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Twelve Tips on Pursuing a Master of Science Degree for Malaysian Medical Graduates and Their Supervisors

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ABSTRACT

In Malaysia, prolonged unemployment following graduation has resulted in a growing interest among medical graduates in pursuing postgraduate research. This article offers educational resources in the form of 12 tips for medical graduates who plan to pursue a postgraduate science degree and their supervisors. It emphasises the reciprocal mentor–mentee relationship in the academic pursuit of a research project. This article is based on the author's personal experience of enrolment in a Master of Science (MSc) degree immediately upon completing the Doctor of Medicine programme combined with relevant educational theories. The 12 tips are arranged according to study progression from enrolment decision to the implementation of the research project. The author addresses the frequently asked questions of medical graduates. A learner-centred approach to research supervision is advocated. The educational challenges faced by research supervisors are discussed and approaches presented that may inform teaching efficacy to promote the agency of research supervisors. Pursuing a postgraduate research degree is a growing trend among new medical graduates in Malaysia. This article collates available literature and the author's critical reflection to provide a practical framework that caters to the lack of formal educational resources specific to medical graduates in the MSc programme.

Keywords: *Unemployment, Gap year, Graduate medical education, Research, Mentoring*

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INTRODUCTION

In recent decades, an enormous influx of local and international medical graduates has overwhelmed the Malaysian healthcare system, creating an unprecedented rate of prolonged periods of unemployment between graduation and compulsory internship training (1). The career uncertainties of Malaysian junior doctors

have been further compounded by a contract employment scheme intended to shorten the time between graduation and housemanship (HO). Currently, the waiting time can range from six months to a year, and the COVID-19 pandemic has added more gloom to the situation. The issue of medical unemployment is not new to the profession. Similar problems have occurred in many developed nations (2–3).

Academics have even suggested that non-clinical careers may be a solution for some of these jobless graduates (4).

This trend in Malaysia has led a growing number of medical students to contemplate postgraduate research degrees. This can be motivated by an intrinsic interest in medical research and the desire to create a competitive curriculum vitae (CV) for future employment and specialisation training. Higher education institutions (HEI) welcome these enthusiastic graduates as their enrolment provides them with more graduate students, tuition fee revenues and prospective research output. However, these key performance indicators are the results of the corporatisation of HEI and political pressure to raise local HEI to global quality, which inevitably turns the university degree into a commodity (5). Therefore, as “smart consumers”, medical graduates should make an informed choice about joining a postgraduate study programme.

I write this article as the first medical graduate from the Universiti Sains Malaysia (USM) to take the untrodden journey of pursuing a Master of Science (MSc) immediately after obtaining a Doctor of Medicine (MD) while waiting for an internship. My insight on the topic has been obtained through my experiences advising other students and graduates who wish to follow suit. In so doing, I have come to understand their concerns and worries, and have had the good fortune to observe the successful completion of their master’s degrees. The publication of postgraduate science education tips has been documented and generally influenced by subjectivity based on the academic context of the intended readership (6–7). Therefore, Malaysian medical graduates who wish to pursue an MSc might face a unique set of challenges. This article focuses on information aimed at supporting the collaborative academic supervision relationship between Malaysian medical graduates and their supervisors in the MSc programme. The target audience includes,

but is not limited to, prospective MSc candidates, their advisers and junior faculty performing research.

TIP 1: RECOGNISE THE DIFFERENCES BETWEEN VARIOUS MASTER COURSES

The research-based MSc programmes are postgraduate degrees where students engage with specialised fields of knowledge and conduct research in their chosen field. This may include drafting proposals, securing grants and ethical clearance, planning, implementing and revising protocols, collecting and analysing data, and communicating their findings through oral presentation or scholarly publication of a written research report. However, an MSc programme may be part-time or full time; require on-campus attendance or distance learning; be local or overseas and consist of research, coursework or a combination of the two. Therefore, the MSc degree is not an exclusively research-based mode of study. It is advisable to research potential courses on university websites and to make enquiries at the admission office of the respective HEI or the Malaysian Qualifications Register.

