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Orientation shift? Understanding the 'Third Mission' of the University in Malaysia's Science System

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Orientation shift? Understanding the 'Third Mission' of the University in Malaysia's Science System

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Abstract

The paper examines how the conceptualisation and materialisation of the third mission of the university affect scientific knowledge production in Malaysia. In light of scientific knowledge, the materialisation of the third mission will bring more interactions with respect to production, use, application, and exploitation of knowledge outside academic environments. Think tanks such as the Overseas Development Institute in the UK and Penang Institute in Malaysia are producing scientific knowledge, while engaging in policy advice. They may well have a better strategy in terms of science communication of their scientific knowledge-related outputs due to their organisational orientation. Nevertheless, scientific knowledge is a type of knowledge that is often assigned to university as a knowledge-producing organisation. In Malaysia, currently there is a transformation of higher education which is pushed, at least to some extent, by the National Higher Education Strategic Plan (PSPTN) 2007-2020. The strategic plan envisages, *inter alia*, internationalisation of higher education in Malaysia. Fieldwork in Malaysia in 2015 and 2016 shows how key performance indicators are vital for researchers and lecturers in universities. In addition to the indicators, consultancy and service to university and community are criteria for promotion of lecturers and senior lecturers. Indeed, there have been scholarly contributions with regard to the role of universities in terms of the triple helix innovation, science policy, and transnational higher education in Malaysia. The proposed paper builds further from these studies by asking how does the third mission in Malaysia affect scientific knowledge production at the university? The paper will offer empirical findings from qualitative fieldwork carried out in two universities located in Penang, Malaysia in 2015. In-depth interviews with lecturers and senior lecturers were conducted in 2015. In addition to the interviews, data analysis was carried out using documents and government reports from 2011-2017.

Keywords: science system, scientific knowledge production, Penang, Malaysia, third mission

1 Introduction

The variety of roles ascribed to universities has given rise to the idea of the *third mission*: i.e. the recognition that universities have functions beyond research and teaching that relate to their wider economic, social, and civic role (Harloe and Perry 2004).[1] This paper examines how the materialisation of the third mission (TM) of the university affects knowledge production in Malaysia's science system.

As Slaughter and Leslie (1997) suggested, globalisation has affected four major changes to higher education: the constriction of public funds for the sector; the pre-eminence of market-related disciplines; a closer relationship between multinational corporations and state agencies, including universities and other academic institutions; and an increased focus on global intellectual property strategies by multinationals and industrial countries (pp. 36–37). The paper here focuses on how the third mission brings about social change to the science system in Malaysia.

Science is deeply integrated in the fabric of modern societies and economies (De La Mothe 2001, Tayeb 2018). It lies at the heart of decisions about the environment, health, welfare and security (Stehr 1998, Weinstein and Stehr 1999). Science can contribute to societal transformation, and, therefore, through its close relationship with science, the university can also play a key role in that transformation. To build a knowledge-based economy, Malaysia pursues the capitalisation of knowledge through Malaysia 2020 Vision, the creation of different corridors (Multimedia Corridor, Northern Corridor). Indonesia pursues it differently: it sees the importance of large capital infrastructure development and clusters development in taking advantage of knowledge. This paper furthers previous studies on the sociology of knowledge (Gerke, Evers et al. 2008, Grundmann and Stehr 2012, Purwaningrum 2017) and the role of the university in a national science system (Harloe and Perry 2004, Pinheiro 2012). The main research question is: *What are the ways in which the third mission (TM) affects knowledge production within universities amidst the autonomy of Malaysia's academic organisations*?

The paper is an empirical inquiry into social change caused by the ways a third mission manifests in terms of knowledge collaboration in two universities in Malaysia. It is structured into several sections. The following (second) section discusses science and the university's third mission. The third section examines the orientation shift towards increasing autonomy. The next section lays out the framework for the analysis and fieldwork that was conducted. Sections five and six are empirical sections investigating two universities: one, Tunku Abdul Rahman University College (TARUC), is a private university, and the other, Universiti Sains Malaysia, is a public research university. The last section sums up the discussion.

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[1] See also Julian Kirchherr, "A PhD should be about improving society, not chasing academic kudos," *The Guardian*, 9 August 2018: https://www.theguardian.com/higher-education-network/2018/aug/09/a-phd-should-be-about-improving-society-not-chasing-academic-kudos (accessed on 2 February 2020).

2 A Literature Review: Science and the University's Third Mission

The idea of a university's *third mission* infers that such an establishment shoulders a first and second mission. Conceptually, the first mission refers to traditional teaching. Looking back at Cambridge University in the eighteenth century, Charles Brink (who had held a Chair of Classics) stimulated the production of new knowledge in teaching by sponsoring a new Latin course that rejected traditional grammatical terminology (Stray 2016 p. 7). As an illustration, the Humboldtian university was set up to educate those from the aristocracy and educated middle class elites in scholarly methods (Charle 2004). Such emphasis on the importance of teaching within the university was linked to 'academic freedom'. The content of the teaching, the university's links with the authorities and the manner of study were characterised by 'freedom' (Ruegg 2004 p.33). It was Wilhelm von Humboldt who coined that the state had liminal tasks regarding universities, namely to appoint professors and to protect their freedom. Teaching is intricately linked to academic freedom. This is true even in countries with strong ideological systems in place, such as Indonesia and Brunei Darussalam where – though teaching materials may be subject to screening, and there is a conscious yet implicit understanding that, for instance, there will be an avoidance of conflict with 'Malay, Islamic, Monarchy' ideology in teaching a classroom module – students' learning may often take place outside the classroom. Brunei Darussalam, for instance, has *kopitiam* (coffee shops) that serve as meeting points for the sharing of knowledge amongst ICT knowledge workers in Anggerek Desa (Purwaningrum 2017). As sites of knowledge sharing and learning outside university, coffee shops deserve attention; a Malay study of coffee shops as domains in Singapore demonstrates how they played a considerable part in the making of civil societies and in democratising the link between the people and the state (Aljunied 2014 p. 82).

The second mission is linked to research carried out by lecturers and professors in the university. In 1810, the Prussian university system, established by Humboldt, was very much against the Napoleonic University Model (Charle 2004). Humboldt's model was intended to incorporate seminars led by lecturers promoting research-based study and, thus, showed the importance of research for the professors' teaching (Charle, 2004). As the system exists today, research groups or reading groups are linked to learned societies and university. Chairs held by professors or associate professors are commonly found in university, though the Max Planck Research Institute also has chairs. The University of Sydney's 'Past and Present' reading group, which meets each semester to hold a discussion about a new book, is an example of the second mission, as a research and reading group may actively produce knowledge through their epistemic activities. In some of the sessions, the discussion may give rise to a new article being produced. The second mission is, thus, linked to research activities.

A variety of roles are ascribed to universities and have given rise to the idea of the TM: the recognition that universities have functions beyond research and teaching that relate to their wider economic, social and civic roles (Harloe and Perry 2004). The TM, in its broad meaning, refers to the changing roles and functions of universities which, as demonstrated in the following section, have always been a subject of debate amongst academics and society at large (Castells, 2001 as cited in Pinheiro, Langa et al. 2015b). Laredo (2007) added that the TM is a highly ambiguous concept that is dependent upon three interrelated aspects: (1) the configuration of a given university's specific activities: (2) its degree of territorial or geographic embeddedness, and (3) the national (and we would add regional and global, e.g., Nordics and EU) institutional framework(s) in which it operates.[2] For clarity's sake, Laredo ([2007](#))

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[2] For the European idea of a „third mission," one can refer to the 1988 Magna Charta Universitatum. The overarching objective of the document is to bring the citizens of EU closer through the higher education sector and affirm the central role of universities in developing the ever-changing society: http://www.magna-charta.org/resources/files/the-magna-charta/english (accessed on 2 February 2020).

identified three key functions whereby it is possible for the TM to be re-categorised. The first is educating the masses, the second is professional training and/or specialised research, and the third is academic training and basic research.

