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Cultivating A Future-Ready Health Workforce: Aligning Bachelor of Medical and Health Sciences Programme Outcomes with Malaysian Qualifications Framework for Advanced Competencies

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Abstract

The Programme Learning Outcomes of the Bachelor of Medical and Health Sciences programme at Open University Malaysia have been strategically developed to provide graduates with the necessary skills and information required for their future professional endeavours. Nevertheless, further investigation is needed to empirically explore the efficacy of these Programme Learning Outcomes within the practical realm of professional settings. The objectives of this study are (1) to assess the efficacy of the Bachelor of Medical and Health Sciences' Programme Learning Outcomes in improving the skills and abilities of its graduates, as perceived by those who have completed the program, and (2) to examine the extent to which Programme Learning Outcomes are congruent with industry demands, as well as their influence on the professional growth and career advancement of graduates. The research utilised a quantitative questionnaire to gather data from alumni of the Faculty of Technology and Applied Sciences, Open University Malaysia. The obtained data were analysed to evaluate the significance, suitability, and influence of the Programme Learning Outcomes on the alumni's career paths and professional development. The findings indicate favourable responses, as seen by the high mean ratings for critical competencies, especially in clinical skills, teamwork, and lifelong learning. The quantitative abilities domain, particularly in solving mathematical or statistical problems, needs further focus, as seen by the lower mean score and greater response variability. This study offers significant insights into the efficacy of Programme Learning Outcomes in equipping graduates for their future professional endeavours. This statement emphasises the significance of ongoing assessment and adjustment of the curriculum to ensure that it remains in line with industry standards and meets the needs of graduates. The results of this study have the potential to provide valuable insights for the construction of future curricula and add to the ongoing academic discussion around outcome-based education within the higher education context.

Keywords: alumni feedback, graduate competencies, Malaysian Qualifications Framework, program outcomes, Programme Learning Outcomes.

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1. Introduction

The domain of higher education has consistently undergone transformations to suffice the ever-changing needs of the global labour market and technological breakthroughs (Markaryan & Mezinova, 2023). Aligned with this pace, the Faculty of Technology and Applied Sciences at Open University Malaysia (OUM) is at the forefront of this evolutionary process. The faculty is dedicated to providing education that transmits academic information and enhances practical skills and capabilities. The Programme Learning Outcomes (PLOs) of the Bachelor of Medical and Health Sciences (BMHS) programme are of utmost importance, as they encompass the fundamental competencies anticipated of graduates. The decision to prioritise the BMHS's PLOs is driven by the growing emphasis on outcome-based education (OBE) across the higher education landscape. OBE redirects attention from conventional instructional approaches to the tangible results of the educational experience. This strategy guarantees that the education provided focuses not only on exam success but also on imparting students with practical and significant skills applicable to real-life situations (Thirumoorthy & Muneeswaran, 2021). In the realm of medical health sciences, it is imperative to comprehend the effectiveness of these educational results, given the dynamic and influential nature of this profession. This descriptive study was designed to evaluate the programme's success in providing students with crucial future-ready abilities such as critical thinking, digital literacy, and ethical reasoning, which are critical for healthcare professionals in a fast-changing medical field. This entails assessing how the programme nurtures these competencies and analysing how well students are equipped to address the difficulties and possibilities of their future professional activity.

2. Literature Review

Evaluating PLOs in higher education has become vital in ensuring the quality and relevance of academic programmes (Hamm et al., 2018). PLOs play a pivotal role in shaping the instructional goals of higher education institutions (Ammar & Rais, 2021). According to Saleem and Gouse (2019), it is crucial to highlight that PLOs serve as a means to clearly define the anticipated competencies, understanding, and dispositions that students should acquire by completing their educational programme. Competence is a combination of traits, qualities, talents, and knowledge. It is necessary to have pre-service education, in-service training, and work experience in the healthcare industry. Compliance with diverse clinical, non-clinical, and interpersonal standards plays a crucial role in the performance of healthcare providers. Determining a health worker's ability and readiness to deliver high-quality care requires measuring competency. Even though competence is necessary to complete tasks, it's crucial to regularly assess performance to see if workers are making the most of their competence at work. (Brits et al., 2020). Having a college degree or above, being able to adjust to technology advancements quickly, and applying training-acquired information and skills creatively are characteristics of highly skilled labour. Those engaged in the production, advancement, transmission, and application of knowledge are, at their core, skilled workers. (Janis et al., 2021)

