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Summary

The research summary, "A Complete Education," presents the Obama administration's proposal for ensuring that all students have a comprehensive education. The key areas include: strengthening instruction in literacy and in science, technology, engineering, and mathematics (STEM); increasing access to instruction in a broader range of subject matter; and providing new opportunities for accelerated learning, particularly for low-income students in high-need schools. The report emphasizes literacy and STEM education, and its recommendations are based on several well-regarded and thoughtful reports from private foundations, professional associations, and national science groups. At the same time, however, the report's literature review is overly selective and superficial, neglecting significant research. The administration's research summary would have benefited from broader definitions of literacy directly relevant to its aims and from findings from innovative and successful instructional designs in literacy and STEM for low-income students of color. Other significant weaknesses in the report include: (a) the subordination of liberal arts education to literacy and STEM, even though the report asserts the importance of broad-based education; (b) the reliance on competitive grants without explaining either the research rationale or how the non-funded groups would be served; (c) the emphasis on state-level reforms without research support for this strategy; and (d) the use of test score results as the unquestioned measure of learning and achievement.

REVIEW OF *A COMPLETE EDUCATION*

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I. Introduction

In March 2010, the Obama administration released a *Blueprint*, outlining its proposals for reauthorizing the Elementary and Secondary Education Act (ESEA).[1] In May 2010, the U.S. Department of Education (USDOE) followed with a set of six documents, offered as "research summaries" supporting the administration's plans.[2]

The third of these six reports, titled "A Complete Education," is the focus of this review.[3] The administration's approach promotes four areas of PreK-12 learning: 1) literacy, 2) science, technology, engineering, and mathematics (STEM), 3) a well-rounded education, and 4) college pathways and accelerated learning.[4]

II. Findings and Conclusions of the Report

The research summary argues for new investments to improve teaching and learning. Within this framework, the report emphasizes literacy and STEM, with literacy given the greatest attention. Two additional topics, "a well-rounded education" and "college pathways and accelerated learning," are briefly addressed.

Literacy

This section is the longest (four pages) in the report and includes a series of findings and conclusions. The main recommendation is to broaden instructional practices to improve students' reading comprehension skills. The report uses results from the National Assessment of Educational Progress (NAEP) to advance the contention that U.S. students, particularly minority and low-income students, are not developing the reading-comprehension skills needed for college and careers. The report also notes a linkage between weak academic literacy skills and higher dropout rates, involvement in the juvenile justice system, and unemployment. It stresses that the U.S. does not rank among the top countries in international comparisons.

The research summary recommends that more broadly focused literacy approaches are needed to support students' learning beyond grade three. These approaches should include as essential elements attention to motivation, engagement, and writing. The report further asserts that systematic statewide literacy education strategies are needed to move districts and schools to "make real change in literacy achievement for all students." To pursue this goal, the report argues for a unified competitive grant program focused on comprehensive approaches to

strengthening instruction, coordinating resources, and supporting high standards. In this grant program, states would compete for federal funds; successful states would then sub-grant funds to high-needs districts.

STEM

The section on STEM is relatively brief. It opens with the claim that, in the 21st century, success in postsecondary education and careers requires a solid grounding in STEM as "essential preparation for all students." This claim is supported by a discussion of various forms of test data showing that U.S. students' STEM performance is generally lagging nationally and internationally, with continuing gaps along lines of race and ethnicity and of income level. This leads to two main recommendations: (a) improve the coherence of STEM education across all grades, and (b) improve teacher content knowledge in mathematics and science, particularly at the high school level. In support of these recommendations, the summary points to national reports on STEM education and a handful of research and think-tank studies that have identified weaknesses in the mathematical expertise and preparation of teachers working in low-income and minority schools.

As in its literacy recommendations, the report calls for a competitive grant program for states to support "a comprehensive PreK-12 state STEM strategy." The report also lists as a policy initiative, without elaboration, "outside-the-box" thinking on results-oriented innovation and technology.

