**Rating and Ranking Universities, What Criteria are Most Aligned with Creating T-Shaped Faculty and Students?**

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CHAPTER 5

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**Abstract**

For many years people in government and business organizations have urged universities to try to produce T-shaped people who have both technical expertise and an ability to work well with others. In recent years universities have moved strongly in the opposite direction, toward greater specialization. This article will describe why this change has occurred and the effect on universities and on the creation of T-shaped people. We end with two suggestions: One way to broaden the thinking of students is to increase the attention paid to multi-disciplinary fields such as systems science. A second possibility is for business and government to expand internal programs, such as corporate university curricula, to include those aspects of a T-shaped body of knowledge that universities are not covering.

**Keywords**

corporate universities, cybernetics, process improvement methods, systems science

**Introduction**

Large organizations in business are staffed by people who need technical expertise and an ability to work effectively with other people. Universities, on the other hand, are staffed by people with detailed knowledge in a single field and only limited knowledge in other fields. Faculty members win promotion by becoming experts in usually quite narrow fields. Consequently, they need to be reminded of the need that students have for broad understanding and interpersonal relations skills. This need is usually fulfilled in universities by administrators who repeatedly emphasize the importance of interdisciplinary communication and cooperation. Statements by people from business and government organizations, expressing their desires for graduates with T-shaped skills, reinforce these needs for faculty and students. However, in recent years the emphasis in faculty hiring and promotion has been in the opposite direction toward greater specialization rather than balance between breadth and depth.

**Why there has been an Emphasis on Specialization**

There is a self-reinforcing cycle of factors which works against the breadth of learning needed for T-shaped professionals. This cycle involves specialized knowledge which supports the division of labor; research as reinforced by funding sources; academic journals by which faculty are judged with respect to publications of their research findings; and curricula which are based on research, and on the topics in which faculty specialize.

Further, what organizations measure and reward significantly affects their end results. The importance of T-shaped people has been recognized for some time (Hansen and Oetinger 2001). The primary emphasis in U.S. educational systems, however, has been towards STEM (science, technology, engineering, and math) programs. Compounding this movement has been the significant rise in student loan debt and concerns about degrees leading to employment, which would allow for repayment of those loans. The value of breadth is well-recognized, but what seems to matter in the marketplace are specialized, technical skills.

An added complication has been the advent of consumer rating systems, which now apply to universities. Prospective students (and for many undergraduates, their parents) can see universities assessed and ranked online without having to visit or do research for themselves. In response, universities play to the ranking systems, which thus far seem to have little, if anything, to do with producing T-shaped professionals. This has affected not just U.S. universities but most well-known universities around the world, as they compete for a single pool of potential students. Each of these topics will be expanded and explored in this paper.

**Breadth and Specialization**

There has long been a difference between what business and government say is needed (T-shaped people) and what academics like, or feel pressured, to do (e.g., advance their disciplines). For many years, a broad curriculum in the first two years of undergraduate studies and a more specialized curriculum in the second two years was the consensus strategy. For reasons noted above, there has been growing pressure to reduce the time and expense needed in education. This has tended to privilege technical and quantitative skills over ones such as literature, critical thinking, or communication.

The cycle described above might make sense if only narrow specialization was needed in practice by organizations. That is obviously not the case. Moreover, research reveals that practical problem-solving ability and breakthrough research are produced by multi-disciplinary teams (Hollingsworth and Hollingsworth 2000; Hollingsworth, Hollingsworth and Hage 2006).

**The Challenge for Universities**

Faculty are hired and promoted in research-oriented universities, based on their contributions to the bodies of knowledge, as evidenced through their publications in academic journals. This process is familiar and well understood in most countries. Increases in knowledge have supported innovations and societal advances of many kinds. An ongoing challenge, however, has been bringing knowledge together across domains, as well as the coordination of work involving many specialists. The more complex problems become, the less adequate is a single domain of knowledge for solving them. Likewise, the more complex our innovations, the more interconnected are the relevant domains of knowledge involved.

Many organizations now see the need for T-shaped professionals, those with deep expertise and a breadth of capacity in understanding and applying knowledge across domains. A looming question is how to foster such professionals, especially through the traditional university system.

Historically, universities were known by their reputations, associated with prestigious faculty members and alumni (e.g., Nobel laureates), important institutions (e.g., members of Congress), research breakthroughs, and so on. Presently, students and their parents select universities based largely on the annual rankings of universities published by sources such as U.S. News and World Report and The Financial Times. These rankings are important because they influence how many students apply to a university. The number and quality of applicants has a large impact on a university’s revenue and the quality of the academic climate. Consequently, universities around the world are devoting great energy to improving their performance on the factors that are used in the rankings. The efforts by universities to improve their rankings are certainly admirable. But are the factors used in the rankings the best indicators of quality universities, and does this redirection of faculty attention improve the quality and production of research or improve the educational experience for students?