The notion of PLOs is not novel within the academic domain. It embodies an exhaustive compilation of competencies and proficiencies that students are anticipated to attain upon culminating a designated academic curriculum (Saleem & Gouse, 2019). The results encompass a spectrum of proficiencies, including specialised technical abilities within the Technology and Applied Sciences domain, as well as broader competencies like critical thinking, problem-solving, and effective communication (Taib et al., 2017). Similarly, according to Spady (1994), implementing PLOs represents a transition towards OBE, wherein the educational approach centres on students and their attainment of certain competencies. Accreditation authorities, such as the Malaysian Qualification Agency (MQA), assume a crucial role in the supervision and management of PLO implementation. The standards and regulations established by the MQA guarantee that educational programmes conform to national and international quality standards through the Malaysian Qualifications Framework (MQF). The pivotal role played by these entities in shaping PLOs is of utmost significance in upholding educational eminence (Ammar & Rais, 2021). MQF 2.0 is an

enhanced methodology for higher education in Malaysia, structured into five separate clusters, which collectively cover eleven essential learning outcomes.

These clusters embody a comprehensive approach to ensuring that graduates possess the necessary skills and knowledge to effectively navigate the complexities of the contemporary world (Malaysian Qualifications Agency, 2019). The first cluster, "Knowledge and Understanding," focuses on gaining in-depth information and understanding of various disciplines of study. It involves learning goals centred on mastering a body of information in a given topic and an appreciation for the interdisciplinary components of a field of study. The second cluster, "Cognitive Skills," focuses on critical thinking, analysis, and problem-solving skills. This cluster strives to improve students' capacity information to assess information critically, articulate arguments, and solve issues while also encouraging creativity and innovation in the development of new ideas and solutions and increasing competence in successfully managing and utilising information. The third cluster, "Practical Skills," emphasises knowledge application and the development of hands-on abilities. This includes acquiring digital literacy skills for the successful use of digital tools and technology, and expertise in applying knowledge in practical and professional contexts.

The fourth cluster, "Interpersonal Skills," is dedicated to developing social skills, communication, and teamwork. It entails improving efficient oral and written communication skills and cultivating teamwork and leadership skills. Finally, the fifth cluster, "Ethical, Professionalism, and Personal Development," emphasises the need to instil values, ethics, and a commitment to continual personal and professional development. This includes adhering to ethical ideals, professional standards, and a dedication to lifelong learning and personal development. Overall, the framework of MQF 2.0, with its integrated approach across all five clusters, guarantees that graduates are not only academically competent but also have the necessary soft skills, ethical basis, and lifelong learning attitude. This holistic approach prepares graduates to effectively handle career challenges and make important contributions to society (Malaysian Qualifications Agency, 2019). Within this framework, the study's goal is to evaluate the effectiveness of the PLOs for the Bachelor of Medical and Health Sciences programme in terms of how well graduates' skills and abilities are perceived by individuals who have finished the programme. In addition, this research intended to investigate the degree to which PLOs align with industry requirements and their impact on graduates' professional development and career progression.

Subsequently, the educational system is directed to modernise and create new forms of educational process construction by the widely accepted concept of lifelong learning. The most promising specialised training and retraining method is distance continuous education since it is adaptable, dynamic, and satisfies market demands (Tsarapkina et al., 2021). Expanding the base of university education by providing opportunities to diverse sectors of society, particularly those without access to education, has led to a boom in demand for open university education and educational technology, which are the foundations of open education (Al-Malah et al., 2020). Online education is becoming a practical way to get professional training. Educational institutions must take proactive steps to guarantee that the goals of people wishing to obtain the required certifications through open distance learning are fulfilled since the demand for these programmes has grown over the past ten years (Paniagua & Simpson,2018). In many nations, the number and appeal of continuing online education programmes in the medical and health sciences are rising. Comprehending them could facilitate the development of these initiatives, enhancing their efficacy. Additionally, developing and orienting online programmes is facilitated by a grasp of the perspectives and preferences of online learners.

