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MALAYSIAN DOCTORAL DEGREE PATHWAYS: A REFLECTION

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Abstract

The purpose of this paper is to review the Malaysian Qualification Framework (MQF) 2.O on the doctoral degree definition, standing, pathways and the standards applicable. This is in order to assess international comparability and possible attainment of doctoral degree learning outcomes to produce knowledge workers who are able to contribute new knowledge to the industry to enhance innovation and economic growth and prosperity. The method is to review the MQF MQF doctoral standing, pathways, standards and learning outcomes which will be contrasted with international benchmarks. The doctoral standards and the MQF 2.0 will also be reviewed for consistency. It is suggested that the MQF have a common doctoral level for new knowledge learning outcome and graduate attributes to create the knowledge worker. This however is utilised through three differentiated pathways research (Phd), mixed mode and coursework (doctoral) with differentiated assessment and standing of the doctoral degree. The coursework mode particularly raises the issue of quality assurance and ability to fulfil the desired outcome. This is especially so when with provision of three routes, only the PhD route termed as research. The MQF2.0 has a common level descriptor across all doctorates predicated on research (including new knowledge) as seen in para 87 and 88 of the Standards. The common one standard level research outcomes cutting across all doctorates is evident under Appendix 2. But the question is whether this is compromised by the differentiated assessment and mode particularly via a coursework doctoral degree as evident in the Standards. It is suggested that the three pathways departs from international practices. The usage of the terminology academic doctorate (PhD) and professional doctorate is seemingly conflicted with international usage and the coursework doctoral degree arguably a deviation from international benchmarks and bereft of the outcome required of a doctoral degree. This is an early paper attempting to review the doctoral degree under the MQF 2.0. It is also an attempt to link postgraduate doctoral education and the production of knowledge workers relevant to the industrial, digital age and beyond. It is an invitation for the relevant authorities to review the MQF 2.0 with due regard to the functionality, purpose, broadening of concept, standing and assessment (quality assurance) of dual PhD namely academic and professional doctoral degrees. This is to assure that the doctoral degrees are benchmarked to international practices including catering to the needs of industry for creation of new knowledge and innovation in industry environment that translates to a vibrant economy under the equivalent routes of academic and professional (professional work environment).

***Keywords*:** Malaysian Qualification Framework 2.0 (MQF 2.0), Malaysian Standards on Masters and Doctoral degrees, Research Degrees, Academic Doctorate, Professional Doctorate, Knowledge Worker, Industry Driven and Quality Assurance and Research Outcomes.

1. Introduction and Research Method

This paper opens with a literature review into the concept of a research doctoral degree. The connectivity to economic development is also discussed at a later stage. The focus is on the Malaysian Doctoral Degree three doctoral pathways (academic PhD, mixed mode and coursework) to study how it is to attain a common level descriptor outcome given the differentiations, particularly in assessment. It will be demonstrated that a doctoral degree internationally has a two equivalent in standing pathways namely academic (basic research) and professional doctorate (applied research) that have a common level descriptors and both require comparable research outcomes in different environments. Academic and professional doctorates are both categorised as research doctorates of equivalent standing meeting research common descriptors internationally. Hence, this paper seeks to review whether this is comparable with the MQF 2.0 concept of academic and professional doctorates, concept of research doctorates and the differentiated pathways and examination particularly as with regards to coursework doctorates. This paper has been written over an extended period and states the position as at Oct 2018.

In this regard, the qualitative analysis of the provisions of the Malaysian Qualification Framework 2.0 are benchmarked, compared and contrasted with international qualification frameworks like International Standard Classification of Education (2011), Australian Qualification Framework, ASEAN Qualification Framework and United Kingdom Quality Code, United Kingdom Doctoral Characteristic and Framework for England Wales and Northern Ireland.

1.1. Research Doctoral Degree

It will be seen that professional doctorates may be either degrees at the same level as PhDs or professional degrees with little or no research content (pure practice based)not placed at the level of research.

In the United Sates(US), professional doctorates are degrees that require a minimum of six years university level study including any pre-professional bachelor and associate degrees (US Department of Education, 2012). They do not, unlike professional nor academic research doctorates, require a dissertation or study beyond master's level. This includes degrees like Pharmacy (Pharm D), Dentistry (D.D.S or D.M D), Law (J.D.) and Medicine (M.D). In Canada (Council of Ministers of Education Canada, 2007), the degrees of LLB, DDS, MD or JD are situated at degree level primarily because of the lack of the research component and new knowledge outcomes.

In the US, a doctoral degree with research/scholarship is a PhD or other doctoral degrees that require advanced work beyond the master's level including the preparation and the defence of a dissertation based on original research or the planning and the execution of an original project demonstrating substantial artistic or scholarly achievement. Some examples of this type of degree may include Ed.D., D M.A, D.B.A, D Sc, D.A or D.M and others as designated by the awarding institutions. In Canada, Doctor of Education (Ed D), Doctor of Social Science (DSS) and Doctor of Business Administration are in this category and it incorporates elements of professional practice with an academic dissertation (Councils of Minister of Education , Canada 2007)

This is also the case in the United Kingdom (UK) where first degrees in medicine, dentistry and veterinary science are at master's level. (UK Quality Code Art A para 4.17.5) The use of the title doctor does not indicate a qualification at doctoral level (Quality Assurance Agency [QAA], 2014). Qualifications like Ed D and DBA are recognised research degrees equivalent to academic doctorate degrees. Reference is made to the UK Quality Code Part A (2014 p.17 and 18) wherein Doctoral degrees are listed to include eg PhD/DPhil, Ed.D, DBA, DclinPsy.