There are inherent tensions in the concept of the third mission. It is a cultural concept, as coined by Inga Ulnicane, an academic in Vienna. The concept can be fluid and shifting, though efforts to instil indicators can measure how the third mission can keep track of its implementation and see, for instance, that TM differs from corporate social responsibility. Additionally, different academic communities and knowledge domains have varying conceptions of what *relevance* or *social impact* the third mission entails (Langa 2010).

The TM carries several conceptual underpinnings. One way to approach the third mission is in terms of indicators. From a policy perspective, Molas-Gallard and Martinez investigated the development of third-mission indicators as part of the larger environment, whereby policies are conceptualised and applied. They argued that the development of third-mission indicators has become a substantial part of the application of third-mission policies (Molas-Gallard and Castro-Martinez 2007). Third-mission indicators are part and parcel of science and technology indicators ascribed to a university by a professional organisation. These indicators allow appraisals of how far a university has succeeded in conducting third-mission activities, on the one hand, and affecting social change, on the other.

The next concern is the university's accrual of economic benefits related to its third-mission activities. One method through which a university can benefit economically is *technology transfer*, which can be conducted by means of licensing intellectual property rights (IPR) (Meyer and Tang 2007). There are two diverging views on technology transfer. The first is a view that sees the mediation of transfer of technology with or without the market, whilst the second is a view that captures the process of technology transfer as linear. For the former, market-based technology transfer is associated with foreign direct investment, technology licensing agreements, the import of capital goods, foreign education and training, turnkey plants and technical consultancies. Non-market-based technology transfer includes technical assistance, copying or reverse engineering, information from trade journals and technical information services (Thee 2005 p. 216). For the latter, the process of knowledge flow is viewed as linear. Donald Stokes (Stokes 1997 p. 10) traces the usage of the term as it was associated with the technological sequence from basic science to technology. This linearity is problematic within the study of sociology (of knowledge). Gibbons et al. (1994) assert that knowledge flow processes are not linear; they are non-linear in character. Universities are frequently described as drivers for value creations (Amesse and Cohendet 2001). For instance, the UK's Department of Trade and Industry viewed British universities as 'major agents of economic growth' in a 2000 White Paper on science and innovation (DTI, 2000: 27, as cited by Molas-Gallard and Castro-Martinez, 2007).   However, this involves far more than universities simply housing technology transfer offices. There are, in fact, three distinct sources of revenue that universities can access: the first is funds received from governmental research councils to support research. The second is core funds from the public that universities receive to support teaching-related responsibilities. The third covers other forms of financial support including, for example, donations, both from students and the private sector (Clark 1998).

Another source concerns engagement with actors and regional-political developments. One theory, the *triple helix* approach, is that universities can play an improved role in innovation within an increasingly knowledge-based society (Etzkowitz and Leydesdorff 2000). Scholars have attempted to expand the triple helix theory to a *quadruple helix* (Carayannis and Campbell 2009, Carayannis and Campbell 2010), adding that the fourth helix represents media and culture-based public media/creative industries/culture and/or lifestyles. The quadruple helix refers to structures and processes of the *glocal* knowledge economy and society, resting on 'multi-level systems of knowledge'

(Carayannis and Campbell 2009).[3] In retrospect, university's engagement with actors is different from simple social outreach. In a professional and capacity-building organisation such as a university, workers – in this case academics – can be seen operating within a civil-society framework. It is claimed that the *Bersih* movement[4] in Malaysia is the most sustained protest movement in the region's history (Khoo 2016). A number of academics, as active citizens, took part in the movement. Similarly, university campuses became 'temporary safe havens' during the 1998 *reformasi* movement in Indonesia. 'Petrus' shooters would not be found on these campuses throughout urban areas in Indonesia. During the *reformasi* movement, senior academics in Indonesia, such as Amien Rais (a Gadjah Mada University professor), voiced stern criticism of the authoritarian regime of Soeharto.

Universities can also participate in engaged scholarship by conducting a more inclusive academics recruitment practice targeted at disadvantaged social groups. An example in Australia is the targeted recruitment of indigenous peoples in universities, such as at the Deakin Institute of Koorie Education at Deakin University. In its 2017 recruitment drive for lecturers, the university only accepted applications from those who identify as Aboriginals or Torres Strait Islanders. This is in line with the special measure provisions stipulated in the Victorian Equal Opportunity Act of 2010. Such special measures, or affirmative actions, are in accordance with Australia's *Closing the Gap* policy. In the context of Malaysia, *Aboriginal People*, or *Orang Asli*, are divided into 3 different ethnic groups – the Negritos, the Senoi and the Proto-Malays (Zawawi 2000). Orang Asli are considered as Bumiputeras, like the Malays: nonetheless, they are subject to different laws, particularly those regarding land, and are also under the custody of the JHEOA (the Department of Aboriginal Affairs) (Ibrahim 2016) (Zawawi 2016). University can also take an active role in engaged scholarship. An active production of knowledge that takes into account engaged scholarship can be seen in feminist-methodology-informed research. In this research, one guiding principle is an emphasis on the empowerment of women and transformation of patriarchal social institutions by means of research and research outputs (Fonow and Cook, 2005 as cited in Purwaningrum and Shtaltovna 2017). Social change is thus a key message brought about in this engaged scholarship. Production of scientific knowledge and engaged scholarship is essential to opening up a university's purpose. Indeed, the circulation of knowledge and the flourishing of diverse ideas, as well as the promotion of critical scholarship, require dialogue and the inclusive participation of academics, particularly those coming from disadvantaged groups.

How does engaged scholarship produce knowledge? And most importantly, how does the transgression of boundaries in science affect knowledge production? In the co-evolutionary framework, this boundary transgression and engaged scholarship brings about a new mode of knowledge production. Mode 1 comprises the traditional disciplinary scholarship of discipline-based knowledge production. It discerns between that of fundamental and applied knowledge. The produced knowledge is authenticated through the sanction of a clearly defined community of experts/specialists in accordance with their discipline (Gibbons, et al. 1994, p. 22). Knowledge production is, thus, discipline-based. In Mode 2, there is a movement beyond the structure delineated by the boundary of the discipline within the constitution of an intellectual agenda. This shift consists of the manner in which resources are utilised, the means by which research is organised, the communication (of research) and the evaluation of the results (Gibbons, Limoges et al. 1994).

Increasingly, within the dynamics of Mode-2 knowledge production, there are individuals involved in

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[3] Two axes exist: the spatial axis, consisting of different levels of spatial axes working at varying levels of spatial aggregation, and non-spatial geographic metaphors, namely education and research (Carayannis and Campbell, 2009: 214).

[4] *Bersih* is a coalition of civil society organisations and opposition political parties that spearheads a mass movement pushing for electoral reforms in Malaysia. The *Bersih* movement started small in 2007 but gained momentum and stronger public support from 2011 onward, resulting in more than 100,000 people taking to the streets to demand clean and fair elections. The former BN government ended up adopting some of *Bersih*'s demands such as using indelible ink at polling stations and allowing Malaysians living abroad to cast absentee votes.

the genesis of knowledge who remain socially distributed (see Gibbons, Limoges et al. 1994, pp. 11–14). Consequently, a heterogonous growth of knowledge exists, where communication assumes a central role. There is also the breaking-down of older delineation lines and the separation of partition, for example, between universities and industry. The combination of norms and values in different parts of society is an element of the process of diffusion. This also enables further communication by way of the manufacturing of a similar culture and language. Hybridisation[5] is an illustration of an output of Mode-2 knowledge production.