A Well-Rounded Education

In a one-page section, the report acknowledges concerns that non-tested subjects, such as social studies and the arts, have been marginalized due to NCLB accountability requirements. It offers two recommendations: (a) the incorporation of content from social studies and the arts into English-language arts and mathematics instruction, and (b) the consolidation of various small federal funding programs into "a comprehensive authority with a focus on college readiness."

College Pathways and Accelerated Learning

In the final brief section, the report argues for increasing low-income students' access to accelerated learning opportunities such as participation in college-level coursework, Advanced Placement (AP) courses, and gifted and talented programs.

III. The Report's Use of Research Literature

The report cites a wide variety of sources for its claims and recommendations.[5] Journal articles and research-based publications are referenced in the Literacy and STEM sections of the research summary, although only about 25% of these citations appear to be peer-reviewed.

These two sections also cite various federally funded and private-foundation-funded reports, which function indirectly as summaries of relevant research in literacy and STEM.

Literacy

The report argues for systematic, broad-based approaches in reading-comprehension instruction. Specifically, it advocates the importance of "reading to learn" from grade-level texts and content-area textbooks in middle and high school. It grounds this argument in a summary

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of selected NAEP results showing persistently low levels of performance in both reading and writing, especially for minority and low-income students. These are supplemented by findings from selected sources about other areas of concern (e.g., college readiness, workforce literacy demands, dropout rates, incarceration rates and unemployment rates). These problem descriptions, taken together, are meant to create a sense of urgency for more broadly focused and systematic approaches to advanced reading comprehension instruction for all students and low-income students of color in particular.

It is important to note that the report's discussion of racial/ethnic disparities in NAEP scores and literacy skills omits any analysis of the ways in which socio-historical inequalities have structured and continue to structure these outcomes.[6] Nor does the report mention how few students, regardless of race/ethnicity or income level, score at the most advanced levels on NAEP. The absence of a more complex, nuanced argument regarding the meaning and validity of test scores and proficiency levels carries a number of potential risks. It risks reducing the definition of literacy simply to reading comprehension, rather than a broad and adaptive repertoire of literacy practices.[7] It risks reinforcing unfounded conceptions of low-income students of color as lacking the necessary productive literacy skills for academic learning.[8] It risks promoting oversimplified, unidimensional solutions—such as better reading-comprehension instruction—for what are far broader and more complex social and educational problems.

The research cited in support of the recommended comprehension-based approach to literacy instruction is sound and important, albeit superficially treated. It is also selective. It leaves out a critical and well-known body of research that provides a deep foundation for understanding how to improve educational opportunities for low-income students of color.[9] Significantly, this research includes examples of innovative instructional approaches that build effectively on students' out-of-school literacy skills for learning complex academic subject matter in high-poverty, urban classrooms.[10] Thus, the policies outlined in the research summary fail to take full account of highly regarded research on literacy and literacy education specifically related to the learning and achievement of low-income students of color.

STEM

This section of the report includes some scant STEM-related data designed to advance the notion of a need for a comprehensive state-led STEM strategy. It briefly touches on a few studies of teacher knowledge and preparation in mathematics and science and on priorities identified in U.S. national plans of action.

The report asserts that in the 21st century STEM learning is an imperative for all students, but it provides little in the way of specific justification for this claim. While few would argue that STEM learning is not important, it would be useful to know in what ways it is specifically deemed important to 21st century life and the resulting implications for STEM education. In fact, the linkage between STEM education and contemporary life is a hotly debated topic within policy and education circles, particularly in relation to workforce needs and global competitiveness—but also in relation to fundamental questions of human development.[11] Recent National Research Council reports offer reasoned arguments in support of a STEM learning imperative, as do other studies.[12] Indeed, a more developed analysis of the STEM imperative might have been used in this report to foster innovative thinking about policies and practices for preparing students to engage thoughtfully, creatively and humanely with the many complex problems of 21st century life. The report does not, however, provide this analysis.