Most other jurisdictions like Australia, reserve and guard the term doctorate for research degree to avoid the dilution in the trust, quality, outcomes, integrity and standing of the degree

1.2. Professional Doctoral Degrees

Professional doctorates are awarded in Australia, England and United States (Clarke & Hunt, 2014). Clarke and Hunt explains that doctoral degrees have been revised to cater to employed professionals returning to undertake doctoral study while working as knowledge workers are required in a knowledge economy where complex problems are addressed using sophisticated intellectual and analytical skills.

The study by Clarke and Hunt (2014) highlights the need for countries to decide the extent to which the continued expansion of postgraduate education is sustainable and to clearly identify and articulate the benefits of postgraduate qualifications at different levels.

It also has been commented that the clarity and distinction of professional research doctorates and a traditional research PhD is becoming blurred (Brown & Cooke, 2010). This clearly requires a thorough understanding of the concept of professional and academic doctorates, the realms within which they are functional and required to be value added.

This is the mechanism to ensure that national economic advantage is secured by the investment into research and education. There should be one common standard of equivalency (without biasness) resting on research and knowledge creation or innovations for all doctoral degrees to attain.

Otherwise, the doctoral paper qualification may be conferred too easily (especially via coursework) in mass quantities though it may not translate to the desired outcomes in MQF 2.0 whether for the candidate, industry or nation. The party who stand to benefit would be the higher education providers from the commercialisation of education that seemingly focuses on quantity and not quality at the detriment of Malaysian higher qualification reputation and standing.

It is timely to note that one of the United Nations (2015) Sustainable Development Goals is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. There is a shift from merely providing access to education to access to quality education. It is this spirit that needs to drive the regulators and quality assurance agencies in Malaysia.

1.3. Link Between Human Capital and Industry Vibrancy

The quality and level of education determines and causes the vibrancy and the well-being of any economy (Department for Business Energy and Industrial Strategy, 2017). It demarcates the ability of the economy to leapfrog and transform the industry. However, the disconnect between institutions of higher learning and the industry inhibits the development of human capitals needed to fuel the transformation (Nakewa, 2018).

Therefore, it is crucial that proper foundation is created, with detailed and sufficient regulatory touch and direction made, to ensure the requisite levels of substantive knowledge and skills of the doctoral graduate in any field meets the high standards of level, depth, width and currency in order to generate or innovate new knowledge arising from research that will transform or facilitate and add value to the industry. As noted by Chigisheva, Bondarenko, and Soltovets (2017) the key factors affecting the reputation of each country's doctorates include having in place adequate and rigorous quality assurance mechanisms for doctoral programmes and the ability to demonstrate consistency of standards of achievement across varied programmes.

Likewise, in the World Bank Higher Education Development Support (2017), the question of improved regulation of quality of teaching and research were highlighted, to "*support robust*

and effective government regulations of higher education systems and high quality institutions and programs".

In this regard, there are at least four important considerations namely:

1. The entry requirements of such a student whether he has the requisite capacity for progression for the standards and levels set for a doctoral level. This is an area though highlighted here is incidental to this paper and requires a more detailed study.
2. The other aspect is to ensure that the route and expectation that are drawn up measures up to and is quality assured to deliver the outcomes it assures at the doctoral levels. Otherwise, the trust that resides with the education providers, quality control agencies like Malaysian Qualification Agencies (MQA) and even the ministry of education would result in a crisis of trust in the quality of education and the misalignment of objectives of the doctoral degree.
3. There is a need to recognise and expect the prescribed outcomes that is predicated on research from all doctoral degrees (as research degrees) in a two-pathway framework namely academia or industry (professional). The qualification descriptor common to all doctoral degrees underscores the need for research to create new knowledge in academia or in the industry which is the unified outcome and pathway for all doctoral degrees which are accorded the same standing as research doctorates.
4. The need for regulation and control over the licensing of higher education providers who are licensed to offer doctoral degrees is also a matter that requires deliberation.

This paper excludes PhD by publication or integrated PhD and examines the Phd mixed and course work pathway under the MQF only.

1.4. The Need for Common Standing Doctoral Degree

This section of the paper is designed to address questions above. It will be demonstrated that the Malaysian MQF 2.0, ASEAN Qualification framework, ICSED, Australian Qualification Framework and the England and Wales all require a common level of new knowledge creation (applied or basic or experimental) in order to attain the doctoral level outcomes. This is a common research outcome for all doctorates.

For the international standards, there are only two pathways, academic and professional, determined by the environment of study which is related in part to whether it is applied or basic research. The standing of the doctorates and the rigours of standards to attain the research level descriptors are ensured to be common. Both academic and professional are categorised as research degrees of equivalent standing as it is a direct result of the attainment of the level descriptors which prescribes research outcomes.