Furthermore, the MSc programme differentiates itself from the clinical master programmes (MMed) or international professional membership diplomas such as Membership of the Royal Colleges of Physicians; the latter two are postgraduate clinical training programmes for professional practice. An MSc does not confer listing on the National Specialist Register as an indexed clinical specialist. However, a mixed-mode MSc merges structured teaching contents with a shorter research project towards the end of the study to develop a thesis. Although non-clinical graduate education and clinical specialisation appear to be mutually exclusive, both the Edinburgh Declaration and Good Medical Practice emphasise the relevance of medical research to a

physician's professional career (8–9). A recent systematic review that examined the outcomes of Master-level education among health practitioners indicated that master programmes improve key professional attributes, such as critical thinking, clinical reasoning, collaboration and communication (10). Nonetheless, readers should exercise caution when interpreting the aforementioned literature synthesis given that the primary studies included were deemed to be of low to moderate methodological quality with non-physicians as subjects and the master programme was mostly conducted in developed nations.

TIP 2: DETERMINE PERSONAL AND PROFESSIONAL PRIORITIES

Pursuing postgraduate research demands time, money and substantial intellectual and emotional engagement. The MSc students are required to work closely with their supervisor and the university for a period of between one and four years to obtain an MSc. They will also need to pay tuition fees at regular intervals, which are estimated to range from RM10,000 to RM60,000 per academic year, depending on the country in which the university is located. As a medical graduate, one has dedicated oneself to at least five years of medical education with a taxing curriculum, likely far from home. Some may have to pay their medical programme tuition fee debt despite not yet being employed as house officers. Others may wish to spend more time with their family before they begin intensive internship training. Notably, a part-time MSc programme may span up to five years of matriculation, which provides greater project completion flexibility and minimises disruption to personal and professional commitments. Therefore, a medical graduate should weigh the decision to pursue an MSc against all other factors to ensure a work-life balance most beneficial to their well-being. Tip eight will explore this point further.

The exponential development of science and technology (S&T) shapes a volatile, uncertain, complex and ambiguous human capital market. Hence, there is no particular critical skill that will help in securing employment and fostering cross-disciplinary competencies may help maintain competitiveness (11). Nevertheless, situational awareness of the national S&T policies, such as the Science & Technology Foresight Malaysia 2050 (12) and 10-10 MySTIE framework (13) on neurotechnology, biotechnology, digital technology, nanotechnology and green technology, could guide career planning. Otherwise, medical graduates may wish to explore other options for effectively sharpening their CV if the primary concern is future employability. The Eleventh Malaysia Plan (5) and Malaysian Education Blueprint (14) prioritise the use of information and communications technology in learning. They promote technical and vocational education and training to improve the marketability of the local labour force. Furthermore, HEI, business corporations and the Human Resources Development Fund organise Massive Open Online Courses that provide training in essential employment skills. Otherwise, industrial experience in a non-medical field can hone leadership and entrepreneurial skills and generate income. It is important to recognise that an MSc may not be an infallible solution to career uncertainties.

TIP 3: JUSTIFICATION FOR PURSUING FURTHER STUDY

A retrospective survey among USM graduates in the last two decades revealed a mutually exclusive relationship between non-clinician MSc degree holders and clinician MMed degree holders (15). The underlying dynamics of this peculiar situation has not been investigated to date. The possible implication of this phenomenon is such that whenever a medical graduate pursues an MSc,

others may form an implicit judgement that they are forgoing a clinical career, which could be a disadvantage during clinical job application. Nonetheless, it is speculated that the future academic profile of Malaysian medical doctors will become more diverse as medical graduates saturate the clinical job market and that additional graduate education will form a part of employment consideration, emulating the development in high-income nations (16). Furthermore, there is lack of evidence suggesting that completing an MSc degree leads to improved patient outcomes. Although research among the nursing community signalled potential positive effects of an MSc degree on patient care (17), it is uncertain whether this data is applicable to physicians and should be considered while deciding on further studies.

Therefore, it is advisable to reflect on how an MSc degree would contribute to the desired career plan. A strong justification motivates a favourable attitude and provides the focus needed to successfully complete an MSc. Both MSc candidates and supervisors should capitalise this recommendation that is based on the self-determination theory, focusing on the fulfilment of three basic psychological needs of autonomy, competence and relatedness in sustaining motivation throughout the programme (18). Although considerations such as the likability of lecturers, the availability of research grants and finding a supervisor who is prominent and reputable in one's chosen field appear important to prospective postgraduate students, they will not be the prime concern. Choosing a research field that evokes academic curiosities and enthusiasm towards bridging the existing knowledge gaps relevant to career goals should precede other considerations. For instance, a medical graduate who wishes to venture into academia may consider an MSc in a related discipline. Evidence from an American study found that having an MSc in neurosurgery was associated with a future academic career among resident graduates (19).