Ultimately, the argument proposed by Gibbons et al. (1994) is that the parallel expansion of potential knowledge producers combined with the growing requirements of specialist knowledge are producing conditions for the birth of a new mode of knowledge production. Their argument follows a co-evolutionary framework, whereby a structure for re-thinking science is offered (Nowotny, Gibbons et al. 2001). They argue that the emergence of a more open system of knowledge production, as evidenced in Mode-2 science and Mode-2 society, is a phenomenon associated with a co-evolutionary process. Next, contextualising science is enabled through a process of *reverse communication*. It is this process of reverse communication that transforms science. Furthermore, the process of contextualisation shifts science beyond reliable knowledge to the creation of more socially robust knowledge.

Three critiques can be mapped from details outlined in the co-evolutionary framework. First is that the typology of knowledge discussed seems to be exclusively tied to the science system. A strong knowledge base, however, calls for different kinds of knowledge, including scientific as well as, for example, local knowledge. How are the shifts in the practice of science dealt with in university as a fundamentally different and evolving organisation? A phenomenological take on these differences would call for investigations on cultural framings of investigated worlds, of research (practice and results) and the changing symbolic meanings of *science* and *nature* (Pickstone 2006 p. 119). Second is a structural critique of Mode 1. One definition was coined by Dominique Pestre, a French science historian, who contended that Mode 1 could not be accepted as an accurate characterisation of the knowledge economy in the West since the sixteenth century. He offered a more structural tone in alluding that 'knowledge has always mattered tremendously to states and to economic elites… Most knowledge producers have always been attentive to the interests of those elites' (Pestre 2003 p. 250). Professionals, such as jurists and sociologists, operate with a distance between them that separates two distinct modes of production and reproduction of knowledge, which, according to Bourdieu, should be understood in the context of a university reflecting itself as the structure of the field (Bourdieu 1984 p. 40-41).

An inquiry into TM and how it affects the production of scientific knowledge does not have to follow either a co-evolutionary framework or complexity theory. Meaning-making and the (science) communication (Rahmat and Purwaningrum 2018) that comes from knowledge production is better understood through a social phenomenological approach (Schutz 1967). The social phenomenological approach could be one alternative for understanding social worlds from within the epistemic community or from within the university itself. For disciplinary boundaries to transgress or shift within a particular epistemic community or disciplinary community, one needs to understand how cultural framings work in practice and how, in cases where there is tension, meanings are lost and replaced. Discursive statements form the basis of disciplinary practice (Keller 2011, Hornidge 2013, Tayeb 2018). For example, a discursive statement in which a senior sociologist tells a junior sociologist that the junior does not belong to the discipline of sociology may hold sway due to the advanced position of the senior

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[5] This hybridisation can be seen as the 'the emergence of new hybrid communities, consisting of people working who have been socialised in different subsystems, disciplines, or working environments, but who subsequently learn different styles of thought, modes of behaviour, knowledge and social competence that originally they did not possess' (Gibbons et al. 1994, 37).

sociologist. Nonetheless, in order for the statement to be a valid assertion, it needs to be backed up with data from the ground and micro-level (Beerkens 2010). There are, in fact, three angles to analysing a university's third mission, and these will be discussed in the coming paragraphs.

The perspective of universities as loosely coupled systems whereby there is a need for increased societal engagement or a third mission is addressed by decoupling core teaching and research activities from non-central tasks (Pinheiro and Trondal 2014, Pinheiro, Langa et al. 2015a, Pinheiro, Langa et al. 2015b). This perspective bears resemblance to the previously described co-evolutionary framework. Another perspective is institutionalisation, described in the special issue of the *European Journal of Higher Education* in 2015. In this perspective, the issue posits a critical assessment of the extent to which the third mission has become an integral part of universities' core structures and primary activities (Olsen 2007 as cited in Pinheiro, Langa et al. 2015b). The third perspective is an innovation system foresight. Piirainen et al. contend that foresight is an exceptionally fruitful input to university's third mission. Within the field of foresight, there is two-track transformation. First, foresight can be defined as applying a systemic and evolutionary understanding of innovation into its concept and applied method. Second, foresight develops more solid theoretical bases as the field shifts from being practice-oriented to one that is academic-discipline-oriented (Piirainen, Amanatidou et al. 2016). The last angle may well be informed by the sociology of knowledge or evolutionary economics. Consequently, from this angle, discussions are centred upon general economic development. It is argued, within the economic framework, that innovation systems compete with each other. Such an understanding will disguise the fact that a transition from peasant society to modern society is still ongoing in countries such as Malaysia and Indonesia. For instance, in a university technology office, one might observe customers or traders seeking advice on the possibility of using a marriage certificate as a fiduciary for a soft loan, simply because they do not have access to land rights/land ownership.

3 Orientation Shift in the Form of Increasing Autonomy?

Studies on university and science policy in Malaysia have made scholarly contributions concerning the role of universities in terms of the triple helix innovation in Malaysia (Azman, Sirat et al. 2014), science policy in Malaysia (Evers and Gerke 2015) (Gerke and Evers, 2015) and transnational higher education in Malaysia (Symaco and Wan 2017). The topic of university's societal engagement in its overall science system in Malaysia is under-researched. An inseparable aspect of social life is autonomy. At the start of the nineteenth century, for example, Oxford and Cambridge reaped the benefits of autonomy because of their wealth and close association with the Anglican Church (Charle, 2004). Autonomy is a university's academic norm (Pinheiro et al., 2015) that is built in due to the fact that its day-to-day function runs in parallel with academic freedom. In contrast to social groups, such as the medical profession, whose scientific knowledge has the capacity to reflexively shape policymaking at a state level (Palmer and Short 2014), autonomy is permeable to socio-political conditions and a state's science policy. Malaysia, according to Mok (2008), subscribes to a market-accelerationist state in which the state attempts to accelerate market forces in order to make the country a regional hub of higher education. Autonomy should be seen in light of overall social changes that also occur due to Malaysia's regulatory regime.

Scholars who work on transnational higher education observe university in relation to changes in globalisation and a government's agenda. Education is seen as a commodity, and thus subject to regulation (McBurnie and Ziguras 2001, Mok 2008, Azman, Sirat et al. 2014). McBurnie & Ziguras (2001), for instance, pinpoint that the government of Malaysia has a clear-cut nation-building agenda that sought to take advantage of international trade and, at the same time, retain its own character. They specify how Malaysia is the only country, alongside Hong Kong and Australia, where the government oversees aspects of the curriculum's compulsory content. When I was conducting my fieldwork in Penang, character-building through compulsory curriculum content was emphasised as vital in the functioning of the Universiti Sains Malaysia (USM) teaching service.

A noteworthy angle is Berkeens' (2010) *global university* model. It can be best described by its terms of openness, relevance and responsiveness. He prescribes such a model from a multitude of studies on universities, such as the innovative university (Clark, 1996), the entrepreneurial university (Etzkowitz and Zhou, C 2008; Clark, 1998), the service university (Buchbinder, 1993; Tjeldvoll, 1997; Cummings 1998 as cited in Berkeens, 2012), the stakeholder university (Jongbloed and Goedegebuure, 2001, as cited in Beerkens, 2012) and the responsive university (Tierney, 1998 as cited in Berkeens, 2012).

Another model used to describe higher education in Malaysia is a *hybrid university*. Malaysian universities can be viewed as hybrid universities: there are plenty of policies and practices found in these universities that are distinct from Western-academic-model origins (Lee, Wan et al. 2017a, Lee, Sirat et al. 2017b). Lee et al. (2017a) argue that the indigenisation of the Western models has materialised in the form of hybridity arising in various aspects of Malaysian university's' social life: the teaching-learning context, programmes and curriculum, governance and management.

One typology of knowledge that can have a transgressive capacity is scientific knowledge. Looking outside university, think tanks (such as the Penang Institute in Malaysia or the Lowy Institute in Australia) are also producing scientific knowledge. They may well have a better strategy in terms of communication of their scientific-knowledge-related outputs due to their organisational orientation. Nevertheless, scientific knowledge is a type of knowledge that is often assigned to university as a knowledge-producing organisation.

