Transformative foresight: Universiti Sains Malaysia leads the way

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ARTICLE INFO

ABSTRACT

This article describes Universiti Sains Malaysia's foresight journey. It begins by exploring five alternative scenarios of higher education: (1) The A' la Carte University, (2) The Invisible University, (3) The Corporate University, (4) The State University, and (5) The University in The Garden. These scenarios are followed by Universiti Sains Malaysia's preferred vision of the future. It then examines the journey towards the preferred vision by articulating four stages of transformation: visioning, contesting, dynamic equilibrium, and self-direction/externalisation. The article concludes with an analysis of USM's current position, in transition between the contestation and dynamic equilibrium stages.

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"It is part of perfection that it contains in it imperfections."
– Abu Bakar r.a. (The 2nd Leader in the Islamic Caliphate)

1. Responding proactively in a reactive institutional context

One of the fundamental challenges facing higher education in Malaysia is responding proactively to a changing international world and complex domestic politics. Institutionalizing foresight is even more difficult in a higher education Ministerial context. Policies and frameworks tend to be past-based and strategic goals are generally short-term oriented. Moreover, the future planned for is singular. This means there is a lack of an adaptive capacity to negotiate changing futures since only one future is assumed, with the banal mantra "the children are the future" [1]. Finally, the top down approach to planning reduces resilience and robustness of plans as stakeholders "give away" futures thinking to others. Over time they become conditioned to structure – the weight of history – defeating agency, the capacity to create desired futures. Individuals and institutions are thus not well equipped to deal with external changes and internal weights. But this does not need to be the case. Universiti Sains Malaysia (USM) is a case study of successful foresight decidedly within the constraints of timid national educational policy. Agency can overcome structure.

University Sains Malaysia is unique in that it has engaged in a complete foresight-futures studies program. Though futures studies is not yet institutionalized at the university either through a graduate institute or as part of strategic planning it has been championed over the past five years by the University's Vice Chancellor, Professor Dzulkifli Abdul Razak. USM began its foresight/futures studies journey after a meeting between the vice-chancellor and Sohail Inayatullah at a February 2005 Asia-Europe Foundation meeting of European and Asian vice-chancellors, deans and educational Ministry representatives in Luxembourg. The meeting intended to better understand the dramatic transition universities are

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experiencing, and what these changes may portend for the long term future. Generally, critical trends identified were globalisation, particularly the neoliberal model wherein states consider education less as education and more as a cost [2]. Second was virtualization, distance education delivery through various web formats. Third was a flattening of education with power relations changing; with power, particularly definitional, moving to the grassroots, the younger generation and those with digital know how and accessibility. Finally, there was the possibility of centre-periphery relations changing such that the Centre is far less able to define the terms of the Others' education [3]. Among the concrete outcomes of the meeting for USM was Dzulkifli Abdul Razak's decision to experiment with the futures process, not only to engage university stakeholders strategically, but to begin to move beyond strategy and towards transformation. The transition from strategy to transformation involves a process of trust building towards a shared future and, as much as possible given political constraints, including stakeholders in the scenario building and visioning process.

2. The futures process

The USM foresight process formally began with a keynote lecture by Inayatullah in Penang in April 2005. Had senior professors and deans not accepted the model, the process would have concluded then! Inayatullah asserted that Asian universities were in flux and that merely following the West would only produce used and colonized futures. Instead it was suggested that, after a careful articulation of scenarios, USM create its own desired future with its own measurement indicators, after all, we only do what we measure [4]. This presentation was followed by a number of foresight workshops (May and December, 2005). Using the futures triangle methodology, images of the future, critical drivers and disenabling weights were first identified. These images included the *A' la Carte University*, the *Garden campus* and the *Regional campus*. Weights included the power of the Ministry to define local realities and the changing nature of the world economy. Foresight workshops moved eventually to scenario development, visioning and backcasting. The process was highly interactive, with role playing being used to enhance forecasting efficacy.

While the initial workshops were full of the usual suspects of deans, leading professors, and up and coming young leaders, over time the process seeped throughout the university culture. Varied communities of interest, from students, to alumni, to industry partners were invited to participate and strengthen, deepen and critically assess the scenarios and resultant strategies. This was done in order to gain legitimacy and access ideas that senior leaders may have missed. Within the more traditional context of not only Malaysia but the top-down feudal nature of the modern university, this was adventurous and showed the administrators' willingness to take risks in order to create different futures. Finally, the foresight process was not only focused on possible alternative futures, desired visions and strategies but implementation as well. As the latter part of this paper demonstrates, it has been theorized and acted on. USM's innovation has led to it being recognized as an APEX university in Malaysia. In practical terms this means increased funding, increased stature and ultimately enhanced agency to chart out its own course, within Malaysia, and Asia also.