But the MQF 2.0 has its own interpretation of conventional or traditional professional doctorate and academic doctorate. In the MQF and Standards nomenclature which treats mixed –mode as a Phd but the MQF treats it as a doctoral degree. Academic Phd is treated as a professional degree. In the MQF Appendix 1 , the Phd is only accorded to Phd by research. By implication, the other doctoral degree are not research based. This again runs counter to the Appendix Outcomes required of a doctoral degree student in the Appendix 2 of the MQF wherein the phrase doctoral and not Phd is used.

The research degree status is also accorded to only Phds in the MQF 2,0 (para 89 MQF 2.0) though this is perplexing when the level descriptors prescribes a research outcome on paper for all doctorates (para 87 and 88 MQF and Appendix 2 Level 8) not unlike the international standards. But, is it arguably not possible given the differing mode of assessment especially for the coursework doctoral degree. The same implies heavy taught components that internationally

aspire to masters' level only and a research project that is internally assessed and not much more than an assignment.

Internationally recognised professional doctorate research qualifications like EdD , MBA are here classified as coursework doctorates. (Malaysia Standards on Masters and Doctoral Degrees). Reference is made to the UK Quality Code (2014 p.17 and 18) wherein Doctoral degrees are listed to include eg PhD/DPhil, Ed.D, DBA, DClinPsy.

The route of mixed mode and coursework doctorates are introduced with different standards as routes to a doctoral degree (PhD, mixed mode and coursework). The pathway is not classified in the same way as international benchmarks namely professional and academic.

This coursework route is not accepted by ICSED by which MQF2.0 is stated to be guided nor is it a pathway in the international benchmarks under study. It is the further argument that the coursework doctoral degree is not situated to attain the doctoral level descriptors. This would denude the MQF 2. 0 doctoral qualification and hamper the desired effects and the significance of a professional doctorate which is aligned to industry to generate new innovation, breakthrough and technologies to enable transformation of the economy in an industrial and digital age.

As highlighted in the opening statement, the quality and level of education is the stream that feeds into the industry determines and causes the vibrancy and the well-being of any economy. It demarcates the ability of the economy to leapfrog and transform as a high end human capital that impacts the industry is a requisite. It is necessary to fuel the transformation and be ready and equipped for a fluid future economy. It is the statement by local experts that the technological capabilities and innovativeness of the workforce and the prowness of the research and development community that will determine the ability to ride the Fourth Industrial Revolution wave (The Star 2018, Industry 4.0 Success depends on key factors).

University World News (8 June 2018) also commented on this global issue that "*the disconnect between institutions of higher learning and industry is proving to be a serious inhibitor of the development of local skills needed to ensure the extractive industry takes off in East Africa, according to some of the region's experts.*"

David Boud and Allison Lee (2009) in Changing Practices of Doctoral Education highlighted many key issues among other is the need to respond to changes in an increasing competitive knowledge economy. Here, the professional doctoral graduates are knowledge workers contributing directly to the economy in applied context of industry innovations, disruptions and new knowledge.

2. Overview and Benchmarking on Doctoral Degree Outcomes and Pathways

The following tables are meant to provide an overview of some of the standards of benchmarks under study. It is noted that the United Kingdom is set to revise their Quality Codes in near future. It will reveal these main points. The descriptor level is the production of new knowledge with research as the defining characteristic for all doctorates. The pathway is divided into professional and academic based on where the research is undertaken and whether it is basic or applied or experimental. The research outcomes are quality assured by defining standards common to all doctoral degrees and with external examination. Any limited coursework component does not replace the research outcomes of the doctoral level descriptors. All doctorates are either professional or academic in orientation with no coursework option. All doctorates are of equivalent standing.

Table 1: Australian Qualification Framework

Purpose	The purpose of the Doctoral Degree is to qualify individuals who apply a substantial body of knowledge to research, **investigate and develop new knowledge, in one or more fields of investigation, scholarship or professional practice.** Doctoral Degree qualifications are located at level 10 of the Australian Qualifications Framework. There **are two forms** of Doctoral Degree with the same descriptor within the Doctoral Degree qualification type. **Research is the defining characteristic of all Doctoral Degree qualifications.** ". (author emphasis)
Doctoral Degree (Research)	Leads to the award of a Doctor of Philosophy so that graduates will have undertaken program of independent supervised study that produces significant and **original outcomes culminating in a thesis, dissertation , exegsis or equivalent for independent examination** by at least two external expert examiners of international standing. **Research** in the program of learning will be for at least two years **and typically two –thirds** or more of the qualification. The program of learning may also include advanced coursework to enhance the student's capacity to make a significant contribution to knowledge in the discipline (or cross–disciplinary field). The advanced coursework may support but not replace the research outcomes.
Doctoral Degree (Professional)	Is a qualification designed so that graduates will have undertaken a programme of structured learning and independent supervised study that produces **significant and original research outcomes culminating in a thesis, dissertation, exegesis or equivalent for independent examination** by at least two external expert examiners of international standing. **Research in the program of learning will be typically for at least two years of the qualification.** The program of structured learning which will include **advanced coursework designed to enhance the student's capacity** to make a significant contribution to original knowledge in the discipline (or cross- disciplinary field) and/or research – integrated practice developed in collaboration with a relevant professional statutory or regulatory body. The advanced coursework and research-integrated practice will support the research outcomes.

