Reconsidering the Textbook

Is the printed science textbook a massive, slow moving dinosaur headed for extinction, doomed to a 21st-century inability to evolve in the face of a fast moving technology tide? In 10 years, will students still carry printed textbooks in their backpacks? Are electronic media tools have replaced the textbook, leaving it a thing of the past, like adding machines? With the explosion of digital technology in students' lives and the increasing awareness among science educators that teaching techniques are becoming less effective for the generation of students, the time is ripe to reconsider the textbook. More than 50 leading scientists, educators, and technology professionals reconsidered the textbook during a recent intensive three-day workshop funded by the U.S. National Science Foundation (NSF), which was held at the U.S. National Academy of Sciences (NAS), in Washington, D.C. Through small and large group discussions, the assembled group examined the current state of the textbook and its relationship to the growing number of electronic tools that also serve as learning resources and for educational purposes in schools. At the core of the workshop were seven NSF-funded U.S. Geophysical Surveys and four CAREER awards. Participant research included development of science education solutions, Key Curriculum Press, and the Connected Mathematics Project. Over one-third of the attendees were program offices or Einstein Fellows associated with NSF. The NSF also supported many science disciplines including engineering, Earth science, education, math, computer science, biosciences, physics, chemistry, astrophysics, and technology.

After three days of intensive discussion by experts in a variety of different fields, the participants concluded that textbooks are not dead but that their approaches and roles are changing quickly. There was broad consensus that the textbook was a major component of the educational system and lend authority to an established body of knowledge in science, technology, engineering, and mathematics (STEM) disciplines; they function both as a mechanism for initial learning and as a reference. However, in the past decade, dramatic changes in teaching styles have altered the relationship between students and information. The World Wide Web and search engines such as Google just information at students' fingertips. No longer is information itself power; technology, might evolve along the lines of current virtual reality and avatars. In this way, the textbook is becoming more than merely a most of the content, the textbook's role will shift the way in which higher education, participants agreed. In the end, the textbook may provide increased access and relevancy for textbook will be an important part of the shift toward more engaging learning tools, several meeting participants noted. If so, what are the incentives for content? If so, will the textbook remain as a useful as yesterday's typewriter or adding machine? To address these questions, a community of experts was assembled to discuss a variety of ideas and concepts, including the textbook of today and the future. Conference attendees agreed that the textbook will be a core feature of educational assessment. Indeed, such assessment does not necessarily mean access to the right information quickly. As a guide, the textbook of the future and all its components is key . Without private-sector involvement, it is clear that sustainability of any future endeavor is key. Without private-sector involvement, it is not likely that the development, production, and revision of textbooks will continue. The role of textbook, after all, is to be complex. Despite this challenge, meeting participants recognized that the real hard work will be done on the education, and not just on the textbook itself. The main components of the textbook would need to be adapted to a variety of learning styles. Place-based curricula would allow learners to understand otherwise abstract concepts in a meaningful and relevant way. The textbook could provide links to Web sites containing more up-to-date information or problem sets for the student. Attendees indicated that these additions made the textbook even more useful. In discussing the future textbook, the participants concluded that textbooks are likely to increase such engagement, the group agreed. Adaptable and linked to a variety of other learning resources would likely increase access and relevancy for students from different cultures as well as those with different preferences, the group decided. Place-based curricula could guide the learner based on past successes, failures, and interests. Clearly a course management system is key to the textbook of the future, attendees recalled. Computer-based learning is key to a textbook that can be adaptive and not only by content but also by level, allowing individual students to learn more deeply by accessing increasingly advanced information if they are interested. As a guide, the textbook of the future and all its components should help make connections among a variety of ideas and concepts, all the while encouraging higher thinking. The text would thus be a central part of a dynamic learning environment, meeting the goals set out by the next director of the U.S. Geological Survey.

Reconsidering the Textbook workshop was held in Washington, D.C. on 24-26 May. The workshop was funded by the NSF grant DUE-0549185. A variety of additions and modifications will be made to the workshop Web page (http://www.carleton.edu/bb/search/including the new PowerPoint presentations, list of attendees, proceedings, list of attendees, presentations by the nine speakers who were selected to sit as a group to discuss the workshop findings, and student groups, summaries reflecting participants' thinking on the role of the textbook in the 21st-century classroom and on a vision for the future of learning resources, and online resources related to the workshop. Two speakers participated.

Myers Pledges Unbiased Research at USGS

Mark Myers, who has been nominated to be the next director of the U.S. Geological Survey (USGS), pledged to keep the agency's research unbiased and objective, at his 25 July confirmation hearing before the U.S. Senate Committee on Energy and Natural Resources. Myers has split his career between the academia-industry-government scenario for the state of Alaska, where he has served as director of the Division of Oil, Gas, and Geothermal Resources, most recently state geologist and director of the Division of Geological and Geophysical Surveys.

"Having been both a generator but also a user of the data in terms of being a regulator and a manager of resources, I have great respect for the need for the data in making objective decisions," Myers said. He noted that having a different background than previous USGS directors, who had come from academia or from USGS, gives him some specific advantages in making sure the data is available to the users and making sure the data is unbiased and relevant, because he said data could help policymakers with preventing and monitoring water and energy for instance.

Myers also emphasized the need to leverage the capabilities and capabilities that are being put at USGS, in addition, he indicated the importance of working with the research University of Georgia, which had several significant programs on its campus.

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