While the focus of this article is the foresight process, including the scenarios developed, it is important to note that the adoption of the futures studies approach was in the wider context of innovation at USM including cluster research, trans-disciplinary and multidisciplinary collaboration, and the university in the garden concept. The foresight project was specifically aimed towards allowing stakeholders to explore new frontiers in building capacity for change. This is a crucial note – foresight grew within a social ecology of multiple innovations – each innovation stood on its own and was able to influence other innovations. The meta-narrative that emerged and continues to emerge, is that adapting to change and creating desired change is the new norm. While there are always niches in any organization where one can hide, by and large, the entire university – as a process, as a learning organization, and as a complex interaction of persons, institutions and desires – was and continues to be involved in this change process.

3. The alternative scenarios of higher education

To develop alternative futures of higher education, the process used was Inayatullah's Six Pillars [6] – though at the time of the workshop the third pillar, "Timing", was collapsed into the second pillar, "Anticipating the future". The six pillars (MATDCT) are: mapping the future, Anticipating the future, Timing the future, Deepening the future, Creating alternatives and Transforming the future.[2] The project began with the key question: "What are the alternative futures of higher education

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[2] These scenarios were developed based on the MATDCT futures methodology which represents the "six pillars" of futures studies:

(1) Mapping of the future (M) – A mental-trigger session that looks into: (a) the futures landscape through shared history and shared futures, and (b) the development of futures triangle;

(2) Anticipating the future (A) – A thought-provoking session that aims to disturb the map using: (a) emerging issues analysis (EIA) and (b) the futures wheel;

(3) Timing the future (T) – the use of macrohistory to determine the particular phase the organization is in.

(4) Deepening the future (D) – An unveiling session that opens the pathway for understanding hidden assumptions about the future. It is based on the causal layered analysis (CLA) methodology and theory of knowledge;

(5) Creating alternatives (C) – An in-depth session which develops the details of scenarios, complete with the litany, system, dominant worldview and guiding narrative; and

(6) Transforming the future (T) – A visioning session which involves backcasting. While scenarios outline alternatives, vision points to where individuals personally and collectively wish to go.
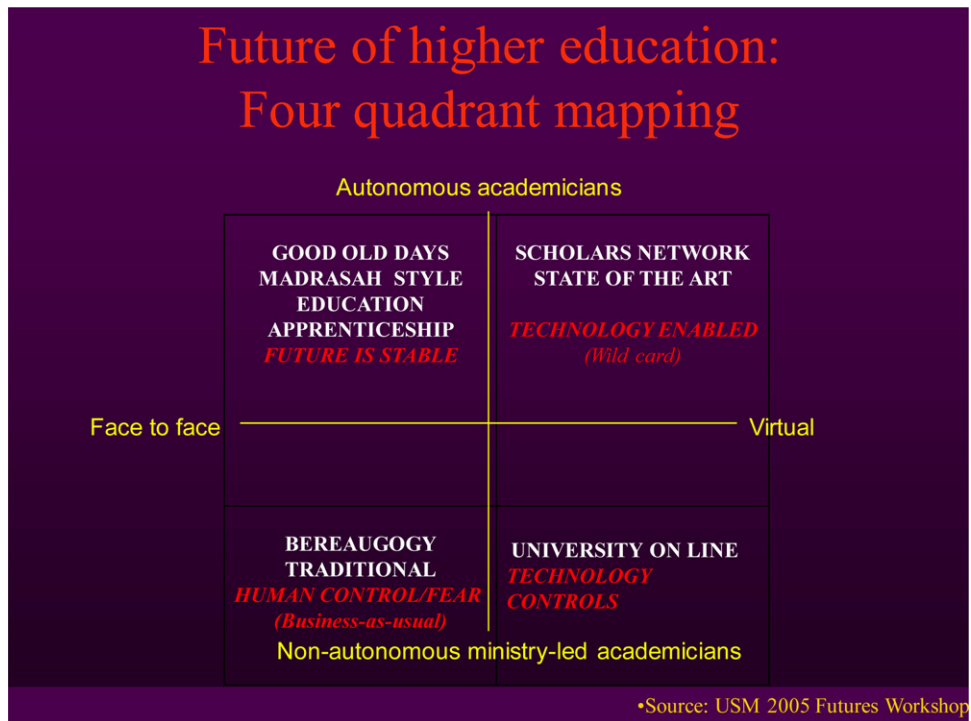
Fig. 1. The future of higher education in Malaysia.

in Malaysia in 2025?" Framing the issue in the futures context allowed stakeholders to distance themselves from the present, to contour the unknown and imagine new opportunities [5]. Day-to-day administrative and budgetary challenges, not to mention students knocking at the door and the ubiquitous need to find funding, were left in abeyance. For some, moving from the zone of certainty to the uncertainty of a zone of change was uncomfortable. However, this was identified from the first as an issue, that is, foresight is not necessarily solely about the future; rather, the future can be used as a way to transform today. To do so, it was suggested that participants moved from strategy or single loop learning to double loop – learning about learning – and to narrative foresight, the compelling stories of the future. While the futures triangle identified the contending images – dominant, alternative, marginal [7] – of the future, Graham Molitor's emerging issues analysis identified disruptive issues [8]. These included: customized learning/democratization of education, full-emerging civil society, robotized lifestyle, open source systems, total access/digitization of knowledge and brain direct interface.

