Blueprint for a Renaissance University

Sanjay Sarma, MIT

An architectural image of the Singapore University of Technology and Design
Introduction

The role of the university is changing. No longer the mere bestower of status, the funnel for selection, or the trainer of workers, the university of the future must be firmly committed to deep learning, to authentic intellectual development and to creating innovators for the economy and for society. Creative thinking, self-efficacy, leadership, entrepreneurship, ethics and the drive to improve the world must be intertwined with depth and breadth of knowledge — not in a bookish, regurgitative sense, but in a way that truly enables the absorption of knowledge in pursuit of societal, commercial and personal goals. This is a Renaissance University.

The Shape of Renaissance Universities

Pedagogy:

A Renaissance University must focus on modern cognitive psychology principles: learning in context; spaced, interleaved, interpolated learning; learning by doing; integrative projects; emphasis on design and synthesis; work experience; focus on motivation; curiosity-based learning; authentic research; focus on mastery and outcomes; the importance of mindfulness; the value of apprenticeship; and so on. A great deal has been written on these matters. A revolution is occurring silently with a focus on creating a new breed on Millennial graduates. Pedagogy is at the center of this revolution.

See oepi.mit.edu and future.mit.edu. Also, see Economist article here.

Lectures

Routine lectures are now widely recognized to be of limited efficacy. They are not necessarily compatible with the working of the human brain, they do not promote engagement, and they presume a level of absorption that the science and results show to be optimistic. There is much evidence to show that online material, combined with projects, workshops and synthesis-oriented activities in flipped classroom mode are vastly more effective. When lectures are conducted, there is great evidence that active learning with online aids like clickers and, digital learning used for interpolation, are necessary to sustain attention, but
more importantly, to promote long term memory. Lectures can also be inspirational, contextualizing and motivating. But the lecture of yesteryear is not the best way to educate in a 21st century university.

Faculty

Faculty in the renaissance university must have a new mental model. They must be intellectuals in the true sense of the word. They must be focused on authentic research, which I define more below. They must be versed in learning principles centered on students rather than on lecturing one-way. They must understand modern pedagogy. They must create true learning experiences for students which they continuously update. They must understand the psychology of learning, motivation and curiosity. They must see students as partners in co-creation rather than passive listeners. They must be entrepreneurial in spirit. And they must be diverse — including other countries — must be engaged to keep the environment from becoming unidimensional. Finally, efforts must be made to keep faculty moving by creating many visiting and temporary slots so that visitors from industry and from other universities can visit for periods. This will reduce the threat of stagnation.

Research

Research must be authentic. This means it must be high quality and original. For example, a researcher in India may be interested in nano-technology, but she must have the gumption to define new nano-technology problems that are relevant and applicable in the India context rather than mimicking a colleague’s work at Purdue or Karlsruhe. Can nanotechnology be used to improve water filtration in the Indian context? Is there a company interested in commercializing this product? Can this turn into a startup? Authenticity implies “owning the problem” and pursuing it with vigor with a determination to see it through rather than checking boxes for a resume. But authentic research need not be all about the latest trend that shows up in Nature Magazine. A researcher in Nigeria can do deep, authentic research on why the concrete structures in that country may be leaking water. What coatings help prevent that problem? How is the construction industry using these products? Why does it not? Is there a training issue? These are the cross-disciplinary links that authentic research promotes — across fields such as sociology and policy. Most importantly, authentic research applies the best of scholarly thinking to authentic problems.

Authenticity has many benefits: it is real, it is applicable, it has impact, it is motivating to students, and most importantly, you own it, rather than being a peripheral player in someone else’s research vision.

Design

We are in the era of design. Advances in techniques for making — whether it is a new business or a new component (see below) — have made design a paramount skill. Design is also the ultimate expression of creativity, a culmination for years of learning, and a deeply empowering skill for the learner. To be able to design is to be able to change, to improve, and to conceptualize the new. The teaching and the practice of design must be a central element of the Renaissance University. This requires professors with the skills and the aptitude for
design, an environment which rewards and facilitates new ideas, and an ecosystem for displaying, appreciating, commercializing and institutionalizing new designs. Design is not just engineering: it can be architectural, policy-oriented, social, systemic, philosophical, artistic, humanistic and educational.

Making

There are many new technologies that are enabling an era of rapid realization of one’s creative efforts: social networks, crowdsourcing, crowdfunding, Arduino’s, Raspberry Pi’s, 3D printing, laser cutting and so on. These new capabilities create a (good culture) of instant gratification and a positive cycle of synthesis. Rapid prototyping also encourages rapid deployment, design thinking, testing and lean innovation. These are innate new thinking patterns that the modern college graduate must turn into instincts. Delayed gratification, often described as a good habit has increasingly been questioned as a convenient restatement of an unfortunate constraint. Students who focus on the doing learn better.

Architecture

The new university should provide a different architecture: one which promotes doing, making, synthesis, discussion, field work and teamwork. It should consist of breakout rooms, private alcoves, and facilitating equipment. There should be classrooms, but they need to be different — fewer, designed to accommodate equipment and computers, reconfigurable, informal and accessible. There should be many fewer amphitheaters than there should be before. The architecture should also have common spaces which promote interactions, sport fields which promote rounded development, easy access to public transport to promote a connection to local environs, a playful and creative look and feel to promote creativity, and flexible spaces to incubate startups.

Calendar

The academic calendar the world over has been defined around the agrarian calendars in Europe and in the US. The calendar should be rethought for modern times. There should be flexibility for students to take courses and drop courses, and to drop into school and drop out for startups. The MIT Future of Education study examines these questions: future.mit.edu. the slavish adherence to ideas long outdated have fundamentally impeded progress in education.

Personal Development

The liberal arts — from artes liberales in Latin — were conceived as a way to focus on the development of the personality. This should always remain in focus in any university education, particularly in a Renaissance University. Leadership, teamwork and a civic sense must be combined with a self-efficacy, ethics, drive, grit and flexibility. Regardless of the field of study, the humanities, arts and social sciences must remain central to the education of the student, must also be integrated across the curriculum in an integrated and authentic way. Too often these components of the curriculum are treated as boxes to check. But we know that a humanistic education is essential in the modern world — even in fields like engineering,
where art, aesthetics and anthropology are becoming central and differentiating attributes in design.

**Conclusions**

There have been many exciting new university ventures that have tiptoed in these new directions: SUTD in Singapore\(^1\), Ashoka University in India, and so on. However, the journey has just begun, but the ultimate destination requires larger strides.

As Socrates, Plutarch and Yeats have said in various ways,

> “Education is not the filling of a pail, but the lighting of a fire.”

The education system we have today was invented before the science of learning was understood, and is based on a key misunderstanding of learning: that knowledge can be inscribed on the student’s brain as if it were an empty sheet of paper, and as if the teacher held the pen. This has been shown to be false. The learner actually constructs a mental model of the world based on the content from the environment, and the learner needs to be in charge. This is inconvenient, and has been ignored in the pursuit of an industrial approach to education because of expediency. Ironically, the traditional approaches to education were more sympathetic to the needs of the human brain — whether it is yeshivas, gurukuls and monasteries, or apprenticeships in Renaissance Europe. After all, Michelangelo and Leonardo likely attended very few lectures. Yet we have created a system which ignores both heritage and science. The time for change is upon us. Thus the concept of a Renaissance University.

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\(^1\) I was director of the MIT/SUTD Collaboration until 2012. More about the collaboration [here](#).