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

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Abstract

Background: The Programme Learning Outcomes (PLOs) of the Bachelor of Medical and Health Sciences (BMHS) program at Open University Malaysia (OUM) 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 PLOs within the practical realm of professional settings. Objective: The objective of this study is to assess the efficacy of the Bachelor of Medical and Health Sciences' Program Learning Outcomes (PLOs) in improving the skills and abilities of its graduates, as perceived by those who have completed the program , examine the extent to which Program Learning Outcomes (PLOs) are congruent with industry demands, as well as their influence on the professional growth and career advancement of graduates. Methods: The research utilizes quantitative surveys to gather data from alumni who have graduated from the Faculty of Technology and Applied Sciences, OUM. The obtained data were analysed to evaluate the significance, suitability, and influence of the Program Learning Outcomes (PLOs) on the career paths and professional development of the alumni. Results: The findings indicate that respondents responded favourably, 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. Conclusion: This study offers significant insights into the efficacy of Program Learning Outcomes (PLOs) in equipping graduates for their future professional endeavours. This statement emphasizes 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, programme learning outcomes, Malaysian Qualifications Framework, lifelong learning in healthcare, future ready health education

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1.   Introduction

The domain of higher education has consistently undergone transformations, according to the ever-changing needs of the global labour market and breakthroughs in technology. (Markaryan, & Mezinova, 2023). 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 not only transmits academic information but also enhances practical skills and capabilities. The Programme Learning Outcomes (PLOs) of the Bachelor of Medical and Health Sciences (BMHS) program are of utmost importance, as they serve to encompass the fundamental competences that are anticipated of graduates.

The notion of Program Learning Outcomes (PLOs) is not novel within the academic domain. It embodies an exhaustive compilation of competencies and proficiencies that students are anticipated to attain upon the culmination of a designated academic curriculum (Saleem & Gouse,2019). The results encompass a spectrum of proficiencies, including specialized technical abilities within the domain of Technology and Applied Sciences, as well as broader competencies like critical thinking, problem-solving, and effective communication (Taib et al,2017). Within the framework of the Bachelor of Medical and Health Sciences (BMHS) program at the Open University of Malaysia (OUM), the aforementioned results have been customized to address the particular requirements and obstacles encountered in the fields of medical and health sciences.

The decision to prioritize the BMHS's Program Learning Outcomes (PLOs) is driven by the growing emphasis on outcome-based education (OBE) across the higher education landscape. Outcome-Based Education (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.

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 program, specifically the alumni. The input from alumni offers valuable insights regarding the extent to which the Program Learning Outcomes (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 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 indeed true (MOH, 2019).

The educational system is directed to modernize and create new forms of educational process construction by the widely accepted concept of lifelong learning. The most promising method of specialized training and retraining is distance continuous education since it is adaptable, dynamic, and satisfies market demands (Tsarapkina et al., 2021). The concept of 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). It is imperative that educational institutions 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 programs has grown over the past ten years (Ng, 2011).

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The introduction of the Bachelor of Medical and Health Sciences with Honours at Open University Malaysia (OUM) in 2018 is a noteworthy achievement in the advancement of medical education in Malaysia particularly to 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. This descriptive study was designed to evaluate the program'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 program nurtures these competencies and analysing how well students are equipped to address the difficulties and possibilities of their future professional activity.

2.   Literature Review

The evaluation of Programme Learning Outcomes (PLOs) in higher education has become a vital element in ensuring the quality and relevance of academic programs (Hamm,Madison, & Murnane,2018). Program learning outcomes (PLOs) play a pivotal role in shaping the instructional goals of higher education institutions (Ammar& Rais, 2021). According to Saleem & Gouse (2019), it is crucial to highlight that Program Learning Outcomes (PLOs) serve as a means to clearly define the anticipated competencies, understanding, and dispositions that students should acquire by the time they complete their educational program. According to Spady (1994), the implementation of Program Learning Outcomes (PLOs) represents a transition towards Outcome-Based Education (OBE), wherein the educational approach centres on students and their attainment of certain competences.

Within the field of technology and applied sciences, the development of Program Learning Outcomes (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.

The alignment of PLOs with industry requirements is a critical factor in their effectiveness. Alignment with industry standards ensures that graduates are well-equipped to meet professional challenges (Kaar et al, 2018). This alignment is not static; it requires ongoing curriculum development to keep up with industry advancements.

The Malaysian Qualifications Framework (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 aimed at 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 as well as 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 to critically assess information, 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 utilizing information.

The third cluster, "Practical Skills," emphasizes knowledge application and the development of hands-on abilities. This includes acquiring digital literacy skills for successful use of digital tools and technology, as well as expertise in applying knowledge in practical and professional contexts.

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The fourth cluster, "Interpersonal Skills," is dedicated to the development of social skills, communication, and teamwork. It entails improving efficient oral and written communication skills as well as cultivating skills in teamwork and leadership.