Studies of research productivity raise doubts (Umpleby, Anbari and Mueller 2007; Shneiderman 2016). For years, studies of high quality research organizations have found that breakthrough research—research that redefines a field—almost always is produced by multi-disciplinary teams. Consequently, by changing the evaluation of faculty research from high-impact contributions in specific fields of study to simple counts of articles in highly ranked journals may be misdirecting faculty efforts.

To rise in rankings, many universities have altered their policies, particularly the way they evaluate faculty research. The current rating scheme rewards universities whose faculty members publish in the top journals in their field. The “tyranny” of the top journals was criticized by Nobel laureate Randy Schekman in 2013, when he called for a boycott of Nature, Science, and Cell, arguing that they actually distorted the progress of science (https://www.theguardian.com/science/2013/dec/09/nobel-winner-boycott-science-journals).

Sometimes publications in interdisciplinary journals are not counted at all. In the past, faculty members were expected to publish in journals with a high impact factor, but there was less emphasis on journals in the faculty member’s field or those geared toward practitioners. The result is that now doctoral students and young faculty members will often immediately reject an opportunity to work on an interdisciplinary research project on the grounds that such work will not help them find a job or be promoted. In fact, such work will require time and effort that could be used on projects that will aid their careers.

**Public Ranking of Universities**

How did it happen that business publications came to be in the position of deciding how universities are evaluated? At a macro level, there are at least two answers. First, large bureaucracies, including universities, became the icons of inefficiency. Critics of bureaucracies most commonly offered market-driven competition as the answer to improve efficiency, regardless of the nature of the institution. Banks, insurance firms, healthcare networks, and schools were all pushed to become more market-driven and competitive. The second answer has to do with the speed and proliferation of data and scholarship. In a world where data overload has become the norm, rankings have become the filter for finding only the “best” of any given category, saving curious searchers from wasting time exploring inferior choices. Appearing at the top of a list of search results has become an imperative unto itself.

From the perspective of universities, a high ranking appears to correlate with large endowments. For 2014, seven of the ten U.S. universities with the largest endowments also fell into the top ten ranking of the U.S. News and World Report list (http://www.usnews.com/education/best-colleges/the-short-list-college/articles/2015/10/06/10-universities-with-the-largest-endowments). That does not equate with cause and effect, but it is easy to see why college presidents and boards would aspire to the prestige of top rankings. From the perspectives of parents and students, getting into a highly ranked university is believed to correlate with post-graduate success, due to the personal connections made with influential people, or the apparent prestige of the degree, or both. Given the rising costs of higher education, and of student debt in the U.S., it is no surprise that students and their families would want to maximize the return on their investments. Unfortunately, there are no guarantees.

According to a Bureau of Labor Statistics report (http://www.bls.gov/cps/minwage2012tbls.htm#6), the rate of college graduates working minimum wage jobs increased by 71 percent between 2002 and 2012. A college degree has become a necessity largely because of the poor prospects for employment without one (e.g. only having a high school diploma).

One recent analysis (http://www.dailyindependent.com/cnhi\_network/college-is-worth-it-who-should-pay-for-it/article\_612b005a-e100-528f-b9b4-2129861ae7ff.html) argues that we should return to a higher level of public funding for education. The rationale is two-fold. First, funding has dropped to the point that 62 percent of the costs for higher education in the US come from private sources. That compares with the OECD average of 28 percent. Second is the argument that higher education produces significant public good, in addition to the private good of better jobs and income.

The intent to measure quality in higher education is certainly admirable. The related questions are what should be measured, and why, and how? The U.S. News and World Report ranking system includes seven criteria, weighted in the following ways:

* Undergraduate academic reputation (22.5 percent) – based on surveys of college administrators and high school counselors
* Retention (22.5 percent) – six-year graduation rate plus first-year retention
* Faculty resources (20 percent) – class sizes, faculty salaries, etc.
* Student selectivity (12.5 percent) – admissions test scores and class ranking of entering students, plus acceptance rates
* Financial resources (10 percent) – average spending per student on instruction, research, student services, etc.
* Graduation rate performance (7.5 percent) - difference between a school's six-year graduation rate and the rate predicted by U. S. News and World Report
* Alumni giving rate (5 percent) - average percentage of living alumni with bachelor's degrees who gave to their school

Unfortunately, nothing about these criteria reflect a move towards the creation of T-shaped professionals. If anything, they have moved away from traditional notions of quality in higher education. They reflect something closer to consumer satisfaction with a service rather than the measurement of learning in the context of what is needed in the society at-large.