Source: Australian Qualification Framework 2013 2nd Edition. (emphasis added)

Table 2: ASEAN Qualification Assurance Framework Level 8

Demonstration of knowledge and skills that: is at the most **advanced and specialised level** and at the **frontier of a field** • involve **independent and original thinking and research**, resulting in the creation **of new knowledge or practice**	**Application and Responsibility** **The contexts in which knowledge and skills are demonstrated:** • are highly specialised and complex involving the development and **testing of new theories and new solutions to resolve complex**, abstract issues • require authoritative and expert judgment in management of research or an organisation and significant responsibility for **extending professional knowledge and practice and creation of new ideas**

Source: ASEAN Qualification Assurance Framework. (emphasis added)

The ASEAN framework reaffirm the benchmark of the doctoral degree in the standing of independent, original thinking, creation of new knowledge or practice or the testing of new theories or new solutions to extend professional knowledge and practice.

Selected provisions from the UK Quality Code, UK Doctoral Characteristic and Framework for England Wales and Northern Ireland are encapsulated in the Table below. It also affirms the need for original and new knowledge at frontiers of discipline that merits publication. It affirms the academic and professional routes while treating them both as research degree and equivalent with common standards.

Table 3: Selected provisions on the UK Quality Code, UK Doctoral Characteristic and Framework for England Wales and Northern Ireland

England and Wales: Common research outcomes, standards and rigour, dual pathway depending on environment of study	Under UK Quality Code Part B Chapter 11 Research Degree it states that "*doctoral degrees are qualifications rooted in original research: the creation of new knowledge or originality in the application of knowledge.*" Framework in England Wales and Northern Ireland requires the creation and interpretation of **new knowledge through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline and merit publication** - A systematic acquisition and understanding of a substantial body of knowledge which is at the **forefront of an academic discipline or area of professional practice. Where holder are able to** continue **to undertake pure and/or applied research and development at an advanced level, contributing substantially to the development of new techniques, ideas and approaches** Doctoral programmes that **may have a substantial taught component in addition to the research component (for example professional doctorate) leads usually to awards which include the name of discipline in their title (for example Ed D or DClinPsy for Doctor of Clinical Psychology). Professional doctorates aim to develop an individual professional practice and to support them in producing a contribution to (professional) knowledge.** The Doctoral Characteristic (2011) para 5 deal with the doctoral assessment. All are subjected to a thorough review and an oral examination. The candidate must submit a substantial body of original work for assessment. External examining by two of three examiners is a key feature of the assessment and quality assurance process. There should be at least one external examiner of international standing. With reference to the latter, the UK Doctoral Characteristic commented that "*one of the most important purposes of having such descriptors is to achieve* ***equivalence of academic standards across doctoral awards*** *by* ***summarising the key attributes expected of a doctoral graduate.*** *Doctoral qualification descriptors promote a high level of consistency....* ***Integration of the attributes relevant to the doctoral level with those required of more experienced researchers has recently been established in the Vitae Researcher Development Framework (RDF).***" The UK Doctoral Characteristic is stated (p23) " *that the objectives of the guide was to emphasise the* ***equivalent standards across different UK doctorates. This can be best demonstrated by showing that doctoral candidates face the similar intellectual changes both during their programme and at the point of final examination.*** "

(Source: UK Quality Code, Framework for England and Wales and Doctoral Characteristic)(Emphasis added)

Table 4: Requirements of International Standard Classification of Education (2011) Level 8

Requirements	(§259) Leads to **an advanced research qualification** and are devoted to advanced study and original research. **Typically offered only by research-oriented tertiary educational** institutions such as universities. Doctoral programmes exist in both **academic and professional fields.** **(260)** ISCED level 8 **usually concludes with the submission and defence of a thesis , dissertation or equivalent written work of publishable quality, representing a significant contribution to knowledge in the respective field of study** . Therefore, **these programmes are typically based on research and not only on coursework.** In some education systems, **ISCED level 8 programmes contain very limited course work ,or none at all** , and individual working towards a doctoral degree engage in research mostly independently or in small groups with varying degrees of supervision. In some education systems, doctoral research is undertaken by individuals employed by the universities as junior researchers or research assistants , in addition to their being enrolled as doctoral students. (261) Entry into ISCED level 8 programme or junior research positions normally requires the successful **completion of specific ISCED level** 7 programmes. (262) Programme classified as ISCED level 8 may be referred to in many ways , for example: PhD , DPhil , D. Sc, LL.D , Doctorate or similar terms. **However, it is important to note that programmes with a similar name to 'doctor" should be only be included in ISCED level 8 if they satisfy the criteria described in Paragraph 263**. For international comparability purposes, the term 'doctoral or equivalent level 'is used to label ISCED level 8.
Classification Criteria	(263) For the definition of doctoral or equivalent level, the following criteria is important **Main Criteria** (a) Written work requirements (see paragraph 264) (b) Entry requirements (see paragraph 261) (c) Minimum duration of level (see paragraph 265) **Subsidiary criteria** (a) Doctoral degree / qualification required for specific occupations (see paragraph 266) 264. Successful completion of an ISCED Level 8 programme requires the **submission of a thesis, dissertation or equivalent work of publishable quality that is the product of original research and represents a significant contribution to the field of study**.265. ISCED level 8 requires at least **three years of full time** equivalent study , making a **total cumulative duration of at least seven years of full time education at tertiary level.** 266 . Achievement of an ISCED level 8 qualifications is often a condition for entering into faculty posts in educational institutions that offer ISCED level 6. 7 and 8 programmes, **as well as research posts in government and industry. Complementary dimensions** (§268) One dimension may be used to differentiate education programmes at ISCED level 8: (§269) Programme orientation (see paragraph 270) Programme orientation • **Academic; and** • **Professional.**