Growing complexity is the result of the increased demand for medical and health professionals to have access to online learning options. In addition to changing their pedagogical approaches, medical and health faculty face the difficulty of creating medical and health education curricula that address the growing need for medical professionals and the requirements of today's students (Sandhu et al., 2021). Academic medical and health programmes must constantly update curricula to reflect the rapidly evolving nature of professional medical practices. Medical and health programmes aim to educate practitioners who can deliver safe, high-quality treatment and adjust to shifting practice

circumstances (Sourial et al., 2022). In Malaysia, developing a future-ready health workforce through distance learning entails developing an innovative educational ecosystem that fully utilises technology. This strategy entails creating complete online curricula regularly updated with the most recent medical developments, including simulation and virtual reality for practical training, and promoting a collaborative learning environment via digital platforms (Nurfaradilla Mohamad Nasri et al., 2020).

A system like this allows healthcare professionals to access global insights, engage in remote mentorship, and participate in continual professional development while working around their schedules. Emphasis on digital literacy and technology integration trains students to use modern healthcare resources efficiently. At the same time, modules on ethical principles and cultural competency ensure that services are respectful of Malaysia's broad cultural terrain. This plan not only democratises access to high-quality medical education, particularly for people living in distant locations, but guarantees that Malaysia's healthcare staff remains agile, knowledgeable, and prepared for the changing healthcare demands in the digital era (Jiménez et al., 2020). In technology and applied sciences, the development of PLOs involves the deliberate consideration and resolution of industry-specific requirements. Stange (2020) highlights the significance of incorporating technical proficiencies alongside soft skills, such as critical thinking and collaboration. The significance of this integration within technology and applied sciences degrees is essential in equipping graduates for a swiftly expanding market. However, it is crucial to acknowledge that the alignment of PLOs with industry requirements is critical in their effectiveness and in ensuring that graduates are well-equipped to meet professional challenges (Kaar et al., 2018). However, this alignment is not static; it requires ongoing curriculum development to keep up with industry advancements.

The introduction of the Bachelor of Medical and Health Sciences with Honours at OUM in 2018 is a noteworthy achievement in advancing medical education in Malaysia particularly in the assistant medical officers' profession. The initiative exemplifies the university's dedication to broadening healthcare education accessibility through open and online learning methods and produced its first batch of approximately 200 graduates in 2023. The Faculty of Technology and Applied Sciences offers 17 accredited academic programmes from diploma to PhD level. The BMHS programme has been intended for healthcare professionals in the public and private sectors since 2018. Within the framework of the BMHS programme at the OUM, the aforementioned results have been customised to address the particular requirements and obstacles encountered in medical and health sciences. The PLOs for the BMHS programme were carefully formulated following the Standards and Guidelines for the Medical Assistant Education Program 2018 to ensure they comply with the MQF 2.0 (Medical Assistant Board, 2018). This three-year BMHS curriculum is tailored to focus on registered Assistant Medical Officers (AMOs), emphasising flexibility and accessibility by teaching theoretical material online via Google Meet, allowing students to balance their education with their careers without taking any study leave.

In the long run, the programme is intended to raise the professional profile of AMOs in Malaysia. Ensuring that 75% of AMOs have bachelor's degrees by 2030 is one of the initiative's main goals, as stated in the Assistant Medical Officer Professional Development Plan 2016–2030. This gallant goal demonstrates a dedication to enhancing AMO credentials and capabilities, which will raise the standard of healthcare services the nation provides. The BMHS became one of two degrees accredited by the Medical Assistant Board and Public Service Department Malaysia in 2023 (Ministry of Health, 2021). The curriculum includes themes such as pre-hospital emergency care, surgical and medical care, trauma and emergency, occupational safety and health, geriatric rehabilitation, and palliative care. According to Figure 1, 200 of the 882 students enrolled in BMHS had completed their studies. This has resulted in around 15% of Malaysia's assistant medical officers holding a bachelor's degree from an Open Distance Learning university (Open University Malaysia, 2022).