The Education Act 1961 was enacted in Malaysia: historically, the policies were made after embracing recommendations by several education review committees and by observing the British colonial era's fragmented education policies (Zakaria 2000). By 1969, policymakers in Malaysia were discussing autonomy. A committee commissioned by the Cabinet also backed up the idea of academic freedom in relation to society and the Government. This is shown in the following excerpt of a speech delivered by Hussein Onn, the Minister of Education in Dewan Rakyat:

> When an autonomous institution is mainly dependent for its income not on the fees of pupils, nor on private endowments, but on subventions from the State, how far should it have independent powers of initiative and final decision? Such a position of material dependence is in fact today the position of the University of Malaya. So far in the history of this country, the activities of the University of Malaya have been remarkably immune from interference or control by the Government. Even though the growing financial needs of that University have increasingly resulted in the Government providing both recurrent and capital grants, exceptional care has been taken by Government to see that these subventions are made in a way that involves the minimum of interference with the policy of the University. … It must, however, be said that in the determination of the aggregate amount to be spent from public funds, the Government necessarily has the last word, and a wise university naturally wants to take into account the Government's responsibility for national development and for a fair and equitable distribution of the country's wealth among all sections of the community. Subject to this, we believe that academic freedom is a necessary condition of the highest efficiency and the proper progress of academic institutions, and that encroachments upon their liberty, in the supposed interest of greater efficiency, would in fact diminish their efficiency and stultify their development (Suffan, 1969, p. 2 as cited in Wan 2017 p. 5-6)

The racial riot propelled universities to fall under the remit of the Emergency (Essential Powers) Ordinance No. 74 in 1971 – the Ordinance was then superseded by the University and University Colleges Act 1971 (Wan 2017). The racial riot was a formative event that brought about change in policy. In a different yet more macro tone, Morshidi Sirat, a Malaysian geographer, declared that the New Economic Policy (NEP) in 1970 brought about the advent of the University and University Colleges Act in 1971: the latter is an important instrument enabling State-centrism and intervention in the running of State-controlled higher education institutions (2010). The backdrop to this NEP was that following the racial riots, the United Malays National Organisation (UMNO)-led government started to apply preferential policies in favour of the Malays, under the aegis of the NEP, to further their socio-economic mobility by invoking its political dominance within the coalition government (Sua and Santhiram 2017). Education, and opportunities to work as a professional in the higher education sector, allows the possibility of upward mobility in a class sense and, additionally, in the circulation of ideas. Preferential treatment and a quota treatment favouring Malays in Malaysia would essentially mean that other ethnic groups had been excluded from the higher education sector. The logic behind this policy is the historical backdrop of relative socio-economic and educational deprivation related to the implementation of a *divide et impera* policy that the British colonisers had imposed and to address the problem of Malays lagging behind the non-Malays during the post-independence period (Sua & Santhiram, 2017). Furthermore, as explained previously, the formative event of the 1969 racial riots prompted the quota treatment, including an ethnic quota system of admission to public university giving preference to the Malays (Sua & Santhiram, 2017). According to Wan, meritocracy had replaced the quota policy in 2001 (Wan, 2007). Nonetheless, the practice of true meritocracy was not to materialise, as there continued to be two means of access to public universities (Sato as cited in Wan 2007).

An affirmative policy favouring Malays' mobility can be seen in the establishment of MARA. An entity which transformed from the Rural Industrial Development Agency (RIDA) in 1956, MARA has been actively involved in providing the Malays more access to higher education since the 1960s (Sua &

Santhiram, 2017). MARA Institute of Technology (*Institut Teknologi* MARA, or ITM) was set up in 1967, particularly for higher education, following expansion in the number of courses and students (Wong and Ee, 1971, as cited in Sua and Santhiram, 2017). ITM was modernised into a university 32 years later; namely, the MARA University of Technology (*Universiti Teknologi* MARA, or UiTM). Consequently, with regard to university autonomy, a limited model unfolds whereby a form of academic freedom has been carried, cognisant of norms and politics favouring the Malay ethnic group.

In Malaysia, from the 1960s to the 1980s, public universities were controlled mainly by the State: the government set the student intake guidelines and regulations on financial and budget matters (Sirat, 2010). In the late nineties, Malaysia leaned towards quasi-marketisation and the marketisation of higher education (Sirat, 2010; see also Beerkens, 2010; Mok 2010). The 1996 Education Act effectively liberalised the higher education sector in Malaysia by establishing more public universities and opening up the higher education landscape to private institutions. The higher education sector started to ramp up efforts to enrol more students, especially foreigners, to fill in the seats at these new universities and university colleges. It was the advent of the internationalisation of higher education in Malaysia.

The internationalisation of higher education adds more nuance in providing what autonomy means at an organisational level in Malaysia's higher education sector. Currently, there is a transformation of higher education being pushed, at least at a normative level, by the National Higher Education Strategic Plan (PSPTN) 2007–2020 (Azman, Sirat et al. 2014). The strategic plan envisages, *inter alia*, the internationalisation of higher education in Malaysia. Fieldwork in Malaysia in 2015 and 2016 shows how key performance indicators are vital for researchers and lecturers at public universities. In addition to the indicators, consultancy and services to the university and community represent criteria for lecturers' and senior lecturers' promotion. The internationalisation and, subsequently, transformation of higher education creates more autonomy for Malaysian universities in accrediting and appraising the accomplishments of its academics according to key performance indicators (KPI). The KPI are as follows: number of publications, number of citations, income generations (through research grants, among others), graduates employability, students attrition rate, intake graduate-on-time rate, number of international students, and Quacquarelli Symonds Limited (QS) World University Rankings[6].

Autonomy is also propelled by the increasing corporatisation of universities in Malaysia and globally (Jackson 2017). In this vein, the State is taking up a market-accelerationist state (Mok, 2008). The 1990s witnessed universities in Malaysia welcoming the corporatisation of public universities (Sirat 2010). Using Universiti Sains Malaysia (USM) as a case study, Lee (2004) shows how public universities were mainly 'corporatised by governance' instead of being corporatised by finance. In January 1998, University of Malaya, the oldest university in the region, was corporatised along with eight other public universities in the country (Mok, 2008). Two points stand out with regard to increasing autonomy in Malaysia: first is that local public university can franchise degree programmes. A report published in 2002 by the Commonwealth of Learning and UNESCO states that University Utara Malaysia, University Kebangsaan Malaysia, University Teknologi Malaysia and Universiti Sains Malaysia franchised their programmes to local private colleges (Middlehurst and Woodfield, 2004, as cited in Mok, 2010, p. 428). This trend may show that public universities are becoming more entrepreneurial. Second, it has been argued that the following elements play a very important part in the appointment and promotion of academics in the Malaysia campus: personal relations, ethnic origins and at times, political affiliation (Lee, Sirat et al. 2017b). This trend, in contrast to the first, would limit the bestowal of full autonomy to universities. Generally, university staff remain civil servants and universities still have to go to central agencies with regard to appointments (Beerkens, 2010).

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[6] See the following webpage for a list of key performance indicators: https://www.kpims.usm.my/v3/?p=what-is-headline-kpi

A different account of full liberalisation currently in practice is the case of universities located within the Educity at Iskandar Malaysia region. As of 30 September 2013, eight international branch campuses have been established in the country: Monash University Sunway Campus Malaysia (1998), Curtin University of Technology Sarawak (1999), University of Nottingham Malaysia Campus (2000), Swinburne University of Technology Sarawak (2001), Newcastle University Medicine Malaysia (2011), University of Southampton Malaysia Campus (2011), Heriot-Watt University Malaysia (2012) and University of Reading Malaysia (2013) (Department of Higher Education, Ministry of Education Malaysia 2013 as cited in Aziz and Abdulllah 2014).

