What Makes a University 'Great'?
Some Reflections

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Evaluating universities ('grading' them as poor, satisfactory, good, excellent, or great, e.g., claims such as: "Stanford, MIT, Caltech, and Harvard are great universities in the US"; "the IITs and IISERs are great universities in India"), as well as ranking universities (nationally or internationally, e.g., Which are the top ten universities in the world?) both demand a set of ***standards*** and ***criteria*** that form the basis for the evaluation and ranking.

Teaching and Research

Developing standards and criteria to evaluate the quality of universities requires clarity about their ***mission*** — what they are committed to doing. Like a primary school, secondary school, or college, a university is an ***educational institution***. So its primary commitment is to helping students get what is of value to them and to humanity at large. In contrast, the primary commitment of a ***research institution*** is advancement of human knowledge. Thus, the mandate of the Jawaharlal Nehru Centre for Scientific Research (JNCSR) is "to pursue and promote world-class research and training at the frontiers of Science and Engineering …" (http://www.jncasr.ac.in/)

Universities, in addition to the commitment to education, may also be committed to making a contribution to the collective pool of knowledge. These are ***research universities***. Thus, IISER-Pune is "a research-intensive teaching institute." (http://www.iiserpune.ac.in/) When it comes to colleges, whether for liberal arts or professional education (engineering, medicine, law, management), their commitment is to teaching.

The choice between research-and-teaching on the one hand, and teaching alone on the other, is reflected in the policies in faculty appointment and promotion. A doctoral degree and research publications form the basic criteria for appointment and promotion in a research university. In a teaching university, the faculty is evaluated on the basis of their teaching; a PhD and publications are optional.

What makes an undergraduate program of a university a great liberal education program is very different from what makes it a program for specialization in, say, neuroscience, philosophy, or mathematics. And both are different from what makes it great for nurturing future researchers. So, when evaluating a university, the first question has to do with its chosen mandate: Does it aim at generally educated individuals, specialists in some field, professionals, or future researchers?

The Function of Education

A university's primary function, as mentioned above, is educating the young; and education is the process of helping students learn what is of value to them in their future lives. Hence, the question, "What makes a university great?" translates as: "Given the mandate(s) of the university, how valuable is what they learn at the university?" Often, in the pursuit of making itself attractive for students and their parents, making it prestigeous, and making it "successful", universities lose sight of the value of the outcomes of the learning process. Systems of evaluation and ranking also lose sight of the fundamental function of universities.

Take, for instance, the write-up "What makes a good university?" at http://galgotias-university.blogspot.com/2011/12/characteristics-of-good-university.html It talks about "Qualified teachers and professors", "Good infrastructure", and "Understanding and able management". Likewise, the Forbes article, "What makes a University Great," at https://www.forbes.com/2009/08/10/world-class-best-university-ranking-world-bank-opinions-colleges-salmi.html - 3df0664a1fc2 talks of a high concentration of talented teachers, researchers and students, sizable budgets, and freedom, autonomy and leadership. Neither write-up says anything about the ***quality of learning*** that the university program seeks to ensure.

What Makes an Undergraduate Program Great?

Ignoring the research function of a university, let us narrow our question to: "What makes an undergraduate program great?"

To address this question, we need to be clear about the ***function*** of the program. In a large majority of cases, those with undergraduate degrees end up in careers unrelated to the subject they major in. (e.g., Many with a Bachelor's in physics become bank employees, administrators, managers, politicians, or poets, none of whom may need knowledge of physics beyond what they learnt in secondary school.) A small minority may proceed to a Master's program, but not necessarily to research. Even those with a PhD in a subject may not pursue a research career.)

Given this situation, we must recognize different functions an undergraduate program can opt for:

FUNCTION	PREPARING LEARNERS
General Education	for their personal, professional, and public lives, regardless of their 'specialization'
Specialization	for higher studies, and for careers requiring that specialized knowledge.
Research	for a career in research in their field of specialization.

The nature of 'greatness' we looking for in evaluating a program would depend on (must be aligned to) the program's choice from among these functions.

Designing Curricula for an Undergraduate Liberal Education Program

As an example, let us look at the challenge of designing an undergraduate curriculum for the function of general education, which we can elaborate as:

> *a program to prepare the mind to meet the challenges of the learner's personal, professional, and public lives, regardless of their chosen field of specialization or career, and to work towards the wellness of oneself, one's community, and the planet with all its creatures.*

A curriculum for such a program would involve two components, those of understanding, and of abilities.