Source: International Classification of Education (2011) (emphasis added)

2.1. Malaysia

With regards to Malaysia, the two documents that require scrutiny and study are the Malaysian Qualification Framework (MQF) 2.0 and the Standards for Masters and Doctoral Degrees (Standards). On a side point, it is noted that though the draft version of MQF 2.0 did initially adopt suggestions (Balasingam U, 2016) to introduce a classification for honours for degree level in alignment with international benchmarking this was not followed through in the final version of MQF. Hence, on this point at this level of degree too there is a divergence from United Kingdom and Australia on level descriptors. It is noteworthy to reflect on the regulatory bodies perception of doctoral degree wherein under the draft all three routes of doctoral degrees were initially referred to PhDs. The final draft makes the distinction of PhD, mixed mode and coursework at doctoral level.

2.2. Research Doctoral Degree Only for PhD

It is clear that the doctoral level requires new knowledge which is predicated upon research whether by way of academic PhD or professional doctoral degree. It is also important that professionals in the work place are encouraged to seek doctorate and transform their work place with new knowledge research outputs.

But para 89 of the MQF reserves the term research degree for Phds. This is also contrary to the Appendix 2 Level 8 requirements of the and para 88 and 87 of the MQF 2.0.The differentiation is also reflected in the Standards document.

It is reported that between 1990 -2010 there is a tenfold increase in Masters and Phd enrolment. This increased Malaysia to the 3rd ranking behind Singapore and Thailand in the southeast asia region. (Ministry of Education Malaysian Education Blueprint (2015-2025). Malaysia is on the paper chase to produce 60,000 PhD holders by 2023. A sum of RM 2.58 billion is allocated towards this end. (The Sun Daily, 2014) There is a seemingly a focus on academic doctorate.

2.3. Entry Requirement

The entry requirement of any masters' degree accepted by HEP is deregulating the role of the quality assurance agencies and arguably diluting quality assurance standards. It allows the HEP the financial benefit to take in students without discrimination or consideration of the ability or capacity of the foundational knowledge to attain the highest level descriptor is not in accordance with general rule under ICSED (para 261) that it requires as a general rule **completion of specific ISCED level 7** programmes.

Table 5: Standards Entry requirements

Doctoral Degree by research coursework and Phd by Mixed Mode	A master's degree accepted by the HEP Senate or other qualifications equivalent to a master's degree that are acceptable by the HEP Senate.

Source : Malaysian Masters and Doctoral Standards

The MQF 2.0 also in para 86 only requires a masters degree for a doctoral degree. In the table above it will be noted that contrary to the MQF 2.0, the Standards mixed-mode is designated as Phd (not doctorate). It is more disturbing that that there is no general requirement for a specific masters' qualification. This runs contrary to the ICSED general rule that require completion of specific ISCED level 7 programmes. It is understandable that for any given courses like DBA and Ed.D the entry requirement can be more generic as it is considered as an application of the any existing masters degree to an area of professional practice that is diverse within the fields of business and education. Hence, it is sought to be topped up with more coursework (in different relevant subjects for the area of practice) are required for the area of study without

compromising the thesis/dissertation requirement. These are exceptions than the general rule. These exceptions have been recognised in other jurisdictions. But to supplement the exception into the general rule is a step that should not be taken so lightly as the implications or consequences to quality is serious and significant.

The Framework for Higher Education Qualifications of England Wales and Northern Ireland Degree Awarding Body Part A (2014) recognises that there is a need for progression between levels in the definition of framework levels which is " *A series of sequential stages (a development continuum) expressed in terms of a range of generic outcomes against which typical qualifications can be positioned."* This is related to the need for specific or relevant entry requirements [(academic or experience (professional route)] as a general rule as advanced in this paper. Exceptions should only be allowed or authorised through proper scrutiny by the quality assurance agencies when approving any programmes based on stated criteria.

It is not defensible to lay the onus to self-regulation or the professional bodies as it delegates or abdicates the role of agency in rule setting for quality assurance.

2.4. Differentiation Between the Routes

The Phd programmes undergo research methods courses, but there is no credit assigned. The minimum requirement of 80 credits for both mixed mode and course work detracts the equivalency of the same when the mixed mode under the Standards is additionally required to produce a thesis/ dissertation that is externally examined. The coursework programme under the Standards is internally assessed and with no thesis/ dissertation requirement as required by the DMQF 2.0 herself. This, in itself, compromises the route of coursework within the DMQF 2,0 framework.