4 Research Methods: Meso-Micro Approach

The research is an empirical study informed by a meso-micro approach in sociology and phenomenology (Schuetz, 1967). The former is explained by the fact that the research is located in Penang, Malaysia, in 2015. The micro refers to two academic organisations in Penang. One is Tunku Abdul Rahman University College (TARUC) and the other is the Universiti Sains Malaysia (USM). TARUC is a private university outside of the Accelerated Programme for Excellence (*APEX*) tag given to public research universities in Malaysia. Private higher education institutions play a key complementary role in providing an alternative choice for students to pursue higher education; admission to these schools comes with a higher tuition fee but less competition (Wan 2017). USM, by contrast, is a public research university that was established after the University of Malaya in a location that was designated as a port city. It is a member of APEX universities in Malaysia. By covering both private and public universities at a micro level, we wish to capture the social realities of how an orientation shift of giving more autonomy to university affects third mission realisation in knowledge production and exchange. Our units of analysis are these two organisations: TARUC and USM, as well as individuals working in the two organisations. Furthermore, an additional justification for the choice of the two organisations is that both are located in Penang, Malaysia.

Phenomenology was used in our study as a theoretical approach to capture meaning-making (Hornidge 2013) in disciplinary knowledge production. We had asked (as did our research assistants) how they, in this case, the academics who were interviewed produced knowledge as part of their disciplinary identity and as required by their organisation. It should be noted that phenomenology, despite the fact that it affords an emic perspective of what knowledge is, does not capture boundary-making in ethnic politics, which, we believe, play a factor in Malaysia's science system.

Analysis for this paper was conducted using an interpretive framework. The research relied on an in-depth qualitative method that featured semi-structured interviews. There was a set of questions, but they were not used with rigidity. A semi-structured interview represented an 'opening up of the interview method to an understanding of how interviewees generate and deploy meaning in social life' (May and Beth 2011 p. 134). In such interviews, there are pre-set questions, but they can be expanded to better capture the respondents' experience. Dialogues took place among the interviewer and the respondents. Our two research assistants and the lead author of the paper used a 15-question list as an interview guideline. When we used the guideline, we often expanded those initial 15 questions into 33 to 43 questions. We asked questions about Penang location to our respondents, some of the questions asked were as follows: 'Can you tell me a little bit about planning Penang city? What about the semi-conductor industry background that cluster has'?; the history of the location: 'Do you know more about the history of Penang'?; the person and political party who were behind Penang's development as an urban area: 'Who was investing in the beginning for the high tech park? What differentiated Penang at that time from Klang Valley inside? Was Cyberjaya not there?' We asked the sociology of knowledge-related questions: 'What are the main outputs of USM in term of knowledge? Students or papers? Or patterns or the twin? Even the location?'; the science-policy-related questions: 'What are all the hindrances to academia-industry collaboration in USM'? Two research assistants also conducted interviews, mainly in Malay language and lasting for an hour and a half.

We started by asking key informants for recommendations of respondents/lecturers who were active in collaborating and in community development in TARUC and USM. In the selection of respondents, the lead author examined and explored lecturers/academics' experiences of third-mission engagement with communities outside university. In total, thirteen lecturers from both universities in Penang agreed to be interviewed. We received a number of rejections from other lecturers. The interviewees' backgrounds are mostly professors and senior lecturers. They have in average above five

years of work experience. These academics have a variety of expertise: psycho-educational counselling, marriage and family counselling and vocational and career counselling, information security, usable security, data security and privacy, spiritual issues in social work and social work education, reliability and maintenance modelling, inventory models, programming and optimisation, social psychology, service industries, urban development and higher education.

In addition, we completed an observation enabling us to take field notes for formal interactions, informal interactions and social actors' interpretations as reflected in informal conversation and formal interviews. The research assistants also completed an observation. Next is a review of government planning documents, related policies on higher education and the science system in Malaysia from 2011 to 2016.

5 Discussion

5.1 'The future lies in the past' -Penang as Part of Malaysia's Science System

Our engagement and discussion with scholars who have worked for over 15 years in Penang, Malaysia, gave an impression that social change and urban development follow an historically path-dependent development trajectory. Penang was originally designated as a port city in the 1960s. A respondent explained how the federal government in Penang took away its 'port city' status (Interview, Penang, 15 December 2015). The government of Penang drafted a report, and another report introduced the port city in the 1960s. These reports, as aired by the respondent, included electronic and electrical (semi-conductor electronic) industry. The port had a function to connect different economic hubs across countries.

The contention of this paper is that understanding the third mission is only possible by understanding the historical trajectory that shapes the ethnic politics of higher education in Malaysia, how a university evolves, and the ties it weaves from its advent to its current form. USM has a commercial (entrepreneurial) character of networking out of Penang. Lecturers at USM seem keen on collaborating and conducting research, while TARUC has a silo character, making it predominantly a teaching college rather than a university in its fullest sense. Third missions are shaped following the historical trajectory of these two organisations.

Penang functions as the gateway to the Indian Ocean (Gerke and Evers 2012). It is strategically located in the Straits of Malacca, a strait that has maintained its geopolitical position as one of the world's most important sea lanes (from the Indian Ocean to the South China Sea) (Gerke, Evers et al. 2008). It is also vital due to its position in cross-straits trade, labour migration and knowledge exchange (Ibid).

At a nation-state level, educational provision falls under the purview of the federal government (IPPTN 2010). The state government has no direct influence over higher education institutions, although a state representative may sit on the university board by invitation. Analysis of the fieldwork that I completed shows that funding for higher education research comes mostly from the MoHE (Ministry of Higher Education) and research from MOSTI (Ministry of Science, Technology and Innovation). Funding for research in MoHE is streamlined into six research themes. They must fit into the priority of the economic transformation plan in Malaysia. An expert who had held a position at MoHE explained lucidly in an interview:

> Six research themes are determined by the various universities, senior people from the industry. Mostly the five research universities (University of Malaya, National University of Malaysia/UKM, University Science of Malaysia/USM, University Technology of Malaysia/UTM, University Putra Malaysia/UPM). These people will sit down together with the Ministry of Higher Education in Malaysia to decide what are the priority areas that are in accordance to national economic transformation plan. (Interview, 26 December 2015)

Budgeting for research has to be relevant to the economic transformation plan's national priority. At MoHE, budgeting will be proposed annually, in the middle of the year. It will then be submitted to the Economic Planning Unit (EPU) for defence of budget allocation. The amount of research would then be decided by EPU on the basis of – as it was phrased by a respondent – a 'return for investment' (Interview, 2 December 2017). I contend that an economic transformation plan and economic rationale underpin the research theme process and research budget allocation in Malaysia. This line of argument is slightly different to the Malaysian government's market-accelerationist role in that the working of the science system is following the universities' key role; furthermore it should be acknowledged that

the universities playing a key role are primarily based in Peninsular Malaysia (West), not one of them is from Malaysian Borneo (East). More succinctly, the current science system arrangement does not address the disparity between East and West Malaysian universities.

Universities can function as centres of excellence. In this vein, MoHE launched a university Accelerated Programme for Excellence (APEX) initiative system in Malaysia. A senior academic discussed USM's APEX status: 'Gaining such status involved lecturers and students convincing the MoHE. The inherent planning and activity emanated from an idea conceived from the bottom; not a top-down idea' (Interview, 17 December 2015). USM received the first APEX status in 2008 (IPPTN, 2010). The APEX mission of USM states as follows:

> We aspire to lead and innovate in achieving excellence at the international level through advancing and disseminating knowledge and truth, instilling qualities that stress academic excellence and professionalism, developing holistic individuals and providing a strong commitment towards society's aspiration, the country's vision and universal aspirations."[7]

With the international collaboration that USM encompasses, especially in publications, it has the potential to be the main hub for the Northern Corridor and its vicinity in Peninsular Malaysia (Evers, Purwaningrum et al. 2014).