With level-headed forethought, an MSc candidate will not be easily frustrated by obstacles during and after the postgraduate programme. Having long-term goals in mind can fuel determination to circumvent any lack of financial support during the programme that precludes attending a significant conference or workshop. If one hopes to join academia upon completion of MSc and internship training, perseverance and grit can steel against frustration due to a lack of suitable vacancies or being underqualified without a PhD. The essence of study justification will be what a medical graduate can gain from an MSc and how it can contribute to their career.

TIP 4: MAKE AN INFORMED CHOICE

After reviewing the first three tips, tailored information is needed to guide decision-making. Prospective MSc candidates may want to discuss study plans with trusted and impartial parties such as family, friends and significant others. The decision should be made with full consideration of available resources, level of academic commitment, the expected duration of the MSc and its effect on the continuity of medical career. The medical programme accredited in Malaysia aims to produce competent graduates able to work as house officers. Therefore, most medical graduates who choose to pursue an MSc while waiting for a placement will later resume their profession as medical doctors. The prospective MSc supervisor of medical graduates should consider the legality of medical practice when negotiating an individualised research project agenda.

In Malaysia, a full registration certificate and a valid annual practising certificate are required to practice medicine. Both of these are issued by the Malaysian Medical Council (MMC) for legal and independent medical practice. The Medical (Amendment) Act 2012 stipulates that successful completion of an HO placement is the only way to obtain these documents.

Therefore, medical graduates who wish to pursue both an MSc and full MMC registration should carefully coordinate their training timeline. An in-depth discussion with an academic adviser can help in deciding whether to take an MSc before, after or concurrently with HO placement. Those not wishing to complete an HO residency will need to abide by the legal limitations imposed on their professional practice. The key message is to weigh the pros and cons of further studies against commitment to a clinical internship.

TIP 5: SOCIALISE AND LEARN ABOUT ACADEMIC CONVENTIONS

There is a discernible difference in the epistemological stance of medical undergraduate and MSc education. Research has found that Malaysian medical students are inclined to view knowledge as definite and originating from authoritative sources (20). However, a postgraduate science education, which is usually based on the adult learning theory, presents knowledge as non-didactic, less organised, more authentic, multifaceted and loaded with uncertainties (10). Medical educators should debate this disparity given the unsettled discussion of whether failure to achieve the aspired outcome-based education during undergraduate study or a sheer progression of graduate attributes from level six to seven of the Malaysian Qualification Framework (MQF) is accountable (21).

Thus, new medical graduates on MSc programmes are vulnerable to imposter syndrome (22), which is a sense of oneself as occupying a role fraudulently due to feelings of inadequacy. There is a need to adjust to the new academic culture, conventions, and values and to develop new interpersonal relationships within the MSc community. Socialising within the academic community enables the student to establish their identity within this new role and helps them to build a network in their field of study. This advice

builds upon the social learning theory, which posits that vicarious learning and modelling within a social context supports self-efficacy and motivation in the scientific quest (23). Students may achieve this by shadowing lecturers, exploiting social media platforms or participating in postgraduate student organisations. Postgraduate education cultivates independence and critical engagement with genuine issues leading to novel perspectives or solutions (24).

TIP 6: UTILISE ESSENTIAL RESOURCES

The MSc student needs to make full use of resources such as academic workshops, scientific meetings, conference funds, scholarships opportunities and student services. In addition, they should be aware of the bureaucratic process behind their postgraduate study. The official procedures of different administrative departments relevant to their studies may not be synchronised. For example, the frequency of ethics committee meetings will not necessarily complement the dates for proposal defence sessions or the deadlines of funding bodies. At times, it can be confusing for newcomers to navigate between departments and there is little assistance with this. The postgraduate institute manages candidature progress, the faculty preside over academic matters, and the registrar processes student data.