The creating alternatives part of the foresight process – the scenario-building process – began with the question: "What are the two most crucial uncertainties about the future of higher education"? Based on the double-variable method [5,6] the two key uncertainties were: (1) the extent of intellectual freedom which academics would experience in the future, and (2) how the learning environment would change in the future. These two uncertainties were developed into a four-quadrant matrix with four variables: face-to-face lectures vs. virtual knowledge navigator; and autonomous academicians vs. non-autonomous ministry-led academicians (see Fig. 1). These four variables formed four quadrants, which reflect the future of higher education in Malaysia. The upper-right quadrant (scholars-network), represented an outlier (a disruptive emerging issue in the future).

Based on extensive discussions, new strategic conversations and multiple passionate debates, five key alternative scenarios of higher education emerged [9]: (1) The A' la Carte University, (2) The Invisible University, (3) The Corporate University, (4) The State University, and (5) The University in The Garden. What follows are descriptions of these alternative scenarios of higher education which capture the images, stories, culture and particular contexts of the future.

3.1. The A' la Carte University

Metaphor: "A worldwide academic menu offering a cocktail of courses"
Myth: places value on 'prosumers' and stakeholders who ultimately design their own education.

In this 2025 world, USM has shown its ability to withstand competition among the burgeoning public and private institutions. It stands out as a world class research university with its own identity and brand that differentiates it from other universities worldwide by offering its own niche: educational programmes designed around the A' la Carte philosophy.

The A' la Carte philosophy presents a metaphor where USM offers a world-class 7-star A' la Carte dining experience in a restaurant. With strong R&D in full kitchens and accredited by World Cuisine Association, it serves a myriad of academic

cuisines from the research kitchens ranging from state-of-the-art palatable centres such as neuroscience, molecular and biotech, advanced composite, and marine science. World Renowned Academic Chefs are qualified to prepare all kinds of academic cuisines that meet different cultural needs: Mediterranean, Malaysian, Indian, Chinese, British, Japanese, for example. For academic dining pleasure, well-trained administrative officers are readily available to serve the individual every need. For a sit-down menu, a student has the flexibility to select one's own academic cuisine or choose from a myriad of take-away academic cocktails. If the menu does not meet one's needs, other options are available through the USM partner restaurants worldwide.

The new myth – here using myth not as true or false but as defining reality – of the day is that an A' la Carte University now provides a cocktail of courses from a flexible academic menu of offerings as opposed to rigid, well thought out and tested curricula. Academic departments are expected to collaborate in creating innovative programme offerings or menus. The menu is negotiated with partners, hosts, students and agencies, and will be subjected to the rigor of curriculum development process but more in tune with the market needs. By meeting market needs, students have a greater chance to find employment after graduation.

The university caters to the differing needs of lifelong learners in collaboration with other world class educational providers. USM's strong footing as a research university does not preclude it from offering courses that appeal to both worldwide learners and employers, making it one of the leading educational providers of choice in the region as well as globally. The mechanism was put in place from 2005 by internally synergizing human resource talents, technology and systems to make the university more sensitive to the educational needs of its clientele as well as networking through memorandums of understanding/agreement signed between USM and worldwide partners.

Back in 2005, with 36 years of experience of academic excellence, USM decided to break away from its traditional role to embark on a more worldly cause of sustainable development, both locally and globally. Through teaching and research programmes, USM has not only developed local students for the needs of the nation but as fully functional world citizens. Conversely, today in 2025 USM opens its doors via technology-assisted pedagogical modes to global citizenry to benefit from world-class programmes geared towards their particular needs. Presently, academicians adopt a full-blown *technology* approach whereby they fully synthesize technology with pedagogy in delivering education to their worldwide clients. As such, USM is able to offer education A' la Carte, anywhere any time to meet the traditional and conventional requirements of her customers. Adopting the A' la Carte University concept, USM employs the latest teaching technologies to become a major provider of tertiary and quaternary education as the premier educational institution in the Southeast Asia region.

3.2. The Invisible University

Metaphor: "The university is accessible to everyone, everywhere or anytime"
   Myth: places value on unlimited knowledge being free and accessibility to everyone.