5.2   Commercialising Networks: Third Mission at Universiti Sains Malaysia

The establishment of Universiti Sains Malaysia (USM) in 1969, outside the traditional core region referred to as Kuala Lumpur, reflects a bold attempt to use higher education as an instrument to redress ethnic inequity and regional imbalances. Since its establishment, USM has attained significant milestones and accomplishments in teaching and learning, and in research and innovation. The university has responded to globalisation, marketisation and internationalisation by providing and maintaining good infrastructure (IPPTN, 2010).

Initially, USM was referred to as *Universiti Pulau Pinang*. A pioneer of USM, and as discussed with lecturers at USM, it has maintained a strong focus on STEM (science, technology, engineering and mathematics) fields. A senior academic respondent said that the state government initiated it in 1969, but then the federal government took over in 1970, intending to reorganise a national education system under the New Economic Plan. He added that the campus' location had not changed; it remains in Minden Pinang (Interview, 18 December 2015). The federal government at that time was following one of the Higher Education Planning Committee recommendations in the 1960s, specifying that a university college should be established in Penang and be prepared to admit students in the 1970s (Selvaratnam 1985). Malaysia's first prime minister, YTM Tunku Abdul Rahman, supported the location and USM's initial development (Interview, 17 December 2015). He thus encouraged the development of higher education in Penang.

The respondents have more awareness of Penang's strategic location. It was recognised as a UNICEF heritage city wherein multiculturalism serves as a backdrop for local residents. It has a population of 1.7 million. It is an urban area with proximity to industry (Interview, 1 December 2015). All of the

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[7] At its core, the APEX status does embody the „third mission" spirit of university's civic responsibility to contribute to the well-being of the society. The full text of the USM's APEX visions and planning can be read here: https://www.usm.my/images/pdf/apex2ndphase.pdf (accessed on 2 February 2020).

interviewees and fieldwork observations show such awareness, a premise that was not evident in TARUC (the Penang branch of a Kuala Lumpur-based university).

USM has a vision of 'transforming higher education for a sustainable tomorrow'. Its mission is that 'USM is a pioneering, transdisciplinary research-intensive university that empowers future talents and enables the bottom billions to transform their socio-economic well-being'. It was argued and reported in Mok (2010) that this corporatised university had a new governance structure composed of the Board of Directors comprising eight members: the chairperson, vice chancellor, a representative from the local community, two representatives from the government and three other people from the private sector. He added that with the strong decision-making power hinging upon the Board of Directors and the VC, the university is now run as a big business. Additionally, he pinpointed how the new governance model tends to favour the senior administration of the university, as the VC had the discretion to co-opt certain academics to become members of the senate from time to time, depending on needs and issues. The current model, adopted in 2017, is Chancellor, Pro-chancellor, Board of Governors, Top Management, Senate Members and Chief Information Officer (Mok, 2010). There are at least two members of the governing body who are from the private sector. One is working at the Northern Corridor Implementation Authority.

Mok (2010) suggests the following with regard to governance within USM: first, that the MoHE used to control appointments and leave approval matters. Next, with intention towards the de-bureaucratisation of university governance, the VCs can now exercise their discretion in leave approval and staff appointments. During Mok's field interviews with university senior management in Malaysia, all of the interviewed senior administrators confirmed with the author that they enjoy more decision-making power. However, the granting of more autonomy/discretion in university management has never been a 'free gift'. Scholars have argued (Sirat 2008a, Sirat 2008b) that in the area of autonomy, all public universities will be given autonomy to decide on certain matters (obviously not about financial matters). The universities, however, have also been reminded that the (greater) freedom that they are going to experience comes with added responsibility and accountability'. The MoHE has set up an audit unit to conduct an independent assessment of university performance. In addition, there is increasing pressure on audits and the assessment of lecturers' performance using key performance indicators (Interview, 2 December 2017). It is evident that USM is increasingly integrated with the neoliberal global norms shaping higher education.

Cooperation amongst scholars is a prominent feature. The collaboration has a predisposition of 'networking out' in the sense that international research projects and working with colleagues outside of Penang seem to be the favoured routes. The lecturers do use online media and online applications such as WhatsApp to share knowledge, but as conceded by a senior academic, sharing is still carried out by conservative means such as face-to-face meeting (Interview, 7 December 2015; Interview 1 December 2015). It is even more restrained in that lecturers at USM do not particularly favour seminars and sharing sessions. A lecturer describes 'jealousy', a term he used *in reference* to the syllabus produced by lecturers where few of them include books produced by their colleagues in USM. He added that the idea of listening to people from within the same faculty is not common at USM. In an interview, I received a frown from a senior professor when I asked her about seminar sessions. She refused to discuss this further and explained about research project activities already existing at USM. These are examples, albeit anecdotally, of the dearth of intra-campus collaboration between USM lecturers.

In several studies carried out by Evers and Gerke (2015) and Evers et al. (2014), lecturers at USM prefer to collaborate with their counterparts in the West. This trend is further confirmed by a more recent scientometric analysis by (Partelow, Hornidge et al. 2020). We had asked about this matter of collaboration among lecturers, as it is through collaborative research projects that lecturers share their insights and knowledge. A senior professor conceded, to which we cite verbatim from his lived

experience, as follows:

> Between lecturers, I think this is most sharing, sometimes people walking with each other like for me maybe I work with colleague in sociology, in anthropology, and then when we were walking, in this research, then we talk about, 'so how we going to do this qualitative discussion' and then we share with each others in something we learn from research, and we get people each other, and some them have not done this before, so – have not done focus group discussion before. So we, the most experienced researchers, conducted that first, then we are suddenly go to conduct that also learn. So that, that is kind of sharing while working together in research project. (Interview, 01 December 2015)

Knowledge is being produced in terms of its human capital training through teaching at USM. It has a strong disciplinary orientation. The academic programme at USM is based on three main principles. First, the offered courses have to meet the country's requirements and interests. Second, the form and functions of its education have to be different to those offered by other local universities, while at the same time ensuring a balance between courses. Third, the university has to provide for research and the accumulation, advancement and dissemination of knowledge (National Higher Education Research Institute, 2010). Research is also singled out as a way of producing knowledge. When asked about knowledge production, a senior professor replied:

> I completed a research on poverty. I hope that those up there – the ones holding power – can read and take advice from my research. If not, then I can use it for myself. Publishing this research will bring me to variables that will lead to promotion; but like I say not everyone is entitled to promotion. Satisfaction is needed to oneself due to work achievement, without compensation or material rewards. (Interview 23 December 2015)

Individually, as stated by a respondent, knowledge sharing is not always about material rewards. It was mentioned several times that there are other values to be gained, including work ethics and religious values, as several of the respondents are Muslims. Organisationally, there is a pervasive emphasis on the commercialisation of knowledge as a visible product at USM. U-Science of USM was established to handle commercialisation. It was established in the 1980s at a time when the government supported university 100 percent of the time. A respondent explained how higher education is becoming very expensive, thus there is a need to share the burden of providing higher education. Taking this into consideration, the university took part. There were regulations set by the university, USM was and is allowed to establish its own private income, generating all of these. The idea of commercialisation does not always echo positively among other lecturers. One lecturer stated that certain disciplines, such as social work, produce thinkers:

> We are in social work, we do not produce products. I hope I produce thinkers, so if the term is product, it is tangible. We do not produce such product, but if it is mindset, to bring students to a foundation, then I will try my best to do that. (Interview, 26 December 2015)

In the spirit of capitalism-infused commercialisation, reports suggest that USM franchises some of the teaching in the Local Public University Degree Franchise Programme (Middlehurst and Woodfield, 2004 p. 8 as cited in Mok 2010). Under this arrangement, 'students can pursue three quarters of – or even the entire degree programme in certain private colleges – and be awarded with degree qualifications without staying as "internal students" in established local public universities' since these public universities provide the entire curriculum (Middlehurst and Woodfield, 2004 p. 8 as cited in Mok 2010).

Summing up, USM presents a case whereby the third mission is shaped with a strong orientation of networking out at a global level through research or project collaborations and increasing commercialisation activities.