Therefore, postgraduate students are advised to seek the assistance of senior students or supervisors on this matter at the beginning of enrolment to organise their study workflow and make contingency plans if the original strategy fails to work as intended. Sticky notes, calendar reminders or timeline charts can be helpful. Supervisors must be aware that medical graduates may not be as well-versed in the practicalities of research as their Bachelor of Science (BSc) counterparts. For instance, the technical skills involving acquisition

and analysis of experimental data. Timely clarification and guidance will prevent unnecessary productivity loss or delays that could interfere with the student's schedule for subsequent HO training. Through strategic management of the obstacles faced during graduation using available resources, essential 21st century skills can be developed to address future professional duties (11).

TIP 7: IDENTIFY AND MANOEUVRE AROUND THE RULES

This is not encouragement to cheat or flout the rules. Rather, it concerns the formal and informal regulations to which one must adhere to minimise academic conflicts in completing the MSc. The crucial rules involve the criteria for graduation. These usually include compulsory scholarly communication of research output in terms of journal publications and conference presentations. This policy aligns with the national aspiration for Malaysian universities to attain world-class status. MSc students should familiarise themselves with the detailed criteria specifications, such as the number, type and indexing status of journal publications. For example, students must publish an original article in an academic journal that is indexed in Scopus® or the Web of Science™ before their thesis defence. Again, once a suitable journal is identified, one must adhere to their guidelines for article submission, which commonly include screening for plagiarism, and this must be incorporated into the MSc study timeline. Academic integrity substantially contributes to a scientific career, and there are commercially available software tools to cross-check the written work.

It is also important to recognise any taboos and to notice the management climate within the research group or among the faculty. It seems arbitrary, but unnecessary hurdles could be avoided if one sidesteps organisational politics. Usually, these

unwritten rules concern resource sharing, ownership of novel research hypotheses and conflicts of interest between academics. In a way, this experience may be regarded as leadership training in the handling of conflicts. It is also worth noting that previous research has identified a prevailing trend towards academic misconduct among Malaysian healthcare academics (25). Therefore, medical graduates should abide by the medical oath (26) and the MMC Code of Professional Conduct (27). These will equip them with correct intentions and help them to maintain academic integrity during their MSc study.

TIP 8: TAKE CARE OF ONESELF AMID CHALLENGES

The high prevalence of mental health issues among medical students has been well-characterised by a large body of research publications (28–29). Furthermore, graduate students also demonstrate a high risk of clinical depression and anxiety (30). Health-seeking behaviours among the sufferers in these demographics are disproportionately low. This may relate to the stigma associated with psychiatric disorders. Therefore, medical graduates pursuing MSc study could be subjected to a significant amount of implicit psychological stress. In addition to their effects on quality of life, mental illnesses impair productivity and may adversely affect the prospect of MSc study completion. It is prudent to promptly seek professional advice when graduate students are experiencing symptoms suggestive of mental illness, such as overwhelming emotions and sleeping or eating disturbances, interfering with daily activities. Depending on the university setting, one may have access to pastoral care, counselling, academic support services, self-help groups and wellness centres. From there, further psychiatric intervention can be recommended when required, protecting students' confidentiality and offering study-related adjustments.

A healthy work-life balance is essential to well-being; however, this may be easier said than done (31). At the fundamental level, graduate fellows should take care of physical health, which should be maintained through optimal nutrition and exercise of adequate intensity, frequency and duration. Mindfulness or meditation can be utilised in the management of stress, self-worth should be maintained by taking time to engage with hobbies and interest groups (32–33). Meaningful interpersonal connections should be cultivated to provide a sense of belonging, which can be a powerful psychological buffer. Nevertheless, work institution (34), academic culture (35) and relationships with research supervisors (36) have been shown to affect graduate students' emotional well-being. Therefore, mental health within the scientific community should involve the collective commitment towards psychological safety.

TIP 9: HONOUR MSc LEARNERS

The supervisor–supervisee relationship has been a topic of ongoing psychological and leadership research for its possible implication on graduate students' feedback and academic performance (37). As the consumer of such evidence, it is desirable to reflect on our preference, perceived supervision dynamics and processes (38). For instance, a South African faculty framed research supervision as an educational endeavour through reflexive practice and humanised research-based teaching and learning through the application of pedagogical research evidence (39). The humanistic approach to higher education maintains that learners have an inherent propensity towards success that educators' support should complement their achievements.