Understanding: Breadth and Depth

A program for general education needs to aim for adequate ***breadth*** of understanding, covering

- the external world we live in (the physical, biological, and human studies)
- the world internal to our consciousness (ethics, values, abstract concepts…)
- logically possible imagined worlds (mathematics)

and

- ways of exploring these worlds

In providing the required breadth, programs can be structured:

either in terms of *disciplines* (geometry, number theory, algebra, astronomy, physics, chemistry, biochemistry, botany, zoology, psychology, sociology, economics, history, and philosophy), where students can take courses from a diverse range of baskets;

or in terms of *phenomena*, *questions*, and *concepts* across disciplinary boundaries or fields of specialization.

The first option, followed in most current mainstream education programs, is made up of information and fragmented bodies of knowledge.

The second option offers (has the potential to yield) an interconnected, integrated understanding of the external, internal, and imagined worlds, and their exploration. Such a program requires its syllabus to be structured around trans-disciplinary and multi-disciplinary concepts and questions. We should elaborate that statement a bit.

A ***trans-disciplinary*** syllabus has to be structured around trans-disciplinary concepts like structure, function, system, organization and self-organization; change, history, development, evolution; theory, prediction, correlation, causation; categories, units, and levels; connecting these concepts to their specialized manifestations. Take, for instance, the concept of CHANGE, to be understood as a difference in the traits of an entity along the parameter of time. 'Motion' (in physics), and 'migration' (in physical, biological, and human domains) are instances of the concept of CHANGE-OF-LOCATION. Socio-cultural changes in human history, and evolutionary and developmental changes in biology are instances of the concepts of CHANGE-OF-PROPERTIES, CHANGE-OF-STRUCTURE, and CHANGE-OF-FUNCTION, all of which are instances of the transdisciplinary concept of CHANGE, as are PHYSICAL CHANGES and CHEMICAL CHANGES that school textbooks introduce students to.

A ***multi-disciplinary*** syllabus is structured around questions and problems that require understanding multiple fields of specialization. For instance, understanding how we interpret the world around us on the basis of information our eyes receive requires bringing together human biology, cognitive neuroscience, optics, and geometry. Making sense of our experience of day and night and of seasons calls for a combination of astronomy, optics, heat, dynamics, and geometry. And understanding human behavior calls for a combination of genetics, neuroscience, psychology, sociology, anthropology, economics, and history.

The sustained exploration of questions and problems from the trans-disciplinary and multi-disciplinary perspectives facilitates ***depth*** of understanding, without the fragmentation brought in by the walls that separate disciplines. The best way of ensuring such depth would be for a student to pursue a single question or problem over an extended time, ranging from weeks to months.

Abilities: General and Specialized

The distinction between breadth and depth discussed above in terms of understanding also extends to the domain of abilities. For instance, consider the following academic abilities that we expect university education to nurture:

Independent Self-Directed Learning: ability to make choices on what one wants to learn, and to do so from printed or digital resources, without having to depend on teachers and classrooms.

Critical reading and listening: ability to unpack and evaluate the claims and justification in written and spoken materials, and to decide for oneself what to accept, what to reject, and what to set aside for further scrutiny.

Critical thinking: ability to arrive at judgments on the merits of beliefs, actions, and products on the basis of a careful examination of relevant considerations and choose between competing options.

Independent inquiry: ability to: identify and clarify questions and problems to investigate; identify and implement methodological strategies for the investigation; arrive at answers and solutions, and the conclusions arising from them; justify the conclusions to the satisfaction of a jury of fellow inquirers; and critically evaluate conclusions and their justification.

Communication: ability to express, with clarity, precision, and effectiveness, one's ideas, questions, strategies, answers, conclusions, and their justification, through speech and writing.

Each of these general (trans-disciplinary) abilities have their specialized manifestations. Take, for instance, inquiry abilities. The ability to design experiments to test a hypothesis is trans-disciplinary, but the ability to design an experiment to test the hypothesis that fruitflies have consciousness is specific to the study of insects. The ability to provide an argument to justify a belief or action is trans-disciplinary, but the ability to provide an argument to justify a mathematical conjecture on numbers or on shapes is specific to mathematics. As students proceed from trans-disciplinary inquiry abilities to specialized inquiry abilities, they move from inquiry to research, taking with them a stable foundation.