Instead the standard requires a research project that invariably will fall short of the measure to attain the output expected of the doctoral level outcomes in research which is imposed on all doctorates. In any event it is recognised by ICSED that **these doctoral programmes are typically based on research and not only on coursework.** Likewise UK and Australia do not recognise a coursework route. This is because a taught coursework programme can only aspire to a masters' level outcome descriptors.

Table 6 : Selected Provisions Malaysian Qualification Framework 2.0

Descriptor	**Level 8 Doctoral**
Summary of Learner Profile	The doctoral degree is the highest qualification,. However it does not include Honorary doctorates. Demonstrate **critical understanding of the most advanced knowledge** which is at the **frontier of a field of study or professional practice. Independently conduct, manage and lead** advanced research which contributes **to substantial new and original knowledge** and /or professional practice. Note: Normally in the form of **thesis (new) advanced professional practice (new), advanced technologies**, creative models or work of art or music. (para 87)
Examples of Qualification of titles	The qualifications titles are in the forms of a PhD for research-based programmes and Doctoral Degree for mixed-mode or coursework-based programmes. (para 89)
Entry Requirement	A masters or equivalent qualification (para 86) with exceptions for bachelors research masters initial completion to convert to Phd.
Minimum credits	Mixed mode and coursework based programmes (min 80 credits) . Phd no credit requirement
Minimum duration	Normally 3 years full academic year (para 86)

LO:Knowledge	Demonstrate understanding which is comprehensive, systematic integrated and undertake critical analysis and synthesis of new complex and abstract ideas of current critical issues in the **most advanced frontiers of knowledge of a field of study or discipline or practice** and related principles , theories, practice or techniques /technology : Make **substantial / significant contribution / through the creation /production /innovation of new knowledge /theories /practices/solutions** which can **satisfy peer reviews** meeting **international standards** through **communication in international referred journals.** Demonstrate through critical analysis, evaluation and synthesis expert knowledge in specific fields and practice.
Output	**Para 88** **The output generally is in the form of a thesis/dissertation in a specific field or professional practice or performance based/ creative art forms .** This reflects the various types of doctoral programmes which have been developed in the system and it includes the **traditional PhD, practiced based PhD, professional and PhD by publication.**

(Source Malaysian Qualification Framework 2.0) (Emphasis added)

2.5. Discrepancy Between DMQF 2.0 and the Standards

It is also to be highlighted that the MQF and Standards are not consistent. It is suggested that this is because there is a lack of clarity of what is meant by terminology like research, professional degree and academic degree within the MQF 2.0 and Standards. It is also suggested there is a bias towards academic Phd that is reflected in the documents and pathways.

Table 7 : Nomenclature of Postgraduate Degrees Awarded under the Standard

QSualification	Mode		
	Research	Mixed Mode	Coursework
Master's	MPhil	MPhil	Master's degree according to field of specialisation
Doctorate	PhD or Professional Doctorate	PhD	Doctoral Degree according to field of specialisation eg DBA, D Ed , D Eng
Post Doctorate	DSc, DEng Sc	Not applicable	Not applicable

(Source : Malaysian Standards Masters and Doctoral Degree)

Table 8 : Examination requirements under the Standard

Doctoral Degree by research	For PhD, including PhD by published work , the thesis must be examined by at least 3 examiners, 2 of whom are external examiners.
Phd by Mixed Mode	Thesis must be examined by at least 2 examiners. I of whom is an external examiner.
Doctoral degree by coursework	Internal

(Source : Malaysian Standards Masters and Doctoral Degree)

Some may argue that the mixed mode method is the most challenging as it requires the undertaking of coursework aimed to elevate the capacities of the doctoral student and yet be required to produce a thesis for external examination to satisfy the level research outcomes of doctoral student's new knowledge creation.

But nonetheless,

1. As seen above, the research doctorate term is guarded for Phd when the level descriptors in the MQF 2,0 and international standards require it for all doctorates, where there a common level descriptor and standing for all doctoral degree
2. The Standards refer to mixed –mode as Phd, but the MQF 2.0 refer to it as doctorate.
3. The post-doctoral in the Standards is only permissible for Phd.
4. The term professional doctorate in the Standards is placed under Phd. The accepted international categorisation of research doctoral degrees like DBA and EdD are instead classified as coursework doctoral degree.
5. The creation and differentiation of routes like Phd mixed mode and course work with different standards are artificial and are not focused on the objectives of translating research outcomes into the industry. . This is contrary to the two clear equal and commonly assessed routes of professional and academic doctorates as per international standards and the ICSED,
6. The level descriptor outcome is one common one across all doctorates, but this is compromised in the standards set and differentiated for the three routes.
7. Para 88 MQF 2.0 introduce undefined terms like traditional Phd, practiced based Phd and professional Phd whereas the Standards has the term industrial Phd (defined) which is not covered in the MQF 2.0. There is no mention of coursework degree here, but it is mentioned in the Standards. The concept of academic degree and professional degree and the environment in which it is attainable is also in need of clarity.
8. The MQF 2.0 lacks the real and practical emphasis on attainment of the graduate research attributes and the interlinkages of research outcomes to industry which are the clear needs in the current age.

