



LEADING CHANGE: FUTURE-PROOFING SCHOOLS

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The evolution of universities - a long view

Medieval university – community of masters and scholars; “truths in the natural order”; knowledge for its own sake; generalist knowledge; ivory tower; a name ; a central location; system of lectures; a procedure for examinations and degrees; administrative structure for faculty

Modern university (19th century) – transmission and discovery of useful knowledge; inside the general social fabric of society; departments (specialization) and institutes; research libraries ; needs of society instead of individual students; discovery of the new; solutions of problems; training of men at a really high level; graduate schools of arts and sciences; solidly professional schools; certain research institutes.



The evolution of universities - a long view

Multiversity (20th century) – more functions than simply instruction and research; extension services; consulting services; testing services; technology business incubators; technology licensing; continuing education; high schools; competitive sports

Fully online schools (21st century) – no central physical campus; distributed learning centers; small central office; very huge enrolment; system of coaches aside from faculty members; engineering and IT programs can now be accredited by ABET under the same criteria as those used for F2F



Future Shock*

Keep attuned to the times to arrive at the future at the time it happens

Mapua – new engineering programs – among the first in CoE, first in BioEngg; first mainframe in a private school; testing services in the 60's, continuing education in the 80's; extension in the 90's; research in the 90's; consultancy services in the 2000's; patenting service in 2011; first patent application in 2018.

Better yet to help define or invent the future if you can

*with apologies to Alvin Toffler



Future Shock

Schools around the world were shocked by COVID-19 although it is not the future we speak of (though Bill Gates may disagree).

We scrambled to pivot to fully online mode and realized this mode is no longer the future, as it would have seemed just ten years ago, but already the present, leaving us with the feeling that we may have arrived at the “future” a bit late. Almost all the ingredients for a rich educational experience, superior in some respects and inferior in others to F2F, are existent and need only be put together.



Going Global and Digital in the 1990's

Buzzwords: globalization, world-class; IT, www

- Competition for faculty, students and research funding
 - ASEAN University Network (AUN) and ESA-UNET formed
 - Beginnings of the APEC Registry of Engineers
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- Dial-up internet
 - Mosaic browser
 - Email
 - Education/Training materials in CD
 - Faculty experimentation with rudimentary graphics



Going towards a global and digital future at Mapua

- Gigabit network
- CS & IT degree programs
- UN's MDGs and SDGs
- ABET accreditation
- OBE
- A lofty vision and a metric to measure its realization
- Internationalization of research
- Internationalization of education
- Adoption of online education



Going towards a global and digital future at Mapua

Gigabit network

Student management system – registration; grades submission;
etc.

Dial-up internet

Email & file transfers – administrative and academic

www - browsing for educational content; Mapua website



Going towards a global and digital future at Mapua

CS & IT degree programs

- ABET and PTC-ACBET accredited
- Special tracks supported by partners: MS, CISCO, HP, Oracle, Netsuite, Huawei, SAP, SAS, COMPTIA, SOPHOS
- First Master's in Business Analytics program
- PhD in Computer Science by research

- Renewal of accreditation, close partnership with companies, and research proofs the programs against obsolescence of curricula
- Graduate research helps keep programs current & even shape the future
- Existence of the CS/IT programs helps keep the university up-to-date in digital technologies



Going towards a global and digital future at Mapua

UN's MDGs and SDGs

- Global-scale concerns are part of globalization
- In 2020 Mapua was given Times Higher Education (THE) rankings on: *SDG 6*: Clean Water & Sanitation; *SDG 7*: Affordable & Clean Energy; *SDG 8*: Decent Work & Economic Growth; *SDG 12*: Responsible Consumption & Production; and *SDG 17*: Partnership for Goals
- Being concerned about humankind's future and doing something about it keeps the school relevant and helps build a better future for all



Going towards a global and digital future at Mapua

ABET accreditation

- Shift to outcomes-based accreditation in year 2000
- Washington Accord members adhere to a common set of outcomes; principle for global agreement on standards
- Accreditation, not just substantial equivalency, of non-American programs to the same program outcomes
- Accreditation and its renewal cycles brings and keeps Mapua programs up to global standards and proofs them against future advancements in the fields of study



Going towards a global and digital future at Mapua

OBE

- At-scale adoption because of ABET outcomes-based accreditation
- Outcomes is the basis of regional and global agreements: international accreditation accords, mutual recognition agreements; international qualifications frameworks, international register of professionals, *etc. lifelong learning, credit transfer systems competency-based certification, microcredentials*
- OBE gives the school the vehicle to link to global standards in education and the profession; proofs it against isolation from the geographical world, the world of work and the future

Going towards a global and digital future at Mapua

A lofty vision and a metric to measure its realization

- Mapua envisions itself as a global center of excellence and as being among the best universities in the world
- Not just a pie in the sky because there are metrics, imperfect though they may be, to determine the degree of attainment
- Mapua was ranked under the QS Asia University Rankings in 2018
- The effort brought internal changes to Mapua to make it confident in advancing towards if not indeed helping invent the future



Going towards a global and digital future at Mapua

Internationalization of research

- Mapua developed international research partnerships with faculty development component
- Led to increase in research capability
- Exponential rise in SCOPUS research papers starting year 2015, a major factor in QS ranking
- Working at the frontiers of knowledge keeps a school current and aware of where the future may lie



Going towards a global and digital future at Mapua

Internationalization of education

- Faculty and student exchange
- Visiting professors
- International Plant visits
- International OJT
- International student research internships
- Helps us keep our ears on the ground about schools and work in other countries and keep pace with global trends



Going towards a global and digital future at Mapua

Adoption of online education

- Technical Journals on CD
- Web browsing corner of the library
- MIT OCW, Khan Academy, curated content repositories, *etc.*
- Open-source LMSs; asynchronous; (Moodle, Canvas, Edmodo) faculty initiative; faculty training
- Proprietary LMS for more functionalities; add-on softwares
- Active learning, self-pacing, instant feedback, gamification
- Blended learning is preferred mode
- Digital Day, Digital Rush
- Not just for convenience or class-suspending events, but more so for enrichment of educational experience
- Online in the service of OBE

Stirrings of the future

- New school models
- New educational technologies: AI - adaptive learning & personalized instruction; AR/VR; quantum internet
- Future of work: Industrial Revolution 4.0 - internet of things; massive cyber-physical systems; data; AI
- Biology as the science of the 21st century: the unanswered questions in science; intersections with computing



THANK YOU!