Having asserted its major claim, the report then moves to a discussion of STEM graduation rates, national and international test results, and students' participation in high school STEM courses in relation to college access, graduation, and career earnings. This evidence is meant to demonstrate the need to strengthen STEM instruction, improve teacher preparation, and

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overcome continuing inequities in STEM learning opportunities for low-income students of color. But the implications of these data for the content, purposes and form of STEM education and teacher development are not explored. This is surprising given the ready availability of various research-based sources, peer-reviewed journal articles, and other well-researched studies and books, which offer specific proposals on these questions.[13]

The remaining three paragraphs of the STEM section touch on the importance of teacher knowledge in mathematics and science and on STEM recommendations from national leadership groups. Specifically, the focus is on highly qualified teachers and the importance of ensuring that students have equitable access to them. These paragraphs are brief and assertive in form. They present mathematics and science content knowledge as the only significant dimension of quality teaching, leaving aside other dimensions highlighted in STEM research (e.g., understanding students' thinking, cultivating funds of knowledge, and teaching responsively).[14] This section, in short, uses a very few studies in very limited ways. It does not include an explicitly elaborated, evidence-based argument for how its proposals would achieve

equal access to highly qualified teachers for students in low-income, high-poverty schools. Nor does it specify what it would mean to create (in the report's words) "vertical coherence" in STEM learning "with enhanced support for STEM teachers."

A Well-Rounded Education

As noted earlier, this section is one page in length, plus references. This stands in interesting contrast to the emphasis provided by the title of the research summary ("A Complete Education") and to the introduction's extolling the need for a well-rounded education. The underlying policy issue is unquestionably important: the decline of the liberal arts, especially in the context of NCLB. But the diminishment of the arts, history, foreign languages, and other important disciplines does not receive more than token treatment in the report. The research summary argues for the incorporation of content from these subjects into literacy and mathematics (not science), and cites a few varied sources in support of this recommendation. But the proposal to subordinate the arts and social studies to literacy and mathematics—rather than advocating for these disciplines' intrinsic educational value or for truly strongly interdisciplinary approaches—suggests that these areas of knowledge continue to be viewed as peripheral to public education.[15]

This section of the report also recommends the "consolidation" of seven "content-focused programs" in order to make more effective use of federal resources. How this consolidation will enhance these programs is left unexplained. Despite the acknowledged importance of "a well-rounded education," the presentation leaves the reader wondering whether the administration's plans will further erode, rather than enhance, the provision of a complete education for all students.

College Pathways and Accelerated Learning

This section identifies the need to increase low-income students' access to and participation in academically challenging courses at all grade levels. It is perhaps the clearest of the four sections, even at only two pages in length. The focal strategies are worthy of a more extended discussion than the report provides. The presentation is more a description of the problems, with two side-bar examples, than a considered, persuasive discussion of research-based strategies, including analysis of strengths and weaknesses.

IV. Review of the Report's Methods

The report provides a selected literature review in support of the administration's policy positions in the *Blueprint*. The sections on Literacy and Accelerated Learning include more documentation than the sections on STEM and A Well-Rounded Education. Perhaps as a consequence, the arguments for policy and practice in the first two sections are more clearly stated than in the last two.

The Literacy section appears to be strongly influenced by reports from the Carnegie Corporation's Advancing Adolescent Literacy (CAAL) initiative and the National Association of State Boards of Education (NASBE) Study Group on Middle and High School Literacy,[16] as evidenced in major overlaps in argument structure, recommendations, examples, specific

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language, and the listed citations. The most significant overlap is the core recommendation of focusing literacy education on developing comprehension skills needed to read content-area texts with understanding in middle and high school.

The CAAL and NASBE reports are thoughtful, well substantiated, closely argued, and specific in their recommendations for policy and practice. As such, they are strong sources for policy guidance in expanding literacy education beyond the narrow approaches and goals of NCLB. However, reliance on a limited range of sources excludes other important research with broader conceptions of literacy and literacy education. The recommendations, therefore, while sound as far as they go, still ignore significant research on the academic and instructional value of the literacy practices that low-income students of color use routinely in their lives outside of school.[17] Nor do the recommendations take account of the digital forms of literacy rapidly emerging worldwide. In short, the report emphasizes the worthy goal of building students' reading comprehension skills as a critical step in ensuring success in college and career, but it fails to address the dynamic context of an increasingly intercultural, digital, and multimodal world.