3. Research, Academic and Professional Doctorate

The definition of research is that it increases knowledge and develops new innovations. It can be basic (acquire new knowledge without any particular use) (academic) or applied (acquire new knowledge for a special aim or experimental systematic thought and work to improve or produce new materials or processes or systems (UK Quality Code Part B 11 Research Degree).

Hence, the original knowledge value creation is crucial and this component of independent research (under both routes proven by thesis and external examination and standards) is emphasised.

A professional doctorate student wills likely conduct applied or experimental research that would better serve the industry in the way that translates to economy outputs. Hence, it is not proper for Phd to monopolise the assertion that it is the only form of research doctorate. In fact the move forward is to get more candidates from the professional or industry or academia to conduct research to heighten human capital and the economy in general and not just to increase the quantity of doctorate students in the higher education market.

Professional Doctorates per the UK Doctoral Characteristic statement (p7) is that

"in professional and practice based doctorate the research may be undertaken in the workplace and may have a direct effect on improving the professional practice of individuals and their host organisation."

Traditional Academic doctorates

PhD and DPhil is restricted to qualifications where assessment is solely by a final thesis or published work; or by artefact, composition or performance that is accompanied by a written commentary placing it in its academic context. (UK Doctoral Characteristic p 36 ,6.20)

4. Synergy Between Industry and Academia

The connection between a doctoral degree to the industry is crucial. In a survey conducted in a UK institution from 2003 to 2006 involving 268 doctoral students and 96 employers of the doctoral students, it was found that over 75% of the employers value the contribution of the doctoral students and 20% would consider them a critical aspect of the business in that their absence would affect the functionality of the business (Diamond, 2014). The report provides examples of a multitude of ways in which the doctoral students have contributed to innovation. Case examples include improved telecommunication products, detection of cybercrime, creating new flavours in the food industry, reducing multiple births resulting from fertility treatment, an iPad allowing users to explore exhibits in a museum and speeding up assessment of financial claims.

The doctoral graduates also boost the credibility of the organisation in acquiring new clients and resources and providing solutions in more effective and competitive way. It was also reported that 75% of the doctoral students were involved in collaborative projects, promoting knowledge exchange between the university and the industry. Employers are satisfied with the cutting-edge knowledge and ideas that are applied for commercial benefits.

It is also a reality that the higher education needs independent funding. The growth of higher education no longer solely exists in pursuit of knowledge per se. There is a need for the knowledge to be funnelled into socio-economy by collaboration with the industry that is ready to invest into research for improvements not only of products or services but also limitless transformation and innovations for the benefits of mankind. Hence, all doctoral students are researchers (academicians and practitioners alike) who are tied somewhat to industry and challenged to make an impact within their own sphere of research. Even academician PhD holders are required to get grants or projects that are linked to industry. The need to sustain research excellence and translate it to the industry is necessary to bring benefits to the social, economic and wellbeing of any country.

A study conducted on the career paths of UK doctoral graduates found that about 49% of doctoral graduates are not in academia but in the industry three and half years after graduating, 19% work in higher education research while 22% are in Higher Education teaching or lecturing (Vitae, 2010). The point is that if funding for research is to be derived from sponsors (not government) the quality of researchers and facilities are key factors. The industry will only sponsor their candidates (professional doctorates) and/or academic researchers for a project if there is positive returns and impact.

Relatively easy access to higher education and availability of funding by the government to enhance the quantity (with muted emphasis on quality) of doctoral degree holders in Malaysia will result in excesses in numbers of doctoral graduates for the traditional academia career in universities. Some, based on the experience in the UK, may end up as post-doctoral students on contract who find it difficult to get an academic position. Hence, many doctoral graduates need to be employed outside the academia. The acid test is whether they are able to fulfil the level descriptors that they are quality assured to deliver to the employers. If they are so equipped,

then they will be an asset; but if not, then they will find it difficult to survive in an industry that demands and expects more from them based on the qualification descriptors.

In this regard, some lessons can be derived from the World Bank World Development Report (2018) where it is noted that schooling is not the same as learning. In the Vitae Report (2016), post-doctoral researchers or research fellows in the UK who gave up the ambition to be in academia due to limited positions are employed in a wide range of occupations. Many still work in areas supporting the research system. In their new jobs, satisfaction is high with over 80% being satisfied with their current job and, out of 78% that aspired for an academic career, only 18% would go back. It also shows the limited need for doctoral holders in the academia.

Nearer home, the Singapore Education Minister (Yojana Sharma, July 2017) has made it clear that universities will play a major part in transforming knowledge into new business and new jobs.

5. European Collaborative Doctoral Programmes

The European University Association (2016) advocated the development of institutional structures for doctoral education and underlined the importance of original research in making doctoral education distinct. It is stated that that institutional leadership is necessary to make research a central part of doctoral education.

The emphasis is on building research capacities with the goal for the development of a research culture characterised by rigour, resilience, originality, critical thinking, independence and ability to create new knowledge. This culture should be enhanced by exposing doctoral candidates to different disciplinary approaches and research environment within their field. The need for universities to engage with industry through placement or in collaborative doctoral programmes is also highlighted. The challenges include developing an ethos of research integrity, big data, open research, online learning, and digital skills.