5.3 Community Engagement and a Restraining Silo at Tunku Abdul Rahman University College (TARUC)

Tunku Abdul Rahman University College (TARUC) was initially established in 1969 by the Malaysian Chinese Association (MCA), one of the component parties of *Barisan Nasional* (BN), the former ruling coalition. The abbreviation *MCA* arose frequently during interviews in the field. Tunku Abdul Rahman was the first Prime Minister of Malaysia. The school bearing his name expanded into a university in May 2013. The tuition fee is set low; they rent out facilities to outsiders and facilities for training. The government has provided additional support (Interview, 18 December 2015). Enabling access to education comparable to UiTM MARA for Malays is visible in TARUC, as demonstrated in its low tuition fee and a sense of responsibility to teach well. Simply put, both TARUC and UiTM are products of the ethnic-based politics that have long pervaded the Malaysian political landscape.

TARUC's vision is to be 'a distinguished institution of higher learning acknowledged locally, nationally and globally for its excellence in providing opportunities for the intellectual, personal and professional development and growth of its students by fostering their inquiring, creative and innovative minds to succeed in life'. TARUC's mission is threefold: first, it is committed to complement and supplement the government's efforts to provide quality education and training on a comprehensive range of disciplines and levels, thereby adding to the development of human capital in Malaysia. Second is that it will focus on students' total development to their fullest potential, and its graduates will be imbued with knowledge, skills, values and attributes to succeed in life and work, contributing to the technological, economic and social advancement of the nation. Third is that it is committed to maintaining strong links with business, industry and the community, as well as to collaborating with other renowned institutions for the purpose of fostering continuous improvement and learning. The last aspect does not postulate international collaboration, which is lacking in TARUC. All of the missions put forward a universal education that provides 'special treatment' to Malays. This premise will be contested and explained in the text.

The fieldwork in Penang was conducted two years after its expansion. TARUC's main campus is in Kuala Lumpur and it has an additional five branches in Penang, Perak, Johor, Pahang and Sabah. All of the interviews were carried out in Penang.

Historically, TARUC has been outside the remit of government science policy in terms of research funding. In an interview, quoted herewith verbatim, a respondent specifically noted that TARUC was established for the Chinese in Malaysia:

> This college (TARUC) was established a long time ago in Kuala Lumpur. There was MCA in Kuala Lumpur, and they played a role (in establishing TARUC). They built the College for the Chinese in Malaysia, so that there is one higher education for this purpose. We now have a number of branches. (Interview, 28 December 2015)

TARUC also received subsidies from the government in its academic activity (Interview, 18 December 2015). The university, hence, received support not only from MCA but also from the government. For example, Malaysia Digital Economy Corporation (MDEC) provides training for lecturers in TARUC's IT programme. MDEC is a government organisation providing training in IT. A lecturer described how MDEC sponsors courses in terms of training and training funds (Interview, 18 December 2015).

TARUC was located in Tanjung Bungah, Pulau Pinang. In the interviews, observations, and documentary data that were analysed, there is no cognisance or consciousness that TARUC is located

in a city formerly functioning as a port city. Reference was made to a key person who financially sponsored the establishment of TARUC in Penang:

> This land was bestowed to us by Boon Siew. He had the ownership of the land title. There was no single house here. It was all trees. Then there was support and sponsorship from Boon Siew. So, they established the college (TARUC) here. I recall there was only one building located on Transfer Road. They would have courses in that building. Then they moved. MCA owned the building. They had courses in the building. It was a small building. We moved here fourteen years ago. (Interview, 28 December 2015)

According to *The Star Malaysia*, during his lifetime the late Tan Sri Lon Boon Siew was the richest man in Penang (*The Star*, 2017). He started the Oriental Group in Malaysia and was famously recognised as 'Mr. Honda' after bringing the Honda brand into Malaysia (*The Star*, 2017).

A particular feature of knowledge-production activity is its teaching. TARUC lecturers have knowledge-production activities that are disciplinary and combined with life experiences of application of that knowledge. Most of the lecturers had work experience outside TARUC prior to becoming lecturers. Hence, they may teach theoretical components, but they also share real-life experiences or work-based experiences (Interview, 14 December 2015). This resonates with what the lead author had encountered in her fieldwork at ATMI Polytechnic Cikarang, whereby knowledge is not scientific knowledge but more work-process knowledge (Purwaningrum 2016). This came about when the question of what strategic knowledge is in their work:

> An example is cement production. Most industries target low cost but with high quality. They try to find lightweight materials. I asked my student to find other alternatives other than using materials or substances that can substitute the materials and alter the materials into lightweight one with the same quality and strength with normal weight. Students then learn through experiences, there is no theoretical textbook. They will try out and compare, with this group does so and not the reverse. (Interview, 14 December 2015)

Publications in peer-reviewed journals and key performance indicators rarely surfaced during interviews. A lecturer made a reference to the applicability of knowledge being produced in terms of usage by professional bodies, such as CIOB (the Chartered Institute of Building)[8], and industry. When asked about how they update or upgrade their knowledge, no reference was made to theories or the expansion of basic research; responses tended to have more to do with what the industry needs.[9] The lecturer was based in the school of building, he explained, 'Basically, we try to update (knowledge) with what the industry needs. What it needs or if there is new equipment or technologies, we will then update it here in TARUC' (Interview, 14 December 2015).

Work routines would be to follow a timetable of teaching: one week, it consists of 18 to 20 hours of teaching. A lecturer vividly outlines her teaching experience:

> Teaching includes various activities. Every day, there are a lot of tasks. One lecturer must teach various subjects. Lecturers in here must fulfil teaching hours. We cannot teach only a little. It has to be very busy. Whatever they (programme leader or management) share, we must take it. (Interview, 28 December 2015)

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[8] The Chartered Institute of Building (CIOB) is a global professional body for construction management and leadership. It accredits university degrees, educational courses and training. The headquarter of CIOB is in Bracknell, UK. Further information is available as follows: https://www.ciob.org/about.
[9] One could contrast this remark with the aforementioned "third mission" spirit found in the USM's APEX visions and planning.

Syllabi for courses that are similar to those at the Kuala Lumpur (KL) branch of TARUC are to be coordinated or consulted on with lecturers in TARUC. It was interesting that, during the interviews, there was no mention of experiences of fitting teaching to local or regional components in Penang. The tie with KL is thick as it engulfs the connection it may have had with the kind of economic activities that exist in Penang. There is a responsibility in teaching, as well – so much so that leaving for five days for a course in MDEC would feel like a burden to a lecturer; replacements have to be organised according to the teaching timetable. The reality sketched is thus a silo that orients the organisation to function inwardly. Outward would be to the main branch in Kuala Lumpur.

> TARUC does invest in academic capacity-building for its staff. This takes the form of training and upgrading the lecturers' capacity. Each lecturer must attend a workshop every year for at least five days, as a lecturer explained. (Interview, 18 December 2015)

This is centred in Kuala Lumpur, nonetheless:

> We have it in the main campus in Kuala Lumpur. We have a centre for investment (in training). For instance, the College (the top management) provides courses and distributes certificates for this. Such practice adds knowledge in our respective fields. In this knowledge upgrading and training, we leave once a year or twice a year. (Interview, 14 December 2017)

In the spirit of upgrading the lecturers' capacity, TARUC discharges its third-mission service in community engagement. It manifests in giving many free workshops for secondary students. TARUC received numerous invitations from secondary schools to provide such workshops. Schools such as Pwin Hwa School, Chong Hwa School and Dato Keramat School in Penang requested the workshop. The lecturer stated with confidence that 'Sometimes, we share our knowledge and our company with the students. Yes, I will go for workshop free' (Interview, 18 December 2015). The fieldwork analysis suggests that although TARUC was initiated by MCA, it does not discriminate in terms of providing free workshops, providing them to students regardless of race or ethnic origins.