The STEM section of the report relies on summary data related to student test performance and participation in STEM courses. This section includes a brief overview of research on the effects of teacher knowledge in mathematics, an even shorter summary of variation in teacher knowledge in high school science, and a superficial sketch of national priorities for STEM identified in National Science Board and National Research Council reports, supplemented by two examples. This presentation adds up to a less-than-coherent picture of STEM policy and practice. It falls short of the stated priority of "A Complete Education" of enhanced professional-development support to teachers. Moreover, the scant, highly selective literature cited does not include any research that explicitly addresses cultural diversity as a resource in STEM education, and includes only a small sampling of research on inequalities of access, participation, and outcomes for low-income students of color.[18]

Finally, and perhaps most importantly in terms of the educational policy, the report's Literacy and STEM sections repeatedly emphasize achievement test scores to the exclusion of other important outcome measures. These scores are offered as the unquestioned measure of learning and educational progress. Without discussion of the limits of these measures as valid assessments of complex understandings and skills, and without consideration of other forms of

meaningful learning and achievement, the title phrase "A Complete Education" belies the report's content.

V. Review of the Validity of the Findings and Conclusions

While the research summary defines a number of urgent problems in U.S. education, it addresses them in narrowly conceived ways. This is surprising given that the summary relies on major private foundation and national science policy reports for its recommendations in literacy and STEM education. These lay out a more elaborated, substantial, and clearly defined agenda than that proposed by the administration.

The recommendations, for the most part, are tightly focused on literacy and STEM (with more emphasis on mathematics than science). They include a nod to history, social studies, the arts, and the "new content areas" of financial literacy and environmental education. However, no

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discussion is provided of the educational importance of these disciplines or the value of truly interdisciplinary learning as preparation for college, career and life. No discussion is offered about the ways in which digital literacies are evolving in the modern world. Nor is there any discussion of how these new skills will shape college and career demands. Thus, the broad, ambitious goals of the *Blueprint* are not supported by ambitious, innovative, research-based thinking.

In a striking omission, the report does not include leading scholarship that directly addresses learning and teaching in literacy and STEM for low-income students of color, even though they are repeatedly highlighted as a main concern of the administration's policies. This lack of consideration of this relevant research raises questions about the administration's understanding of the educational issues involved with supporting students from low-income communities in successfully completing college.

VI. Usefulness of the Report for Guidance of Policy and Practice

Overall, the report's research support for the policy initiatives in the *Blueprint* is overly selective and superficial. Thus, the report offers little useful policy guidance for achieving its ostensible goal of "a complete education" for every child.

The focus on reading-comprehension improvement is well supported in the field and unquestionably important. However, that focus offers a limited view of literacy, which risks

guiding policy and practice into an overly narrow channel: the belief that improvement in reading comprehension instruction is, by itself, a sufficient mechanism with which to address the educational problems raised in the report. Similarly, while a strong case for STEM education can be made, the summary does not make it with the necessary degree of research support or understanding. The sections on "College Pathways and Accelerated Learning" and "A Well-Rounded Education" are also sparse and inadequate from a public policy or research perspective.

Despite prioritizing "high-quality professional development," the report provides no specific guidance or discussion regarding deep, sustained, and practice-based professional development for literacy and STEM teachers.[19] Nor does it offer any specific guidance or discussion regarding models for the integration of literacy with STEM, despite the fact that there are numerous, well-developed approaches documented in the research literature.[20]

Several sections of the report propose "competitive grants" to states as a primary mechanism for implementing educational policies. The unstated message here is that some students will benefit from these programs and others will not. No research rationale is provided to justify the use of competitive grants, and it appears to contradict the research summary's statement that "we must ensure that states, districts, schools and teachers have the resources and assistance they need to help students reach these standards." Finally, the approach of implementing educational reforms and accountability measures at the state level lacks research support: it is more of an experiment than a proven model.[21]

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