do not know what they do not know. (d) *Omnipotence:* They think they can do whatever they want. (e) *Invulnerability:* They

think they are so smart they can get away with anything they do. (f) *Ethical disengagement:* They believe that ethical behavior is important for others but not for themselves.

Our view that we might have success in teaching in these ways dates back at least to a study in which my collaborators and I gave a test that we had devised to over 300 high school students across the United States in order to select students on the basis of analytical, creative, and practical abilities (Sternberg, Grigorenko, Ferrari, & Clinkenbeard, 1999). The identification was prior to their being placed into sections to take a college-level summer psychology course. When we divided the students into such groups, we noticed something that, at the time, was unexpected. Students in the high-analytical group, who excelled in the abilities measured by conventional tests, were for the most part white and middle-class (see also Ceci, 1996; Greenfield, 1997; Heath, 2006). Many had been previously identified as gifted for other programs. Students in the high creative and high practical group were ethnically diverse and many had never before been identified as gifted.

The question, of course, is whether those identified as strong in the alternative ways (i.e., creatively or practically) actually performed at high levels. The answer was clear. When students were taught in a way that matched their patterns of abilities, at least some of the time, they excelled. In other words, the creatively and practically oriented students did excel, so long as the way they were taught matched, at least some of the time, the way they learned. Good teachers use a variety of teaching methods to reach diverse learning styles of their students, so any student taught in a way that is responsive to his or her pattern of abilities can excel.

What effects does teaching for WICS have on achievement? After this study, my colleagues and I went on to show that teaching to diverse styles of learning—memory, analytical, creative, practical, wisdom-based—does indeed improve achievement relative to teaching that emphasizes just traditional memory-analytical patterns of learning and thinking (Grigorenko, Jarvin, & Sternberg, 2002; Sternberg et al., 2008; Sternberg et al., 1998).

I teach for WICS in a course in the Psychology Department at Tufts University. The idea is that if we select students for WICS, we should teach according to WICS as well so that how students are taught matches how they are selected. The course is open to undergraduates at all levels in all fields of specialization, and has no prerequisites. The course, on leadership, involves a textbook on theories and research on leadership, but also a book of case studies of leadership, and two books by leadership theorists on their own views on leadership. Consider as well four additional features of the course.

First, in every class except the first and the last, a leader comes and speaks to students for about 15 min on his or her leadership experiences. The leaders come from all domains of life, including politics, finance, management, the arts, sports, religion, and the like. An additional 45 min is then spent in the class asking questions of and having a discussion with the leader. Students' interactions with the leaders give them a chance to develop and also to challenge their own beliefs about leadership.

Second, every class except the last involves an active-leadership exercise. For example, in the first class, a shill (confederate) joined the students and pretended to be one of them. After I went through the syllabus, the shill challenged it and complained that it was inadequate in a variety of ways. Students were amazed at the shill's audacity. When he was done with his complaints, I thanked him, and then noted to the class that every leader, sooner or later, confronts public challenges to his or her authority. The question is not whether it will or will not happen—it will—but rather, how the leader handles such challenges. Students divided themselves into three groups and then simulated how they would handle public challenges.

In another class, students had to "hire a dean." They divided themselves into three groups. One simulated the formation of a vision statement, the second simulated a job interview, and the third simulated a persuasion interview to entice the selected candidate to come. In yet another class, students simulated how they would deal with an incompetent team member, and in another, each of three groups formulated a proposal to improve the university; they then had to persuade the class, acting as funders, to fund their project.

Third, students had to do both individual and group projects. The individual projects involved their applying leadership concepts to their own leadership and the leadership of others, whom they interviewed. The group project involved their applying principles from the course to analyzing the leadership of a major known leader. Some of their choices were Bill Clinton, former president of the United States; Bill Gates, former CEO of Microsoft; and Kenneth Lay, former CEO of the now-defunct and failed energy company, Enron.

Fourth, exams emphasized using what one had learned. The final examination, for example, involved the story of a leader from the time she first took a leadership job until the time she was considering leaving it. The students had to analyze her leadership performance at every step along the way.

In sum, teaching for WICS seems to improve school achievement at a variety of levels and in a variety of subject-matter areas. This improvement seems to occur regardless of the way in which achievement is measured, because teaching for WICS enables students to capitalize on strengths and to compensate for or correct weaknesses.

CONCLUSION

WICS is of course not the only model that can be applied to identification/admissions, instruction, and assessment. Gardner (1983, 1993, 1999) has presented a well-known model of multiple intelligences that is appealing, although perhaps in need of rigorous empirical test. Feuerstein (1979, 1980) has presented a model of cognitive modifiability through mediated learning experience that also can be applied in schools. In earlier times, many scholars found the model of Guilford (1982) attractive, although its empirical foundations have proved questionable because of the use of Procrustean rotations of factorial axes. Baltes (1997) has presented a model of intellectual selection, optimization, and compensation that also could be adapted for school use, and has been used in cognitive education of the elderly (e.g., Schaie & Willis, 1986). Anderson's (1983, 1991, 1993, 1996) model of adaptive control of human thought (ACT) also presents possibilities for use in cognitive education.

WICS thus provides one among a number of unified models for identification/admissions, instruction, and assessment. Is WICS in any sense better than competing models? That is really a question for empirical research. We have done a great amount of empirical research, perhaps more than that done on some competing models, such as Gardner's, but certainly much less than that done for over 100 years on *g*-based theories. Our hope is that empirical research will continue to find ways of better supplementing *g*-based measures.

The WICS model can be used at any level and for any subject matter. An advantage of the model is that it goes beyond more traditional models emphasizing memory and analytical learning, and as a result, enables all students to capitalize on strengths and compensate for or correct weaknesses. It further reduces ethnic and other differences in performance commonly found in traditional assessments. It thus provides a basis for cognitive education that represents the realities of the 21st century rather than those of a bygone era.

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