In 2025, USM as The Invisible University is an environment where no formal physical learning environment of the past exists. Its new cultural philosophy highlights the notion that one could seek education without being physically present at a certain place, a certain time, with any particular instructor. This philosophy replaces the myth "that "face-to-face learning is more effective". Instead, learners, as digital natives, are bestowed with interactive, dynamic and adaptable resources.

The concept of the Invisible University as it is known today saw its gradual development based on the technology-based trends appearing since the invention of the Web and internet proliferation became a great enabler of human learning, providing access to shared knowledge everywhere any time.

Particular trends in the past drive the emergence of this scenario. Of significance is the Open Source Models which exemplify the true essence of education: knowledge for all and everyone collaborates and builds on prior knowledge. This is the alternative accessibility economic model for public good: any programmer could read, redistribute, and modify the source code for a piece of software, which could evolve and improve at astonishing speed.

Other trends include the Simputer Project which provides low-cost computing facilities to bridge the digital divide, especially in rural areas and in third world countries; the Gutenberg Project which allows archives of literature in digital format freely available to the public; MIT Open Course Ware which offered all their course materials on the Web for free to self-learners; third Generation Mobile Network (3G)/Global Positioning System (GPS)/Radio Frequency Identification (RFID), WiMax – wireless and mobile technology for anytime, everywhere data mining, analysis and information accessibility.

This university presents an opportunity for life-long learning combined with supported open learning systems, as espoused by the 'open universities' concept in the early days. USM's educational programmes offer worldwide accessibility to self-directed learners, at their own pace and time, on a continuous basis. As such, in 2025, the progressive learning culture marks a shift from the traditional spoon-feeding learning environment of 2005. In 2025 self-motivated, life-long learners possess the desired literacy and numeric skills and positive attitudes towards learning.

Academicians are highly engaged in applying high-technology tools as part of teaching-learning. A common phenomenon is webcasting of lectures live. The recordings are archived for any time, everywhere access. Students can choose to "miss lectures" and study at their own pace from any location. Role-playing simulation is the dominant and preferred pedagogy. Hardcopies (commonly known as 'books' in the past) will be irrelevant and/or obsolete. These will be replaced by e-paper and e-books with interactive dynamic content. In Massively Multiplayer Online Role-Playing Games (MMORPGs), several thousand (even up to 100,000) players may simultaneously play an online game.

Research initiatives manifest through virtual collaborative collective world. In 2005, USM was already actively involved in several research collaboration projects in the Asia Pacific Region through GRID[3] computing and Internet2.[4] Since then, the choice of tapping into what high technology could offer became more crucial for the university.

3.3. The Corporate University

Metaphor: ''Competitive spirit rules the world''
    Myth: places value on the development of enterprising scholars.

In the year 2025, USM would be a completely corporatised university known as ''USM Inc''. The new culture thrives on the competitive spirit flourishing within the academic community. Enterprising academicians who believe in the profit-motive of the university represent intellectuals who believe in the ''survival of the fittest'' mentality. The notion and purpose of knowledge creation and knowledge sharing is redefined and renegotiated in order to fit the aspirations and needs of a privately funded institution. The priorities for good corporate management have renegotiated a value which was once sacred to the academics ''education for knowledge-sake''.

Its journey towards corporatisation started in 2008, when after much consideration of the increasing costs of funding public tertiary education, the Prime Minister's budget speech announced a liberalisation of public universities which entailed the gradual self-funding of universities, with new structures of ownership, governance and management.

The evolution towards a corporate university sparked debates between progressive and conservative academics as USM began reexamining irrelevant ''non-market'' driven courses. Academic freedom to teach what, how and when was to be circumvented by financial and market considerations.

The Corporate University is a company which has been entrusted with the provision of higher education, research and development and whose corporate governance policies include one that distinctly specifies that all its activities shall be directed towards the greater good of the nation. It is to do this without undue and unfair dependence on government largesse for funding its public obligations to bring the best forms of education to the community using the profits from the private aspects of its business operations.

USM is autonomous, privately funded, and independent. Nevertheless, it is also highly regulated by authorities – the outcome of full privatisation of public universities. However, quality is assured by private accreditation bodies.

The Corporate University would follow the structure of a large company entirely free from government subsidies and control. Such a corporate university would owe its success to the fact that its CEO is basically a fund raising machine who does not interfere in the academic field. That would be left very much to the academics who have the power, through a collective voice, in the hiring and firing of colleagues.

The government will derive revenue from the new corporate universities through the payment of fees for land, infrastructure and other facilities which shall remain in the domain of public ownership and by taxing the income and profits of these corporate universities.

3.4. The State University

Metaphor: ''Strategic alliances is the order of the day''
    Myth: places value on the development of enterprising scholars.