The study into collaborative or joint doctoral programmes with industry was also conducted by the European University Association (2015a). The report concluded that the primary motivation and incentives for universities to plan collaborative programmes with industry are to improve the quality of doctoral education and institutional reputation, stimulate university-industry dialogue, exposure to wider research environments, enhance employment prospects of doctoral holders and their social status, attract more diversified funding from external organisations for research, respond to growing industrial demand for access to new generated knowledge and better integration in the European Research Area. The point remains that the thirst is for the new generated knowledge founded upon research within industry irrespective of whether it is via a collaborative programme or professional doctorates.

The motivation for industry to be involved in the collaborative doctoral programmes includes increasing competitiveness, viewing university-business collaboration as part of the company strategic plans, broadening research funding sources, accessing cutting edge research and technological developments, tackling industry challenges, and enhancing the quality of recruitment pool available to the company. The European University Association (2015b) highlighted four dimensions of good practices which emphasizes research capacity and capability, international profile, international structures and mobility. The importance of investment and development of the human resource is formally recognised within Research Excellence Framework and European Commission Horizon 2020.

6. Doctoral Degree Awarding Powers

According to ISCED, the doctoral programmes are typically offered by selected educational tertiary institutions with research capacities. It is to be noted that in the UK, there is a distinction in qualification awarding power given to higher education providers between taught

degree programmes and research degree programmes. This is to ensure that the research outcomes of education are quality assured and higher education is not commercialised into quantity and not quality (Department for Business, Energy and Industrial Strategy, 2018).

Taught degree awarding powers give higher education providers the right to award bachelor's degrees with honours and other taught higher education qualifications, but not postgraduate research degrees which are reserved for universities that have been given research degree awarding powers. This is also the case in United States, there is also doctorate granting institutions (divided into very high research activity, research activity and research institutions) which are to be differentiate from other degree awarding body (QAA,Cultures of Quality, 2015).

7. Options for a Doctoral Candidate

Given the same credit requirements, research requirements, examination and standing a doctoral candidate has three options.

(a) Taught coursework with minimum of 80 credits internally assessed even with a research project (seemingly degree level) that arguably falls short arguably the level descriptor of a doctoral degree but placed at doctoral level.

(b) mixed mode option that requires a minimum of 80 credit taught coursework and a further one external examined dissertation but given a lesser non-research status when the dissertation too need to be subjected to the external examination (less one external examiner) for fulfilment of common level descriptors research outcomes. This is usually undertaken by mid-level industry professional to enhance their capacity in certain coursework areas and yet contribute to original research in the professional environment. Note the mixed mode route is much heavier than coursework route that only requires 80 credit and nothing more . This is unlike the mixed mode where 80 credit is just 50 % of the course requirement .

(c) a PhD or designated research degree that according to the MQF 2.0 has no credit for taught courses (not even research methods done but which is not accounted for) which requires a supervised thesis in academic environment but a similar level of scrutiny in external examination as mixed mode save the one added external examiner.

Option (a) arguably seems to commercialise doctoral degrees without quality assurance as to the requisite common doctoral level descriptors in the MQF 2.0 especially on research outcomes. This is a major concern that this paper seeks to highlight that there should not be a coursework doctoral degree. In fact it is the argument that the structure of the same in the Standards fall short of the requirements of the level descriptors under the MQF 2.0 itself. Further entry requirements left free to the Senate to decide.

The quality of Malaysian higher education needs to be safeguarded. The higher status accorded to option (c) perhaps is an indirect manner to channel all potential students to a study of PhD and not the mixed mode which arguably may be equated to a professional degree. This however does not accord it proper recognition and status. It negates, detracts and does not recognise or encourage this “mixed mode route” or rather professional degree route which is needed as there is the need to transform the industry by doctoral candidate research outputs working in the industry with new knowledge and added value. The creativity of design of such courses should be a challenge that should be embraced.

Conclusion

In the interest of ensuring the quality of doctoral degrees in Malaysia, the best option is perhaps to create two equivalent pathways – academic PhD and professional doctoral degree. This is in accordance with the UK, Australia, ASEAN and ISCED frameworks. The learning outcomes should place an emphasis on new or original knowledge contribution and they must be common

to both pathways. There should not be any biasness or prejudice over the labelling of doctoral degree as research and the other as not when the outcome requires research contribution for all doctoral degrees. It is to be based on merit and common quality assured outcomes of the same standard and examination with proven research activity in the industry environment as well as in academia.

The current MQF 2.0 and Standards that have differentiated standard requirements and assessment to cater to the different modes should be re-examined as it compromises the common level descriptor underlying all doctoral degrees. The coursework mode should not be featured at the doctorate level in light of international benchmarks. Therefore, it is humbly suggested that MQF 2.0 and Standards be reviewed for consistency within these documents. It also needs to be reviewed and benchmarked against the UK, Australia, ASEAN and ICSED frameworks.

The paper ends with a reminder of the caution by Chigisheva, Bondarenko, and Soltovets (2017) that it is not in the trend of qualifications framework that is important but the assured outcome of the educational quality improvement at the requisite doctoral level.

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