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**Review of *Demographics and the Demand for Higher Education*,
by Nathan Grawe (2018)**

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Abstract

Nathan D. Grawe. 2018. *Demographics and the Demand for Higher Education* (Baltimore: John Hopkins University Press). 175 pp. ISBN 9781421424132.

Grawe introduces the Higher Education Demand Index (HEDI), a new probabilistic model designed to produce more nuanced forecasts of college attendance in the US than one-dimensional predictions based on the declining number of 18 year-olds. Using HEDI, Grawe confirms that nationwide attendance at both 2-year and 4-year schools is likely to decline over the next decade, but that the nature of this decline will vary by type of institution, geography, race and ethnicity, and parental income and education levels; some institutions may actually experience increased applications and enrollment. Grawe provides forecasts for percentage decrease or increase in college attendance across nine geographic areas divided into 63 divisions (28 urban and 35 non-urban), incorporating differences across these variables. The target audience includes “administrators and trustees who are responsible for recruitment, admissions, student support, tenure practices, facilities construction and strategic planning,” and one might also add instructors experiencing or interested in changing patterns of diversity at their institutions. Readers of *Numeracy* involved in these roles in higher education may thus find the book of interest, but even those who are not may appreciate the quantitative modeling and application of statistics to a significant real-world problem valuable.

Keywords

Higher Education, Demographics, Numeracy, Policy, Modeling

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Cover Page Footnote

Mike Catalano is the Book Review Editor for this journal. He is a professor of mathematics, chair of the mathematics department, and Dean of the College of Healthcare, Fitness, and Sciences at Dakota Wesleyan University. He is a former member of the Board of Directors of NNN and has a particular interest in incorporating numeracy into college algebra through the use of examples related to social issues.

Introduction

In his 2018 book *Demographics and the Demand for Higher Education*, Nathan Grawe begins by noting the by now persistent pessimism about the “impending collapse” of higher education “under the weight of looming demographic change.” Grawe’s book serves as a “not so fast” or perhaps a “yes, but . . .” to this familiar refrain. As a faculty member and erstwhile associate dean at a private college, Grawe brings a more than academic concern about this trend along with a passion for and knowledge of numeracy to his work. Upon reviewing existing forecasts of demographic change, Grawe concluded these prognostications provide only broad strokes of the upcoming challenges facing higher education and not enough detail to help decision-makers plot a course for their particular niches or individual institutions.

To address this deficiency, Grawe developed the Higher Education Demand Index (HEDI). This index provides an estimated conditional probability of a student attending college based on a host of demographic variables (geographic location, race/ethnicity, parental education, family income and composition, sex, and nativity). The grist for the model are data from the 2002 Education Longitudinal Study (ELS)¹, the American Community Survey (most recently from 2011)², the Center for Disease Control’s (CDC’s) *National Vital Statistics Reports*³, and other readily available data. The idea is to provide a more detailed and nuanced picture of what particular institutions are facing, one that they can use to make better informed decisions about how to address their unique challenges. The book includes its own recommendations for action based on institutional characteristics.

The Book

Grawe’s Introduction provides a good overview of the book, chapter by chapter. It describes the HEDI and uses a pair of hypothetical high school graduates to illustrate the “vastly different likelihoods of college attendance” among 18 year-olds. One is, among other things, a female Asian-American living with two parents in Boston who have more than a bachelor’s degree in education and a combined income of \$125,000. The second is a male of Hispanic descent, born in the US, and living in rural California with his single mother, who makes \$40,000 per year and did not graduate from high school. HEDI predicts the first has a 95% chance of attending college and the second 10%; these probabilities are

¹ <https://nces.ed.gov/surveys/els2002/reports.asp> (all websites accessed June 3, 2018).

² <https://www.census.gov/programs-surveys/acs/>

³ <https://www.cdc.gov/nchs/products/nvsr.htm>

lowered to 70% and 2% if we consider attendance at an ‘elite’ institution (defined by Grawe as ranking in the top 50 nationally). These two hypothetical students illustrate the main message of the book: whether one considers the point of view of the student (and parents) or institutions of higher education, demographic changes produce different effects on different individuals, organizations, and even market niches.

The next two chapters outline in general terms the “demographic headwinds” facing higher education and the extent to which these headwinds form its destiny or only constraints. A key headwind is the so-called recent “birth dearth” caused in large part by the 2008 recession, the impact of which will be felt starting in 2026. Other factors discussed here are immigration, interstate migration, differences in birth rates between ethnic groups, and the existing geographic distribution of institutions of higher education.

Stephen Hawking quipped he was once advised that each equation he included in a book would halve the sales. In Chapter Three, Grawe gets into the details of the HEDI, and two equations are included, which we hope will not fulfill Hawking’s prophecy in this case. The first equation is fairly straightforward, saying simply that the demand for college (measured in number of students) in a particular year in a particular area is the product of a probability of attendance factor and the number of college-age children in the area in that year. The probability factors are based on the aforementioned ELS, which codes students in a number of ways including by the type of institution they attend. The second equation separates the first into summands by any desired set of demographic groupings. The nitty-gritty details that go into the development of these equations (along with a lot more equations) are provided in a methodological appendix, which the more highly numerate readers are likely to find of interest, but the appendix is certainly not necessary reading for following the main text. In addition to taking into account demographic variables, the HEDI also considers the type of institution a student might attend, categorized first by any postsecondary institution and then by two-year institutions or four-year colleges and universities; the four-year institutions are divided further into an ‘elite’ class (the top 50 colleges plus the top 50 universities according to *U.S. News and World Report* rankings, so around 100 total), a ‘national’ class (the next 50 for both colleges and universities, so again about 100 total), and regional institutions (all others). One main take away from this chapter is how severely the probability distributions for attendance vary across these classes. This variance comes into play in later chapters as Grawe discusses how the demographic headwinds are likely to affect different classes of institutions in very different ways.