In 2025, USM is a teaching-research university which thrives through strong collaboration with industries, specifically transnational corporations, most of them which are based in the Asia-Pacific and the state government of Penang. As a private institution, it receives funding from non-government sources, especially the businesses established within the state. The trend of increasing involvement of the state government in the agenda of industrialization, peaked in the last decade. This situation, combined with the university's prioritization of commercialisation of its research and development (R&D) and the Ministry of Higher Education's encouragement for establishing successful field-dedicated universities, have led to the evolution of USM into the State University. Currently, USM is the designated centre for government (state) initiative on renewable energy sources. This centre has received Malaysian Ringgit 15 million from various funding sources.

A productive corporate-like environment permeates the work culture of the academicians. With the aid of high-tech gadgets, research teams are in constant communication with top leadership of international firms overseas and vice versa, following up new product design project opportunities or progress of current collaborations where USM heads in the main design teams. Academicians sit as nominees on the board of directors of leading established companies. Altogether, USM has

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[3] GRID computing, a single destination site for large-scale, nonprofit research projects of global significance, encourage the sharing of under-utilised computing technology. With the participation of over three million devices worldwide, such projects like Cancer Research, Anthrax Research, Smallpox Research and the Human Proteome Folding Project have achieved record levels of processing speed and success.

[4] Internet2 is a collaboration between more than 200 universities, industry and government to develop and deploy "advanced network applications and technologies for research and higher education, accelerating the creation of tomorrow's Internet".

a total of 85 nominated directors on companies, many of them listed, as a result of the licensing and sales of USM intellectual property (IP) in exchange for equity and seats of board of directors.

The learning environment showcases talented academicians with specialized skills, many of whom are competent at handling both various consulting projects. They are responsive to the needs of high-flying intelligent and self-motivated executives and professionals who commit to various types of flexible full-degree academic programmes, including part-time, sandwiched, advanced diploma, and training stint with in-house academic facilitator at the workplace. Face-to-face and virtual learning are efficiently and effectively combined to provide the best support for the needs of these executives.

The corporate culture permeates the social setting where rounds of golf with corporate associated are a normal phenomenon for USM academicians. Within the university environment, executives and professionals enjoy the vibrant rich and comfortable social setting made available: the university gymnasium as well as conducive dining environments for informal discussions before class sessions.

3.5. The University in the Garden

Metaphor: "An idea factory which continuously develop trans-disciplinary talents"
 Myth: places value on academic freedom and the ultimate pursuit for truth and knowledge that is independent of external sources.

The year 2025 celebrates the fifth year that Malaysia has achieved a developed country status. It can look back at its successes in overcoming the worst effects of globalisation and surviving the many attempts at world hegemony by different powers from different parts of the globe. In this struggle, Malaysians have time and again drawn upon their past history and traditions to guide them through tough and often tumultuous times. With some pride, Malaysians can say that their success has been because they have relied on the three pillars of their society: the continuity of the social compact of racial, ethnic and religious harmony and tolerance; the resilience of the partnership forged between government, businesses and civil society; and finally the sustainability of the common and shared values cherished by all members of the community, especially the need to balance the demands of modernity with tradition, to guide them to the next century.

Existing within this external context, the University in the Garden is an autonomous university model that differentiates itself from the "standardised education" of the past with its prepackaged, stereotyped delivery system. While this latter type of delivery system was perceived as "efficient" and "cost-effective", it was hardly a system that promoted the creativity and uniqueness which is the sought-after talent to compete in today's environment. The University in the Garden is a fitting image held by the intellectual community of their University of the Future. It allows for the flowering of minds in a garden environment that recognizes that every individual is unique and has talents that must be allowed to develop with a minimum of constraints. The University is likened to a big tree of knowledge whose roots are continuously nurtured by dedicated and committed teaching professionals and whose branches represent the holistic development of young minds without abandoning their interconnectedness with nature in a sustainable way.

Unlike the past, graduates today are thinkers and more entrepreneurial, thus enabling them to be more employable or otherwise able to create their own career paths. In other words, the hidden talents and the undiscovered gems referred to by the Prime Minister, some 20 years ago, have been fully nurtured and polished through the new higher education policy that allows greater academic and intellectual autonomy. In fact Malaysian graduates today are in high demand globally. Coming from a society that is truly multicultural and multi-religious, the graduates have taken a globalised character which is simultaneously enhanced by the new higher education system. Malaysian graduates are now able to not only preserve their unique identity but also to "brand" themselves as the preferred choice for employment and partnership. Progress has come at a cost to both country and people. This is very clearly seen in the field of higher education. The drive towards the "McDonaldisation" of higher education meant that the delivery, content and the very substance of education has become standardised and commodified. The resulting robotic mindset stifles creativity and creates the phenomenon of pseudo-intellectuals and unemployable graduates.