Knowledge sharing, nonetheless, is predominantly conducted face-to-face. Some of the discussions with students are carried out using intranet. Facebook was used, but not too often. During consultation hours, students come and discuss things with their lecturers. Discussions also take place using WhatsApp and Wechat. For lecturers, such use would likely happen during meetings or conferences in Penang. The lecturers at TARUC are obliged to attend four seminars annually in Kuala Lumpur. During the seminars, lecturers from all branches would get together and share their teaching experiences.

Collaboration with surrounding institution may well be facilitated through alumnaeship and can be restrained by the main branch in Kuala Lumpur. There was collaboration with University Utara Malaysia for an IT course, where a lecturer had completed her study (Interview, 18 December 2015). A lecturer shared her experience in an interview. She was an alumna of the University of Technology Malaysia. She explained how there was another professional senior surveyor association that mostly concerns the exchange of information. The information, she said, can be valuable in terms of projects, but when concerning the renewal of knowledge, she would contact her former classmate, as they work in the field they had studied (Interview, 14 December 2015).

In an interview and observation, a hierarchical structure exists between lecturers and the main management of TARUC, the latter sitting atop the ladder. The lecturer stated that 'lecturers will only follow instructions from the top management'. She added:

> Lecturers in here are bound to the main campus through various methods of communication, either official or unofficial. If it is official, we will go through the supervisor in charge and they will deal amongst them (Interview, 14 December 2015).

'Policy' to lecturers in Penang means the Kuala Lumpur branch: every decision should be referred to the main branch in KL. Hence, TARUC in KL determines what policy is. There was barely a mention of research funding from MOSTI, and MoHE was rarely mentioned during interviews and observations. Collaboration happens via projects from the private sector. Consequently, third-mission activities may well be determined and controlled by the main branch in KL.

6 Conclusion

At the onset, the paper asked how the application of the university's third mission affects the production of scientific knowledge in Penang, Malaysia. Universities in Malaysia face increasing pressure due to the globalisation and transnationalisation of higher education. Inspired by Science and Technology Studies discussions, this question was pursued by assessing the ways in which the third mission influences knowledge production in Malaysia. Focusing on Penang, Malaysia, the first section embedded the study into the respective literature on the role of science in shaping societal transformation processes: one way to investigate this is by looking into how the university as societal player shapes scientific knowledge production. It was highlighted how Malaysia capitalises on scientific knowledge production to build a knowledge-based economy.

The contention of this paper is that the ways in which the third mission affects knowledge production are aligned with increasing autonomy and the disciplinary orientation of knowledge production at a university level. Autonomy signifies an orientation shift in the Malaysian science system due to its growing marketisation, the dynamics of ethnic politics, and historical trajectory. Disciplinary knowledge production unpacks a continuum between emphasis on the commercialisation of knowledge and the social product of knowledge on the one hand or the vocational/work-process-knowledge orientation on the other. Transgression of the boundaries of knowledge should be teased out from narratives within organisational knowledge production. The literature review outlines ideas about the third mission while focusing on the second and first missions. The latter refers to teaching. University traditionally provides teaching characterised by *freedom*. To put it briefly, teaching is associated with academic freedom. The second is linked to research. The university has been at the forefront of research-related activities such as reading groups, seminar activities and fieldwork activities. It hosts researchers and lecturers. There is an acknowledgement that the university has a role outside of teaching and research; one that is intertwined with its wider civic, social and economic role (Perry 2006).

The third mission refers to the changing roles and functions of universities at the interface between science and politics, as well as science and the private sector. Based on interview-based research, the above assessed how this third mission is being reflected on locally. Key measure applied by the interview was the level and quality of engagement between science and local to national politics.

Scholarly contributions on the role of the university in Malaysia have been centered upon its political autonomy while at the same time reflecting on its role in shaping the government's development and economic growth agenda. This interplay of the two roles is known as the *global* or *hybrid* university model. Malaysia enacted the Education Act 1961, which was a policy taking into account recommendations by a number of review committees in education. The racial riot further enveloped universities under the remit of the Emergency Ordinance No. 74 in 1971, which brought to life the University and University Colleges Act 1971 (Wan 2017). The New Economic Policy (NEP) in 1970 brought the birth of preferential and quota treatment to Malays. It is not only the previously applicable NEP but also the overall policy backed up by the United Malays National Organisation (UMNO). University Teknologi MARA (UiTM) stood as an example of the active promotion of higher education in the Malays beginning in the 1960s. The policy ended in 2001, though there is no clarity regarding preferential treatment. These ethnic politics serve as the backdrop of university's engagement with society in its third mission. Increasing autonomy came along in the late 1990s whereby there has been a predisposition towards quasi-marketisation and marketisation of higher education. Such autonomy also opened doors for corporatisations to arise in Malaya.

The fieldwork and analysis for the paper was informed by a qualitative interpretive approach. It uses micro-meso approach in sociology. The analytical framework employs a phenomenological approach

developed by Alfrend Schuetz (Sato, 2007 as cited in Schutz 1967). It included semi-structured in-depth interviews with academics in two universities located in Penang, Malaysia; analysis of secondary documents and newspaper articles; and observations in the field.

Penang, Malaysia has a function in port trading as it is the gateway to the Indian Ocean. The science system in Malaysia has several unique features: education policy had been tasked to promote national unity by gradually unifying all linguistic streams of schools, but the state government in Penang had stated in 2008 that it was exiting the pro-Malay policy. Education provision is under the purview of the federal government; the state government has no direct influence towards policymaking in the science system. Research funding, which is mostly financed by MOSTI and MoHE, is responsible for the overall support of the economic transformation plan in Malaysia. Our argument is that the economic rationale and economic transformation plan underpin research budget allocation and thematic agenda setting processes in science.

Through its APEX status, USM is tapped into the Northern Corridor in Malaysia's super corridor plan. Lecturers at USM have shown a degree of awareness of the vital role of Penang's location in the straits of Malacca. There MoHE wields less control over USM as shown in its board of directors' appointments. However, there is an audit unit in place that conducts independent assessment of the university's performance. Key performance indicators audited by MoHE serve as incentives for lecturers and researchers at USM to conduct research meeting targets set at a global level. They are meant to integrate USM into a more a globalised transnational system of higher education. Publications in well-ranked and peer-reviewed journals are part and parcel of the indicators. Hence, it is not a surprise to find in the interviews that research collaboration has been more predisposed to 'networking out' at USM. Our finding shows that face-to-face discussions and knowledge exchanges are engulfed within research project meetings rather than in seminars within schools and among faculties. Knowledge is being produced in terms of disciplinary orientation in human capital training. Yet, strong work ethics and religious value prevail at USM. Both are infused, however, with the spirit of capitalism as well as commercialisation. At USM, it is argued that the third mission is shaped by a strong orientation towards disciplinary scientific knowledge production and networking out for research activities; it also favours the marketisation of higher education.

TARUC, the second organisational case study, was established by the Malaysian Chinese Association (MCA). There is an explicit consciousness, as aired by lecturers working at TARUC, that the late Tan Sri Lon Boon Siew played a key role in the establishment and financial support of TARUC in Penang. There was no mention about the role of Penang as a hub. Next, the main campus in Kuala Lumpur functions as a gatekeeper in terms of syllabus revisions and teaching-hours'-related decisions. The latter is vital as societal engagements are only possible through one having fulfilled one's teaching-hours commitments. Typicality of the knowledge produced is for teaching purposes, but it goes beyond that. As there is an emphasis on work-process knowledge as calibrated through the work experience of its lecturers.

Moving forward, Penang, Malaysia, embodies a meso reality of the science system in Malaysia. It is characterised by integration towards the global market on the one hand, and a strong resistance towards some of the policies tailored at the federal level on the other. The capacity of the power of knowledge produced locally to transgress, hinges upon an understanding of the increasing marketisation, ethnic politics and historical trajectory of the region. Thus, the third mission should to be teased out from narratives and social realities within the organisational knowledge production of the university.

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