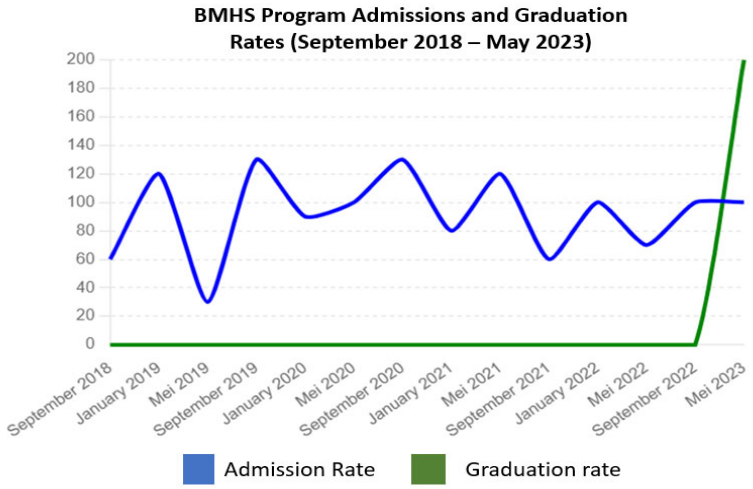

Figure 1. Admission and graduation rates for the BMHS programme from September 2018 to May 2023

Nevertheless, the evaluation of the efficacy of PLOs presents distinct obstacles. The evaluation method that is considered the most direct and potentially beneficial involves gathering comments from individuals who have directly experienced the programme, specifically the alumni. The input from alumni offers valuable insights regarding the extent to which the PLOs have been effectively applied in practical contexts. The significance of this matter is particularly pronounced within the realm of medical health sciences, whereby the acquisition of practical skills is essential to supplement academic knowledge (Cornes et al., 2022). The predominant composition of medical personnel within the Malaysian Ministry of Health (MOH) consists of assistant medical officers. They are more susceptible to errors in their day-to-day tasks if they lack professional competence, as their duties and responsibilities become more complex. In addition to transforming the work environment of health care professionals, medical knowledge and technology have also introduced novel and difficult treatment methods and procedures.

Public awareness of the necessity for safe, effective, and cost-effective medical treatment has also been elevated due to the accessibility of medical information via the Internet, periodicals, and other forms of media. The fact that medical institutions are facing a growing number of legal actions and complaints demonstrates that these demands are true (Ministry of Health, 2019). Furthermore, healthcare professionals must explore viewpoints promoting healthcare professional education (Burgess et al., 2020). They should thoroughly examine the fundamental nature of healthcare knowledge, competencies, and the philosophical principles that form the basis of professional healthcare education. By prioritising healthcare professional education and competencies, educators can overhaul the curriculum, instructional techniques, learning goals, and evaluation procedures. This will empower them to not only supplement recognised pragmatic opinions but also to redefine the curriculum, instructional approaches, learning objectives, and evaluation systems with a more comprehensive examination of theoretical frameworks and competencies (Youn, 2021).

3. Research Methodology

This study aimed to analyse the quantitative alignment of BMHS programmes with specified PLOs in the medical and health sciences field. The goal is achieved by collecting empirical data to establish alignment and find significant differences among graduates and practising medical assistants. This study utilised a cross-sectional research methodology, specifically focusing on collecting and analysing quantitative data entirely. The cross-sectional design enables a momentary evaluation of the alignment among participants, including individuals who have successfully completed their education in BMHS programmes.

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Structured questionnaires specifically designed by OUM for the respondents were used to collect quantitative data. These questionnaires contain items created to evaluate perceptions of congruence between education programmes and specific PLOs. PLOs outline the important information, abilities, and competencies students should gain during their education. The surveys were designed to assess participants' perceptions using 5-point Likert-scale items provided through an online survey platform, Google Forms. Participants were instructed to evaluate their level of agreement or disagreement with statements on the alignment.