The intellectual environment was therefore in a state of deep ferment. Against this backdrop of decline, the educational leadership dared to think the unthinkable and called for more participatory governance within universities, a return to shared values and the introduction of a holistic-based education system. Their ultimate objective was to make the university once again, an institution of higher education that is autonomous, accountable and sustainable – Nature is the base and ecology is the metaphor for learning. USM is an abode of learning valued for its own sake to endow individuals with all the intellectual, spiritual and humanistic faculties.

As an emerging knowledge-based nation molded out of the nine challenges of Vision 2020, Malaysia's economic environment too has dramatically changed. The days of low value-added, assembly-line type of industry are gone. Instead, the engine of growth of the nation depends very much on high value-added intellectual capital that is capable of innovative thinking to move the nation up the value chain. This is well-suited to its developed nation status as conceived by the over-arching principles of Malaysia's Vision 2020. The new breed of graduates and citizenry is better suited to play the role of knowledge workers.

This could be gauged from the recent 2025 World Competitiveness Ranking that places Malaysia among the top 10 nations among the economically advanced economies, and among the top five among the newly industrialized ones. This has

much to do with global reach of the country's economy not only in terms of its trading activities and partners worldwide but also due to the quality of home-grown human and intellectual capital involved in the promoting such global connectivity. Graduates of Malaysian institutions of higher learning, together with the economic sectors, are fine tuning the training that they received with the latter getting directly involved in investing the much needed inputs and resources to create a comprehensive R&D culture including building their own niches for marketing and commercialising products and ideas. As a consequence, Malaysia is well recognized as an R&D hub not only for the scientific and technological cutting edge research but also in areas of humanities and social sciences. This is largely because of a USM-led initiative that promotes a trans-disciplinary approach to education, especially in graduate studies. Knowledge is no longer rigidly and artificially compartmentalized, rather it created a "new science" in the original sense of the word "science" as understood from its Latin root *scientas*.

This is also reflected and enhanced in the curriculum at undergraduate levels where students are not bound by the "standardised, prepackaged education" that once was the norm. In this context, academics and to some extent the administrators are also subscribing to the ideas of trans-disciplinarity so that the decisions made with regard to higher education are sensitive to the needs of this approach. So too are the design of spaces and infrastructures that will facilitate trans-disciplinary interactions and discussions thereby contributing to the flowering of minds. Like nature, the trans-disciplinary scheme of things allows for a worldview that is holistic, symbiotic, interdependent, and interconnected in an ecologically sustainable way. According to Henderson [10] trans-disciplinary educational philosophy would require more than one single indicator, unlike the idea of measuring a complex society using only the Gross National Product (GNP) as the indicator. Indeed, USM has developed new indicators of success for universities focused not only on research but on the type of research (focused on the bottom billion) as well on the energy sustainability of universities.

A trans-disciplinary approach will encourage a broader scope of not only intellectual pursuit but more importantly, development of action plans that are more comprehensive and people-oriented rather than technology-oriented. This approach emphasizes the interplay of environmental, economic as well as social factors within the framework of trans-disciplinarity.

Education is only one of the several interplays of factors that impinge on this scenario and in turn is impinged upon by it. Consequently, by adopting a trans-disciplinary approach, the output/outcome that could be derived will not only be more realistic and acceptable, but also creative in many ways.

On part of the government, the autonomy given to universities has also benefited it through providing a vibrant intellectual input from a community of scholars. The universities, no longer being regarded as part of the civil service, will provide many new opportunities for creating a competitive future based on the authority of ideas. This will heighten the trust forged between the university and the government, in particular the Minister of Higher education, which will be playing more of a facilitating and consultative role rather than a regulatory one. This in turn will make intellectual pursuits more attractive and indirectly will invite the best brains to the universities. As a result, research will flourish and the level of scholarship will move up to a level that is internationally recognized.

While providing employment is not the main core business of the university, indirectly the problem of unemployment is no longer an issue because graduates who are educated with the freedom to inquire for the sake of advancing knowledge are a boon to the employers in the public or private sectors. They are indeed the new generation of leaders that have undergone an exciting higher education system that is capable of a flowering of the minds.

4. The preferred vision of higher education

The end outcome of the exercise on scenario alternatives was an understanding of the possible futures ahead for USM as well as the strategies required to realize preferred aspects of the scenarios and avoid the aspects not desired. From probabilities, participants moved to their preferred vision. Through a series of interviews prodding-for-details (wherein the facilitators plays a directive role) as well as creative visualization (wherein individuals with eyes closed imagine their preferred future (using Elise Boulding's [7] methodology) quite detailed characteristics of the future were conjured during the visioning session.

