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Book Review

Higher Education in the Digital Age

William G. Bowen
Princeton, NJ: Princeton University Press, 2013

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Achieve more while using finite resources. That is the challenge alluded to by William Bowen in the book *Higher Education in the Digital Age*. The book compiles Bowen's address at the 2012 Tanner Lecture on Human Values at Stanford University in California. The Tanner Lecture is hosted annually at different international universities (e.g., Princeton, Yale, Stanford, and the University of Utah in the United States as well as Cambridge and Oxford in the United Kingdom). The purpose of the Tanner Lecture is to advance scholarly and scientific learning with respect to human values, transcending national, cultural, and subject-specific boundaries. As such, the format of the book is unusual; it begins with the author's lecture and it includes the responses from the discussants who participated in the Stanford event.

Bowen's credentials as an economist (specifically, an expert in the economics of higher education), administrator (the former president of Princeton University), and innovator (founding chairman of ITHAKA, a not-for-profit organization that supports the academic community through digital publishing) provide the foundation for the book and the lecture that preceded it. The book is brief and very readable for a layperson—I have no background in administration or economics. However, the brevity of the book leaves some noticeable gaps, and certain key issues are given insufficient detail.

Overview

The lecture portion of the book is presented in two distinct sections, the first dealing with economics, and the second focussing on the technology alluded to in the title. The first part of the book highlights the issues of economics in higher education. The key ideas are productivity and a term that Bowen coins as "cost disease." Bowen defines productivity as the ratio of outputs to the inputs used to produce them. This interpretation might be more applicable to an industrial factory setting than an educational one; the various human elements (including learning, experiences, skills, and social interaction) and the wide range of influencing factors (such as policy, resources, and infrastructures) in an educational setting are difficult to quantify as outputs. Complicating the matter, Bowen recognizes that university outputs represent both research findings and student learning. Although these are entirely separate institutional priorities, Bowen lumps them together as one educational output.

Cost disease highlights the issue of the rising costs of labour-intensive industries, such as education. There is little opportunity to offset the cost of labour with capital investment (as there would be in an industrial setting) so this expense increases disproportionately to other industries, and thus the productivity appears to decline. Bowen argues that the high cost of

academic salaries is responsible for the increasing costs and decreasing productivity in higher education. These human costs have not been mitigated by the benefits of technology until now. However, to emphasize that the issue is not a simple one, Bowen adds several more contributing factors to the economic crisis. One concern is the competitive nature of educational institutions, with each striving to outdo the others in terms of residences, sports and recreational facilities, and state-of-the-art lab spaces. Even student aid is included in the quest to outdo other institutions at the expense of fiscal sustainability. Bowen stresses that certain Ivy League universities with large endowment funds are disproportionately able to provide student grants and bursaries. It is not a level playing field.

Another contributing factor is the inefficiency of multi-layered educational administration. Bowen cites suggestions from consultants that decentralized universities could save money by simplifying certain structures such as human resources and purchasing. The scope of expanding program offerings is also a concern; "[e]ducational institutions are good at adding things, but not good at subtraction" (p. 11).

The nature of Bowen's lecture presentation was not conducive to solving these economic issues or even to exploring them deeply. They were merely presented to provide a foundational context to the fiscal dilemma. One of the discussants in the book, Daphne Koller, concurs that in the context of education, one cannot measure productivity. In fact, she suggests that first educational leaders need to reach a consensus on what factors to measure. This would indicate the value and impact of higher education. Koller suggests some factors could be: student completion and enrollment; learning outcomes as a measure of students' understanding; graduate income; and job satisfaction. In a previous book, Bowen, Chingos, and McPherson (2011) investigated dropout rates at American universities, and so Bowen is aware of such human factors as parental education, family income, gender, and how these factors affect educational "output." Thus, it is surprising that he introduces the fiscal crisis in such an industrial framework.

As the title of the book suggests, digital technology can mitigate some of the economic crises facing post-secondary institutions. In part 2, Bowen examines the potential opportunities and pitfalls provided by online learning. He does not present it as a panacea but he admits that his original negativity toward it has been lessened over time. He envisions the opportunities for improvement that digital technology might offer. Some of these factors include: collaboration among faculty; timely feedback for students; more active learning opportunities for students; and adaptive learning that responds to students' errors. He envisions that technology can facilitate increased exposure to global perspectives in education, continuous and lifelong learning, and a decrease in rising costs. He describes an example of a collaborative and interactive online course from Carnegie Mellon University (CMU) in Pittsburgh, Pennsylvania, as an example of this vision. His interpretation (and praise) of the CMU course and my critique thereof are described in greater detail below.

The exploration of digital technology in part 2 concludes with the subtheme of Massively Open Online Courses (MOOCs), including a brief description of their challenges and opportunities. The scope of MOOCs that can provide instruction to thousands of students can overcome issues of access and equity. However, Bowen counters this benefit with the issue of the sustainability of offering free courses. He also queries the demographics of successful students. Although traditionally the completion rate in MOOCs is low, Bowen cites an example of an electronics subject MOOC offered at the Massachusetts Institute of Technology, where four out of five students who actually completed the course had already taken a comparable university

course. Their motivation for participating was not to learn new material but to review and refresh their understanding. Thus, the target audience and their purpose for taking a MOOC might need to be examined. The discussion of MOOCs is brief and superficial with the format of the lecture not conducive to a lengthy and in-depth examination. This is a missed opportunity because one of the members of the panel that followed his lecture was Koller, who is also a co-founder of Coursera, a leader in the implementation of MOOCs.