**Redesigning Universities to Produce T-Shaped People**

If a new rating scheme is developed to guide a more relevant education, other improvements could be considered as well. The current rating systems interfere with research productivity by emphasizing journals with very high rejection rates. What about the kind of research and teaching that is done? Universities tend to be overly specialized, both in research and in teaching. But problems in the world do not appear like problems at the end of chapters in textbooks. The ability to encounter a real world problem and formulate and enact an appropriate response, usually working with a group of people, requires skills that go beyond textbooks used in courses. Those skills are highly prized by employers in business and government.

Systems scientist John Warfield (1996) suggested a structure for a university that would educate some people with these skills. His design was proposed as a solution to an earlier problem. In the 1950s, 60s, and 70s several systems science centers and institutes were established on university campuses. These centers brought together faculty members from several disciplines – for example, mathematics, philosophy, engineering, social science, management, and medicine – to work on pressing social problems. In the 1980s and 90s, most of these programs closed. The engine of destruction was the accrediting organizations. Periodically academic programs are accredited by organizations that examine indicators of program quality, for example percentage of PhD qualified faculty, faculty to student ratio, etc. Accrediting organizations usually insist that all programs in a field on campus be evaluated. For example, the MBA accrediting organization does not want there to be business or management programs on campus that they have not evaluated. This usually meant that a management program in a systems science center would have to be closed or moved into the accredited program in the Business School. Over several years each accrediting organization would visit a campus and carve out a part of the systems science center. When there was little left, the center would close.

To protect multi-disciplinary programs Warfield proposed a different structure for a university. The schools of a university would be grouped into three colleges. A Heritage College would teach what has been learned in the past – the sciences, arts and humanities. A Professional College would focus on present activities – Schools of Business, Law, Medicine, and Engineering. A Horizons College would focus on future challenges. The curriculum would be interdisciplinary and design oriented. Faculty and students would work with clients on real problems. Faculty members from the other two colleges would work on problems when their skills were needed. Hence, the Horizons College would serve as a catalyst for cross-disciplinary communication within the university. The core curriculum of the Horizons College would be systems science and cybernetics, highly interdisciplinary fields which tend not to find a home in existing universities. The purpose of this structure of the university would be to protect the design oriented, problem focused activities in the Horizons College from discipline-oriented accrediting organizations and create a home for systems science and cybernetics curricula. A different accrediting organization could be created for such programs.

**Conclusion**

It seems that people in business and government want universities to educate T-shaped people, but people in universities, while probably in agreement, have other opposing goals and priorities. What is to be done? One course of action is for advocates of T-shaped curricula to work with what seems to be a growing educational reform movement. Rather than begin with basic science, programs could start with practical, service-oriented courses. Encouraging design schools and structures similar to Warfield’s Horizons College would probably achieve much of the T-shaped agenda. A supportive action would be to offer courses in systems science and cybernetics since these fields provide both breadth and depth. They aid cross-disciplinary communication, and they emphasize participatory methods as the way to work with social systems.

A second course of action would be for businesses and government agencies to incorporate into their own training programs the T-shaped educational material that is needed but that universities are not providing. Something similar happened in the 1980s when there was great interest in quality improvement methods in businesses, governments, and universities, following the success of quality improvement programs in Japan. When it became clear that universities would not modify their curricula as far as businesses wanted, corporations adopted quality improvement methods as the core curriculum in their in-house training programs. (Umpleby 2002, 2015) Corporations decided to provide the remedial instruction needed for graduates of university programs.

Before we begin to measure, we need to determine what we actually value, and why. Bela H. Banathy spent 20 years at the Far West Laboratory for Educational Research and Development. His contention was that our educational systems were vestiges of the Industrial Revolution, and could not simply be reformed. They needed to be designed anew fundamentally, in relation to the environments which they served. The approach he suggested was large-scale social systems design, involving all relevant stakeholders (Banathy 1991, 1996).

Similar calls for fundamental change have been echoed at T-Summit meetings over the past three years (http://tsummit.org/). Using different words, the same sentiment was expressed in a recent Harvard Business Review article by Joseph Aoun, President of Northwestern University (https://hbr.org/2016/04/hybrid-jobs-call-for-hybrid-education). He calls for a hybrid educational model to meet emerging hybrid job demands.

If we take seriously the need for T-shaped professionals, changes in our educational systems are essential, and incremental change will not be enough. Better measurement of the status quo is the wrong direction. What we need is a measurement of “fit” with the new societal structure that is taking shape. A decade from now, we may be comparing the changes in education (more likely, in processes of learning) with the changes from railroads to aircraft, or from adding machines to computers.

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