The five alternative scenarios represent an analytic range which describe the nature of the vision in full range, whereas, the preferred vision signifies convergent thinking. Visioning narrows the range of possible futures to the desired future. The preferred vision of USM in 2025 is a learning environment, also known as a 'symbiotically sustainable study space' which encapsulates three key elements: nature, technology and flexibility. Some major characteristics of these elements are:

  (i) university leadership is an enabler of autonomous and scholar-led culture, where contemplation and calmness is the normal day-to-day reality; a global centre of excellence stands amidst the calmness;

 (ii) teaching/research environment is global-in-outreach-deep collaborative environment with industry and civil society exists and multiple sources of funding are a normal occurrence;

(iii) major virtual infrastructures co-exist with face-to-face infrastructures – flexible learning in nature, cafes, unlike traditional classrooms are imagined as part of the future; sustainable green architecture is embedded within face-to-face infrastructures; deep link exists among high technology, urban landscape and green environment;

(iv) flexible human resource policy is present, attracting best talents-academics are consultants with an entrepreneurial spirit;

 (v) advisory and cooperative synergistic relation exists with Ministry of Higher Education; and,

(vi) the idea of heritage (philosophical/values) maintained while modernity thrives – heritage/culture maintained and observed on buildings but high-technology preside within the building.

5. Universiti Sains Malaysia's journey of transformation – the nuts and bolts of implementation

The previous section of this article described the foresight process, the images of the future of higher education from five different, yet complementary perspectives and the preferred vision. It reflected the inner (individual and collective/ organizational) psyche of the Malaysian learning environment – that is, using causal layered analysis, the deep myths and metaphors were foundational in developing the content of the scenarios. Myths and metaphors were not sacrificed for data; and data was not sacrificed for narrative.

Since the scenario exercise, the change process within USM has included tweaking key performance indicators that coincide with (and mold) the preferred vision. Since, 2008, part of the mission of 'transforming higher education for tomorrow', USM has embarked on many projects, in line with major key performance indicators. They include among others creating an eco-hub, green lungs and a carbon-free area environment, establishing a student parliament, technology transfer to the rural bottom billion, establishing a centre for global sustainability studies, mapping 99 sustainability projects, and initiating green electric motorbikes. This transformation can be described in four stages.[5] These stages are often not linear, in the sense that amalgamation, overlapping, splitting, and even reversal of stages may occur together at any one time. Nevertheless, in any organizational transformation, each of the stages may actually manifest the process described below.

5.1. Visioning

At this stage, a re-awakening-orientation-awareness phase ensues. The expected outcome is that all levels are clear about the new direction and conditions, as well as the underlying rationale. At this stage, from the perspective of the causal-layered analysis (CLA) – here seeing CLA as part of understanding implementation – the 'litany' as well as the 'systemic' levels manifest: new projects, events, and statistical data are identified by champions selected by top leadership in concert with structural changes at the appropriate hierarchy of the university

5.2. Contesting

After the awareness of the new vision among members of the university community reaches a level of clarity and as the manifestation of a new culture or the implementation of new projects reaches critical mass, certain groups with entrenched interests interpret these efforts as threats. They do not fully cooperate, or they resist in one form or another. They are the weights identified in the futures triangle process. This stage has entered the third level of CLA ('the discourse analysis') when differing worldviews of stakeholders come into play. However, the contesting forces may not be limited to those in positions of power. Those who feel a certain degree of deprivation, discrimination or frustration may swing towards one side or the other. However, conflicts and differing perspectives are not necessarily destructive, as pressures and tension are normally an integral part of growth and change. Therefore this is a critical stage for action, consultation, persuasion and negotiation. It is crucial that the politics of grievance from disaffected stakeholders be transformed into a politics of aspiration – "Which future do I want?", "Does my future align with the direction of USM?" In terms of strategy for leadership, it is not always necessary to have everyone on board. There will be natural resisters [11] and as Patricia Kelly has argued, "points of resisting" [12]. Instead of battling the resisters, it is better to understand their reasons, find win–win solutions at the points of resistance and then focus on the desired future. In this way the active and the passive adopters of the new future may remain energized and not become caught up in organizational dramas.

5.3. Balancing

At the end of the contestation stage, a new 'balance' will emerge. Nevertheless, this state of 'stability' can only be reached when the forces arrive at some acceptable point of settlement or harmony. This is the process of creating a new equilibrium. These forces at work may not stop being active; however, the outcome of their push and pull energies would bring the university to a new plane. For instance, there may be elements either among the people or in the university procedural structures that are still acting against new efforts pushing towards the preferred vision. The shift occurs when the process changes from chaos or non-functional standstill or non-acceptance by the majority to a state of functioning acceptance. Therefore, this stage of dynamic balancing is probably a shift or a recreation from the original vision of preferred vision. It is a