Finally, the fifth cluster, "Ethical, Professionalism, and Personal Development," emphasizes the need of instilling values, ethics, and a commitment to continual personal and professional development. This includes adhering to ethical ideals and professional standards, as well as 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 learning outcomes (PLOs) for the Bachelor of Medical and Health Sciences program in terms of how well graduates' skills and abilities are perceived by individuals who have finished the program. In addition, this research intended to investigate the degree to which Program Learning Outcomes (PLOs) align with industry requirements and their impact on graduates' professional development and career progression.

Accreditation authorities, such as the Malaysian Qualification Agency (MQA), assume a crucial role in the supervision and management of Program Learning Outcome (PLO) implementation. The standards and regulations established by the Malaysian Qualifications Agency (MQA) serve to guarantee that educational programs conform to both national and international quality standards. The pivotal role played by these entities in shaping Program Learning Outcomes (PLOs) is of utmost significance in upholding educational eminence (Ammar & Rais, 2021).

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. (Kak et al, 2001). Human resources comprise competent individuals who now hold positions in professional, technician associate professional, or leadership/management, according to International Labour Organization (2014). Having a college degree or above, being able to quickly adjust to technology advancements, 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. (Burgess, 2021).

Online education is growing in popularity as a practical way to get professional training. In many nations, the quantity and appeal of online continuing education programs 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 programs is facilitated by a grasp of the perspectives and preferences of online learners. Growing in 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 both address the growing need for medical professionals and the requirements of today's students (Sandhu, Gill, & Singhal, 2021). Academic medical and health programs must constantly update their curricula to reflect the rapidly evolving nature of professional medical practises. Education for practitioners who can deliver safe, high-quality treatment and who can adjust to shifting practice circumstances is the aim of medical and health programs (Sourial et al., 2022).

In Malaysia, developing a future-ready health workforce through distant learning entails developing an innovative educational ecosystem that fully utilizes technology. This strategy entails creating complete online curricula that are regularly updated with the most recent medical developments, including

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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, while modules on ethical principles and cultural competency ensure that services are respectful of Malaysia's broad cultural terrain. This plan not only democratizes access to high-quality medical education, particularly for people living in distant locations, but also guarantees that Malaysia's healthcare staff remains agile, knowledgeable, and prepared for the changing demands of healthcare in the digital era (Jiménez et al.,2020).

The Faculty of Technology and Applied Sciences offers 17 accredited academic programs spanning from diploma to PhD level. The Bachelor of Medical and Health Sciences with Honours (BMHS) program is intended for health care professionals working in both the public and private sectors. A BMHS curriculum for assistant medical officers was designed in 2018 to help them improve their academic qualifications, professionalism, and career choices. The curriculum is considered Malaysia's first degree-level program in health and medicine. 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 admitted to BMHS have completed their studies. This has resulted in around 15% of Malaysia's assistant medical officers holding a bachelor's degree from an ODL university.
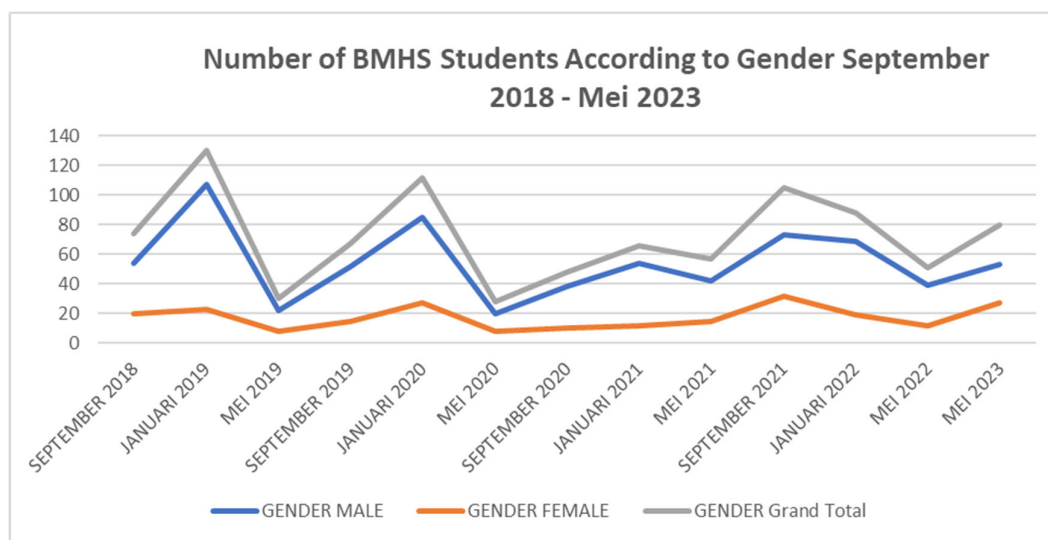

Figure 1. Total Admission and Graduates of BMHS in Open University Malaysia, 2018 - 2023