When supervisors aim to meet their students' psychological needs for autonomy, competence and relatedness they contribute to more than just the student's well-being. Self-determination theory suggests

that this also promotes the student's intrinsic motivation and self-regulation (40). As detailed in tips two to four, medical graduates bring their goals, career aspiration, and capabilities into an MSc, and educators need to acknowledge these. It can be tempting to impose one's own ideology, values, preferences and agenda onto one's supervisee. However, doing so undermines the student's motivation and reduces their sense of personal volition. Supervisors must create a learning environment that supports students' capacity to internalise relevant academic values voluntarily. The role of the research mentor should be to facilitate the student's developing competence in independent research inquiry (41).

TIP 10: NEGOTIATE REALISTIC EXPECTATIONS AND A CHALLENGING LEARNING CONTRACT

This tip is an extension to tips six and seven. The mentor and student create a learning contract comprising sequential checkpoints towards MSc graduation. It is imperative to have explicit mutually agreed upon outcomes with expectations set at a high but achievable level. In the context of Malaysian higher education, the stipulated outcomes include the achievement of graduate attributes at MQF level 7 for MSc graduates (21) with a scientific output to fulfil the quality assurance procedures. Two independently conducted systematic reviews and meta-analysis demonstrated that various interventions aiming at increasing publication output yielded only weak evidence of effectiveness (42–43). Nevertheless, regular progress meetings with the research supervisor are opportunities for iterative feedback in the mentoring relationship.

Constructive feedback is a critical element of high-quality higher education and requires the commitment of both mentor and mentee. Transparency between the supervisor and student with regard to

the required performance fosters self-regulation of independent learning (44). The move away from a teacher-centred learning approach should foster the students' locus of control and prevent student frustration at goals imposed by an external force. The value of regular progress updates that address learning needs and gaps lies in building the student's agency and capacity for self-assessment (45). In a sense, the lecturer is an experienced colleague facilitating the learner's academic achievement.

TIP 11: KNOW WHEN TO STEP IN (AND WHEN TO STAND BACK)

The tasks of a supervisor described in tips nine and ten seem daunting as they demand that the supervisor renounces a great deal of control. Traditionally, academic advisers' perspectives on research supervision have received less attention in the literature. A qualitative investigation among cross-disciplinary supervisors' educational practice revealed the diverse pedagogical approaches in graduate study supervision (46). The supervisor–student relationship is complex and ubiquitous in the supervisor's career, with themes revolving around professional boundaries and collegial interaction in academic activities. Nonetheless, the emphasis of teacher's efficacy as an educator and belief in the capacity of their interventions to positively influence the student are vital to both supervisor and student alike (47). Micromanaging hampers the self-regulation process and consumes a considerable amount of the tutor's energy. On the other hand, an aloof emotionally distant research supervisor can leave the MSc student in limbo. Having either an indifferent or an uncompromising mentor can produce anxiety in the student and adversely affect their mental health. The supervisor must decide the extent to which it is beneficial to tolerate some foreseeable mistakes in order to provide learning opportunities for the student. This can be important because trial and error

are part and parcel of real-life research activity. However, in each instance, the supervisor must carefully weigh the cost of the anticipated failure against the decision to intervene.

TIP 12: CELEBRATING THE ACHIEVEMENTS OF STUDENTS AND SUPERVISORS

This last tip is about appreciating the project progression as the collaborative outcome of the hard work by students and supervisors. Research accomplishments imply career advancement: for the lecturers, the bearing of research output promoted further investigation or real-world application of findings; for students, study completion brings them into the next phase of training or employment. Although this article has elaborated extensively on student-centred learning, the supervisors have to work relentlessly behind the scenes to ensure students learn as planned. The capability of a research supervisor to guide students strategically in completing a project with available resources reflects the teacher's agency in their professional practice (48). Lecturers who take pride in students' research accomplishments may derive greater career satisfaction against academic burnout. This attitude is essential to withstand the administrative pressure for quality, accountability and impactful higher education within the Malaysian context.

CONCLUSION

In summary, this article has collated my personal experience and a review of educational theories into 12 tips for medical students wishing to pursue an MSc before HO training. They cater specifically to Malaysian medical graduates contemplating an MSc, and their supervisors. I have endeavoured to deliver a balanced perspective and to convey some of the ambiguity and vulnerability integral to postgraduate science education. It is

hoped that this article helps prospective MSc candidates to make informed decisions about their academic endeavours.

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