Chapters Four, Five, and Six apply the HEDI to forecast demand for higher education across the demographic variables and institutional classes described

above for each of 63 geographical subdivisions, the 28 largest metropolitan areas, and 35 areas designated as nonmetropolitan. These subdivisions are chosen in part to ensure that each provides robust sample sizes, all having populations of at least 2 million. Chapter Four considers aggregate demand for higher education by focusing on changes in the population of 18 year-olds, Chapter Five considers two-year institutions, and Chapter Six four-year. Maps are provided indicating the forecast growth or (more typically) decline in college attendance in percentage terms for each of the 63 subdivisions, and for subgroups defined by the variables (race and ethnicity, parental education, etc.) and classes (elite, national, regional) mentioned above. A reader with only time to browse can get a good idea of which regions and types of institutions within those regions are facing the biggest challenges with respect to attracting students.

Chapter Seven, entitled “Is Anyone Paying for All of This?,” considers forecasts from the point of view of students and parents. How will widening income inequality and flattening wages affect the decisions they make? At the top of the income scale are “full-pay families,” those with the means to cover the cost of education without federal or institutional financial aid. The HEDI predicts that the number of full-pay students will actually increase over the next eight years. Given that these students tend to attend elite institutions, and assuming those institutions do not increase their enrollments, some institutions (most likely the national institutions in the next tier down) may be able to cushion the effects of the overall diminishing pool of applicants by successfully attracting more of these full-pay students. As with all HEDI forecasts, regional differences apply.

Chapter Eight provides some possible strategies institutions might implement over the coming decade, divided into three main categories. The first is the “hard-nosed approach”—charge more and (selectively) provide more financial aid in order to increase net revenue in the face of falling enrollment. The second is “the hopeful path”—attract more students, bucking the trend of lower attendance. Grawe calls the third alternative “the nimble path.” This option involves an institution identifying and successfully recruiting students from markets they have not hitherto competed in. For each of these general strategies, Grawe identifies the opportunities, potential pitfalls, and likelihoods of success.

To this point, the book has focused on who will be going to college in the coming years, how many of them there will be, and where (geographically) they will be attending. Chapters Nine and Ten focus on graduates. Will colleges and universities produce enough of them to meet workforce needs? If not, what can policymakers do now to address the potential shortfall? Here, Grawe notes that the US is falling behind its peers; even today, fewer than 40% of young US adults complete a four-year degree, while many European countries exceed 50%. The good news is that some traditionally under-represented groups like non-white Hispanics and lower-income students are gaining ground. However, attendance

rates for these groups still lag behind those for Caucasians, and some of these groups (especially Hispanics) are becoming a larger proportion of the population; thus the good news is not a harbinger of increased overall attendance or completion rates. As an aside, this seeming Simpson-like paradox is a concept appropriate for a quantitative literacy course. What can be done? As one example, Grawe does point to research indicating that a \$1,000 reduction in net tuition projects to an additional 3.5% to 5% more students, often higher for under-represented groups and lower for Caucasians. However, the details of implementation matter, and reducing net tuition is no guarantee of increased enrollment. Still, Grawe holds out hope for the possibility that the trends predicted by the HEDI can be altered through plausible (if not easy) policy interventions.

The final chapter discusses possibilities for the years past 2030, accompanied by appropriate precautions regarding the diminished confidence we can have in projections made further into the future.

Concluding Comments

Grawe's book is timely, well-researched, and thought-provoking. Especially college or university presidents would be well-served to give it a thorough reading, and this reviewer will certainly be sharing the book with his. We should note Grawe is drawing national attention, including an interview in the *Chronicle of Higher Education* (Hoover 2017),⁴ and a review by Jeffrey J. Sellinger in the *Washington Post* (Sellinger 2018).⁵ Bryan Alexander, an internationally known futurist and consultant on technology in education (with a background in English language and literature), refers to Grawe's work as "the most important book about American higher education in 2018" in his own online review (Alexander 2018).⁶

As a huge added bonus to the material in the book, the associated website⁷ includes ample and interesting resources including data sets (the raw material for the HEDI and its projections), color versions of maps included in the book, and other supplemental resources organized by chapter. The numerically inclined are particularly pointed to the material related to the Technical Appendix (also referred to as the Methodological Appendix in the book). Much of this analysis is on the high end for undergraduates, but the basic trends pointed to throughout the

⁴ Available at <https://www.chronicle.com/article/Demographic-Changes-as-Destiny/242062>

⁵ Available at https://www.washingtonpost.com/news/grade-point/wp/2018/01/27/higher-education-is-headed-for-a-supply-and-demand-crisis/?utm_term=.f8626ff9a3ac

⁶ Available at <https://bryanalexander.org/demographics/the-most-important-book-about-american-higher-education-in-2018/>

⁷ <http://www.people.carleton.edu/~ngrawe/HEDI.htm>

book can be meaningfully presented not only in quantitative literacy or statistics classes, but also possibly in economics or other courses in the social sciences (e.g., research methods). It is worth noting that economics is Grawe's own background.

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