The book concludes with comments from each of the discussants from the Tanner Lecture and a response to each from Bowen. The panellists were Howard Gardener, professor of Cognition and Education at Harvard University; John Hennessy, president of Stanford University; Andrew Delbanco, Chair of American Studies at Columbia University; and Daphne Koller, professor of Computer Science at Stanford University and co-founder of Coursera. Their discussion highlights some of the issues but in a brief, collegial, and non-critical manner. This discussion format is standard for the Tanner Lecture. This selection of panellists includes prominent speakers who are administrators, instructors, and innovators in higher education. The preface to the book includes a one line introduction to each individual, but more background information would have been appreciated.

Criticism

One of Bowen's main criticisms of the field of online learning is a lack of empirical evidence to support the implementation of such initiatives. However, his critique highlights one of the flaws in his argument. Bowen blames the designers of online courses for not building in mechanisms to evaluate courses, and he criticizes institutions for not establishing control groups to compare the results of online instruction with courses delivered in traditional formats. However, in making such criticisms, he fails to acknowledge the different strengths and emphases brought to a teaching context by different instructors, as well as the perceptions and participation of different groups of students. In human interactions, control is difficult to decree.

Bowen laments the lack of hard evidence to support the claims of online learning. He disparages what he calls the missionary spirit of the creators of online courses who are passionate about the technology and seek to implement it without research-based evidence. Their goal is pedagogic, not analytic. Bowen, the economist, wants data.

The one empirical study of online learning in higher education that Bowen provides as an example is problematic. He cites a study involving a prototype statistics course at CMU as an exemplar of what rigorous educational research in this field should look like. This course used a blended approach with one face-to-face session per week, and a cognitive feedback loop to guide students through difficulties. The study included 600 participants from six different university campuses, representing three distinct institutions. The quest for a controlled study is flawed by the variation in teachers conducting the face-to-face sessions. Students were randomly assigned to the hybrid course or a traditional model. The CMU study found that there was no significant difference in the standard measures of learning outcomes (e.g., exam scores, pass rates, or completion rates). The study also found that these results were consistent across diverse student populations representing different demographics, such as socioeconomic levels, educational backgrounds, and grade point averages. The flaw in his inclusion of this study, and the highlighting of it as "the most rigorous assessment to date" (p. 48), is his personal bias and perceived professional conflict of interest. The study Bowen describes was conducted by ITHAKA, an organization that he co-founded, and that co-published this book. It was surprising

that Bowen did not acknowledge this potential conflict of interest. It is not uncommon for scholars to cite studies that they were involved with because they have a deep knowledge of those studies. However, to hold up this particular study as the most rigorous assessment to date may be misleading. Perhaps the lecture format more explicitly addressed this link, but the book did not.

Another flaw in Bowen's argument is his insistence on quantitative data and "gold standard methodology—randomized trials" (p. 47). He recognizes the human element of educational institutions: e.g., in part 1, teachers and students seemed to contribute to this fiscal challenge; and he acknowledges the various learning styles and preferences of students that can result in positive or negative perceptions toward online learning. However, he does not embrace the ways in which qualitative research could inform such initiatives. He criticizes a lack of evidence, but it is unclear if he would accept the merits of qualitative data. Analyzing and implementing research from the complex context of human interactions benefits from the rich insights of qualitative research (Patton, 2002).

This flaw in Bowen's argument is further highlighted in a quotation he attributes to William Baumol: "'In our teaching activity we proceed without really knowing what we are doing … without evidence as to the topics that should be emphasized, or the tools the students should learn to utilize'" (p. 47). Bowen also questions whether we are clear in our course objectives and teaching and learning activities. He asks if we accordingly match the tools (technological or otherwise) and acknowledges that this lack of alignment pre-dates the advent of online learning. Existing course syllabi are developed without empirical studies and they are adjusted regularly to improve teaching.

Bowen seems to be holding online learning to a higher standard, requiring empirical studies to support and validate digital pedagogy. Bowen fondly recounts the enduring mentoring relationships he developed with his university instructors. Can the flexible and personal nature of the teacher-student interactions be replicated in an online large scale format? Perhaps Bowen is highlighting the variations of possibilities that exist in higher education. At the end of his book, he argues against a one-size-fits-all strategy, seeming to contradict the objective of a shared and standardized online format.

In his description of institutional competition in part 1, Bowen describes how universities try to outdo one another with resources, facilities, and student funding. The fiscal crisis, in part, is due to a response to differences in values and personal choices. However, he seems to overlook the merit of recognizing the institutions for their individual strengths and talents (e.g., size, facility, location, or resources).

Strengths

Despite the criticisms listed above, or perhaps because of them, this book contributes to the emerging field of online learning and its place in society and in education specifically. Online education is not a panacea to solve all of the challenges in education, but it can, through careful selection and implementation, mitigate some of them. This book highlights the diverse range of instructional formats in both content and process. A particular format will be better for some material and some users than others. The book's content was originally presented as a public lecture for a limited audience and a definite time and space. The book format allows delivery of the same information to individuals who were not present at the original Tanner Lecture. A current habit of post-secondary students is to video record their lectures on mobile devices for

easy reference at a later time. Given the subject matter, republication of Bowen's lecture via YouTube might have been more authentic to the original message.

Due to the public nature of Bowen's original lecture, this book is of interest to anyone in higher education. It is not prescriptive, and it will not solve the issues it presents. However, it does provide a foundation of how and why the financial crises have developed.

The evolution of education—including higher education—is not in question. Bowen explains that resources (including technology, finances, space, and time) change, and society's priorities are dynamic. New fields of learning are being created, and old ones become irrelevant. Educational institutions must responsibly embrace such changes in response.

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