The survey was conducted between October 14th and November 19th, 2023, and the required sample size was reached on November 18th, 2023. Using the Raosoft sample size calculator, a sample size of 130 was calculated based on an expected 50% response rate, a 95% confidence interval, a Z-score of 1.96, and a 5% error margin. Descriptive statistics, such as mean and standard deviation, were used to summarise participants' replies and assess their alignment.

4. Findings and Discussion

The dataset has a preponderance of male respondents (n = 112, or 86.15% of the total) and female respondents (n = 18, or 13.85%) in gender distribution. Upon analysing the years of professional experience, it is shown that the most prevalent duration is 12 years, with 16 respondents (12.31%) falling under this group. Additional notable experience durations include 7, 8, and 13 years, each with 13 responders, accounting for 10% of the total. The distribution of work experiences exhibits a wide spectrum, encompassing a significant proportion of respondents with extensive experience and individuals with comparatively fewer years in the workforce. There is a wide range of income distribution among the respondents. With 38 responses (29.23%), the largest group has an income between RM 50,001 and RM 70,000. This is closely followed by 34 people (26.15%) in the RM 35,001 to RM 50,000 range. In the meantime, thirty-two respondents (24.62%) fall into the category of respondents making less than RM 20,000, while twenty-one respondents (16.15%) make between RM 20,001 and RM 35,000. The dataset shows that the higher income brackets, 100,001 to RM 250,000 and RM 70,001 to RM 100,000, are the least represented, as shown in Table 1.

Table 1. Respondent's Demographic

		N (%)
Gender	Male	112 (86.15)
	Female	18 (13.85)
Ages (years)	25-34	62 (58.5)
	35-44	37 (34.9)
	45-54	6 (5.7)
	>55	1 (0.9)
Profession	Assistant Medical Officer	130 (100)
Working experience	Less than 5 years	2 (1.55)
	6 years to 10 years	54 (41.86)
	11 years to 15 years	50 (38.76)
	16 years to 20 years	14 (10.85)
	Over 21 years old	9 (6.98)
Annual Income	Less than RM 20,000	32(24.8)
	RM 35,001- RM 50,000	33(25.58)
	RM 50,001- RM 70,000	38(29.46)
	RM70,001-RM 100,000	2(1.55)
	RM 100,001 - RM 250,000	3(2.33)

The descriptive analysis of variables 1 through 19 in the given dataset, as presented in Table 2, shows an interesting pattern with mean values ranging from 4.48 to 4.72. If the factors are scored equally, this trend indicates a general tendency towards higher scores on the scale. Variables 5 (*Ability to demonstrate the knowledge, skills, attitudes, and behaviours required to perform a range of clinical procedures*

competently and safely in the medical assistant field) and 12 (*Ability to understand the responsibility as a working group member*) strike as particularly important. The two items with the highest average values, 4.70 and 4.72, which indicate a more positive response or higher ratings from respondents, are 14 (*Ability to understand the needs and to engage in self-improvement and lifelong learning*). Conversely, variable 11 (*Ability to interpret and solve problems using mathematical or statistical knowledge*) has the lowest mean value of 4.48, indicating a little less positive but still elevated perception.

Contrastingly, variable 14 (*Ability to understand the needs and to engage in self-improvement and lifelong learning*) has the least variation (0.47) of all the variables, indicating consistency in the replies. On the other hand, variable 11 (*Ability to interpret and solve problems using mathematical or statistical knowledge*) has the lowest mean and the biggest standard deviation of 0.60. This increased variability indicates a wider range of replies and a greater diversity of opinions or ratings for this item. However, the standard deviations of these variables, which range from 0.47 to 0.60, are rather low in variability.