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[5] The four stages, seen from the perspective of the causal layered analysis (CLA) takes an in-depth view of the future, exploring multiple levels of the future and the trail of the depth leads to the historical story. The levels are: (1) litany: visible and disconnected news events, (2) systemic: social, technological, economic, environmental and political causes, (3) discourse analysis: stakeholders, ideologies, worldviews, and (4) myths and metaphors: stories, legends, and myths of trauma and transcendence. The myths provide the emotional level experience to the worldview under enquiry. The metaphors constitute how we see social reality and are culturally specific and must be derived from how people inside an organization see themselves. CLA here is used to enhance the efficacy of implementation.

result of the contested forces. Unlike a military organization where compliance with executive order is generally the rule, a university has, to a certain degree, an established Dionysian culture[6] which is the antithesis of command and control work ethics. Authoritarian leadership is often rejected in these environments. Intellectuals flock to the university for self expression and autonomy, for peer-to-peer communities. Any direction setting by university leaders needs not only to be inclusive but understanding of the psyches and the narratives of professors. Handy [13] argues that this is due to the fact that academics are Dionysians who view themselves as 'authorities' which the administrative system exists to serve. Administrators, however, see themselves as engaged in the "real work" with academics living in "ivory towers." The CLA process moves the discussion forward by giving voice to these different perspectives and seeking common ground, creating an appreciation of the importance of both these roles (and the role of the student, industry partners, and others). Therefore, finding a balance in a university context is often a negotiated outcome which continues to be dynamic; hence, sowing the seeds for future contestations. To be clear, contesting paradigms managed wisely, need not be destructive but represent a creative force of positive growth and progression.

5.4. Self-direction and externalisation

This is a sphere of influence and of power. At this stage, a new organizational culture has become normalized within the university environment. A new inner metaphor of higher education, the ultimate target for university transformation has been created. It involves a change in the inner world of meaning for various stakeholders that is translated into their priorities, intentions, and actions, that parallel with the 'new myth' (surrounding the core values) imagined by the preferred vision. Known as the fourth level of the CLA, the new myths and metaphors are now consonant with the images of the preferred scenario. The deepest level of transformation of higher education within the university setting then takes place.

Among these stages, while USM stakeholders are familiar with the visioning stage, USM is in transition between the contesting and dynamic equilibrium stage. As the university flows from contestation to a new equilibrium, there are at least six patterns of process disruption that may lead the path of transformation away from the preferred vision. There are namely: (i) energy plateau, (ii) outward leadership migration, (iii) discontinued force, (iv) reinterpretation of vision, (v) emergent power centres, (vi) and contending agendas:

(i) *Energy plateau* – characterized by existence of new groups of 'converts', 'visionaries' and 'practitioners' who are not doing anything new, not adding value, or seeming to be losing enthusiasm;
(ii) *Outward leadership migration* – characterized by champions leaving the university for a number of reasons (e.g. retiring, better job offers);
(iii) *Discontinued force* – characterized by glorified past projects, forgotten cause, transient/temporary/ad-hoc team that disperses after a certain period;
(iv) *Reinterpretation of vision* – characterized by new ideas, new discourse, and new ways being introduced into the process; culture or structure which redefine or re-angle/orientate the path of transformation;
(v) *Emergent power centres* – characterized by newly appointed leaders and groups, or by new emerging groups that which initiate something new and may marginalize the current and 'old' agenda/projects;
(vi) *Contending agendas* – characterized by university facing externally imposed agendas/pressures to channel resources to meet other goals (Competitive agenda); or external forces pushing the university to reduce or abandon its earlier vision and replace it with another vision/goal, often from the top (Conflicting agenda).

In this transition mode, the worldviews and myths of a university culture and its peculiarities, and how they match with the (evolving) preferred vision, need constant evaluation and reflection. As noted earlier, these stages are not necessarily linear and could, in some ways, be dialectical. For this reason, as USM moves into the future and opts for good but not necessarily perfect solutions, the preferred vision would also need to reflect changing contending needs and wants of various stakeholders, internally and externally. It is during this 'trying' transition mode that a collective organizational story is emerging to negotiate change with the outer world.

Finally, as mentioned earlier, USM currently holds the sole Accelerated Programme for Excellence (APEX) university status in Malaysia granted by the Malaysian Ministry of Higher Education. The APEX university status creates a new momentum in the continued innovation process. Where will USM be in 2025? Certainly not where it would have been if it followed the business-as-usual or used future models. The next challenge will be once the current vice-chancellor – the champion of futures and innovation – retires at the end of 2011. However, the VC is not the only champion, there are others who are working on innovation and foresight [14], who are part of the dynamic equilibrium. Will the foresight and innovation process become successfully institutionalized and part of the deep culture at USM such that leadership change does not dramatically influence implementation? Or will the pendulum swing back? Or will innovation create innovation, success create success?

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[6] Handy's Gods of Management discusses that an organization is made up of a mixture of four possible cultures, represented by four Greek gods: Zeus (the club culture), Apollo (the role culture), Athena (the task culture) and Dionysus (the existential culture).

Acknowledgements

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