Furthermore, educators in healthcare professions should thoroughly examine the fundamental nature of healthcare knowledge, competencies, and the philosophical principles that form the basis of professional healthcare education. By prioritizing healthcare professional education and competences, educators can overhaul the curriculum, instructional techniques, learning goals, and evaluation procedures. It is imperative for educators in healthcare professions to explore viewpoints that promote healthcare professional education (Burgess et.al, 2020). This will empower them to not only supplement recognized 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)

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3. Research Methodology

The purpose of this study was to analyse the quantitative alignment of BMHS programs with specified program learning objectives (PLOs) in the medical and health sciences field. The study's goal collects empirical data in order to establish the degree of alignment and find any significant differences among graduates. Medical assistant training is essential for preparing healthcare personnel to satisfy the demands of the medical and health sciences professions. Program Learning Outcomes (PLOs) outline the important information, abilities, and competences that students should gain during their education. It is critical to ensure alignment between educational programs and PLOs in order to provide quality healthcare services and develop competent professionals. This study utilized a cross-sectional research methodology, with a specific emphasis on collecting and analysing quantitative data entirely. The cross-sectional design enables a momentary evaluation of the alignment among participants. The study included individuals who have successfully completed their education in BMHS programs. Structured questionnaires specifically designed by OUM for the respondents were used to collect quantitative data. These questionnaires contain items specifically created to evaluate perceptions of congruence between education programs and specific PLOs. The surveys were designed in an organized manner to assess participants' perceptions using 5-point Likert-scale items. Participants were instructed to evaluate their level of agreement or disagreement with statements pertaining to alignment. Participants were provided with questionnaires through internet survey platforms using Google forms. The survey was conducted between October 14th 2023 till 19th October 2023, and the required sample size was reached on 18th November 2023. The survey was conducted between October 14th 2023 till 19th October 2023, and the required sample size was reached on 18th November 2023. Raosoft calculated a sample size of 130 based on a 50% response rate, a 95% CI, a Z of 1.96, and a 5% margin of error. Descriptive statistics, such as mean and standard deviation, were utilized to summarize participants' alignment responds.

4. Results & 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 terms of gender distribution. Upon analyzing the years of professional experience, it is shown that the most prevalent duration is 12 years, with a total of 16 persons (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, as well as 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. 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)

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		N (%)
Working experience	Less than 5 years 6 years to 10 years 11 years to 15 years 16 years to 20 years Over 21 years old	2 (1.55) 54 (41.86) 50 (38.76) 14 (10.85) 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)

Table 2. Respondent's 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 the 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
No.	Perception of your achievement level (*Variables*)	PLO	Mean	SD
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 descriptive analysis of variables 1 through 19 in the given dataset, as shown 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 member of a working group*) strike as particularly important. The two items with the highest average values, 4.70 and 4.72, which indicate a

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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*) stands out as having the lowest mean value of 4.48, indicating a little less positive but still elevated perception.

The standard deviations of these variables, which range from 0.47 to 0.60, are rather low in terms of variability. 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 a consistency in the replies. On the other hand, variable 11 (*Ability to interpret and solve problems using mathematical or statistical knowledge*), which had the lowest mean and the biggest standard deviation of 0.60. This increased variability indicates that there was a wider range of replies and a greater diversity of opinions or ratings for this item.

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 a consensus or shared perspective among the participants.

In addition, the consistently high mean scores (4.48 to 4.72) across all variables show a generally positive response to the program'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, as well as the most variability in responses. This indicates a need for targeted improvement in this area (PLO 7).

The results suggest that although the curriculum is generally well-regarded, there is potential for improvement in quantitative skills, particularly in the areas of practical skills and lifetime learning. Participants' agreement on the majority of program 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 the minor differences in some areas.

Although the aforementioned findings offer a beneficial synopsis of the attributes of the data, 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 investigation, such as correlation studies, inferential statistical testing, or detailed distribution analyses, may result in more comprehensive understandings.

5.   Conclusions

The study indicates that graduates in the Bachelor of Medical and Health Sciences program hold the program in high respect, especially when it comes to clinical abilities, teamwork, and self-improvement. The respondents' varied demographic and socioeconomic backgrounds offer a thorough understanding of the program's effects. The study does, however, also point 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 program's alignment to industry norms and regulations is commendable, indicating that graduates are adequately equipped to meet the professional needs of the healthcare sector. However, the dynamic and ever-changing healthcare landscape, characterized by continuous technology progress and changing patient demands, necessitates a continuous process of assessment and curriculum enhancement. Ensuring pertinence and efficacy in such a rapidly changing domain is vital, necessitating a dedication to ongoing enhancement and adjustment of instructional material and pedagogical approaches. This will guarantee that upcoming graduates possess not just expertise in their present positions but also the necessary skills to adjust and flourish in the constantly evolving healthcare environment especially in non-physician role such as the assistant medical officers' profession in promoting universal health coverage and be the fore front together with the physician profession in providing medical and health services.

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