Table 2. Respondents' Perception of their achievement level

No.	Perception of your achievement level (*Variables*)	PLO	Mean	SD
1.	Ability to acquire medical & health science knowledge	1	4.68	0.50
2	Ability to generate ideas for solutions	2	4.62	0.56
3	Ability to analyse problems effectively	2	4.61	0.55
4	Ability to apply tools and methods for the solutions.	2	4.58	0.54
5	Ability to demonstrate the knowledge, skills, attitudes, and behaviours required to perform a range of clinical procedures competently and safely in the medical assistant field	3	4.70	0.51
6	Ability to understand the fundamental concepts of interpersonal skill	4	4.65	0.54
7	Ability to demonstrate good relationships with all stakeholders through effective communication in a work-related environment	4	4.63	0.54
8	Ability to develop good networking with other healthcare professionals and active collaboration with stakeholders	5	4.68	0.53
9	Ability to demonstrate strong skills in retrieving relevant information and actively engaging in research activities, enable to contribute meaningfully to academia, professional environments, and the broader pursuit of knowledge	6	4.58	0.57
10	Ability to understand and work with numbers	7	4.58	0.54
11	Ability to interpret and solve problems using mathematical or statistical knowledge	7	4.48	0.60
12	Ability to understand the responsibility as a member of a working group	8	4.70	0.51
13	Ability to function as a leader/manager in a working group	8	4.65	0.54
14	Ability to understand the needs and to engage in self-improvement and lifelong learning	9	4.72	0.47
15	Ability to use the learning for academic and career progression	9	4.71	0.50
16	Ability to integrate entrepreneurial skills in medical and health practices	10	4.62	0.55
17	Ability to diversify the medical and health practices with the contemporary health needs of the nation	10	4.58	0.57
18	Ability to demonstrate confidence in clinical decision-making on complex issues based on critical thinking	11	4.62	0.57
19	Ability to uphold ethical and professional values to improve clinical interventions with adherence to professional code of practice	11	4.62	0.55

The consistently high mean scores across all categories suggest a generally good or favourable response from the participants, indicating that the subjects or aspects covered by these variables are highly esteemed. The uniformly small standard deviations indicate the participants' consensus or shared perspective.

In addition, the consistently high mean scores (4.48 to 4.72) across all variables show a generally positive response to the programme's components, particularly clinical competence, team duties, and self-improvement. Variable 11, which is related to mathematical or statistical problem-solving, has a somewhat less favourable view and the most variability in responses. This indicates a need for targeted improvement in this area (PLO 7).

Overall, the results suggest that although the curriculum is generally well-regarded, there is potential for improvement in quantitative skills, particularly in practical skills and lifetime learning. Participants' agreement on most programme elements indicates a high match with industry norms and professional expectations. To guarantee that medical and health science professionals receive a well-rounded, future-ready education, curriculum improvement, opportunities are highlighted by minor differences in some areas.

Furthermore, although the aforementioned findings offer a beneficial synopsis of the data's attributes, they lack particulars such as intricate distribution characteristics, possible outliers, or latent patterns. As such, this finding functions as an initial phase, albeit one that is instructive. Additional investigations, such as correlation studies, inferential statistical testing, or detailed distribution analyses, may result in a more comprehensive understanding.

5. Conclusion

The study indicates that graduates in the BMHS programme hold the programme in high respect, especially regarding clinical abilities, teamwork, and self-improvement. The respondents' varied demographic and socioeconomic backgrounds offer a thorough understanding of the programme's effects. However, the study also points to the need for a stronger emphasis on quantitative skills, as seen by the variation in answers to problems involving arithmetic or statistics (PLO 7). The programme's alignment with industry norms and regulations is commendable, indicating that graduates are adequately equipped to meet the professional needs of the healthcare sector. Future-ready health education requires OUM's flexible education paradigm. This strategy comprises curriculum evaluation and improvement to meet technology and patient demands. For students with different schedules and commitments, OUM provides numerous learning methods. It trains assistant medical officers with current knowledge and adaptability for vital roles in universal health coverage. Advanced technologies like simulation-based training ensure practical skills. OUM emphasises lifelong learning and offers professional development to keep graduates competitive in the ever-changing healthcare sector.

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