



Original Article

## Developing a preliminary questionnaire for the faculty development programme needs of medical teachers using Delphi technique

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### المخلص

**أهداف البحث:** تهدف هذه الدراسة لتطوير استبانة أولية لبرنامج تنمية قدرات أعضاء هيئة التدريس بكلية الطب من خلال جولتين لتقنية دلفي.

**طرق البحث:** استخدمت هذه الدراسة تقنية دلفي في الفترة من إبريل إلى يونيو ٢٠١٩ حيث تم عمل المقابلات وجها لوجه ومراجعة الأدبيات لاقتراح مجموعة من المجالات والعناصر لاحتياج برنامج تطوير أعضاء هيئة التدريس لمعلمي الطب. تم دمج جولتين من تقنية دلفي للحصول على إجماع على الاستبانة المقترحة بواسطة ١٠ من فريق الخبراء في مجالاتهم. وتم تعريف الإجماع المحدد مسبقا على أنه يعني النتيجة أربعة أو أعلى ونسبة اتفاق تساوي ٧٥٪.

**النتائج:** في البداية، تم اقتراح أربعة مجالات و ٢٦ عنصرا. في النهاية، تم التصديق على ستة مجالات و ٣٨ عنصرا من فريق الخبراء. تتضمن المجالات المختارة ستة كفاءات تتضمن التعليم، والتقييم، والأبحاث، والمنهج، والنشر، وخدمة المجتمع. تتكون هذه المجالات من سبعة، وتسعة، وستة، وسبعة، وأربعة، وخمسة عناصر، على التوالي.

**الاستنتاجات:** أنشأت هذه الدراسة أول استبانة لبرنامج تنمية أعضاء هيئة التدريس في كلية الطب مصممة خصيصا لمعلمي الطب. وستكون أداة فاعلة لقياس احتياجات برنامج تطوير أعضاء هيئة التدريس في التعليم الطبي.

**الكلمات المفتاحية:** معلمي الطب؛ برنامج تطوير أعضاء هيئة التدريس؛ تقنية دلفي

### Abstract

**Objective:** The study aimed to develop a preliminary medical teachers' faculty development programme (FDP) needs questionnaire through two rounds of Delphi technique.

**Methods:** This study utilised the Delphi study between April to June 2019. Face-to-face interviews and a literature review were conducted to propose a set of domains and items for the FDP needs of medical teachers. Two rounds of the Delphi technique were incorporated to obtain a consensus for the proposed questionnaire by 10 expert panels from their respective fields. The consensus was pre-defined as a mean score of four or above and with a percent agreement of 75%.

**Results:** Initially, four domains and 26 items were proposed. Finally, a total of six domains and 38 items were endorsed by the expert panels. The selected domains included six competencies, including teaching, assessment, research, curriculum, publication, and public service. These domains consisted of seven, nine, six, seven, four, and five items, respectively.

**Conclusion:** This study developed the first preliminary FDPs needs questionnaire specifically designed for medical teachers. It would be an effective instrument to measure the needs of the FDPs in medical education.

**Keywords:** Delphi technique; Faculty development programme; Medical teacher

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## Introduction

Stimulating a high competence in academicians is a prominent agenda for higher education institutions, including Schools of Medical Sciences.<sup>1–3</sup> Therefore, numerous approaches have been considered to enhance professionalism, including faculty development programmes (FDP).<sup>4,5</sup> Scholars have suggested FDP as a systematic activity that aims to boost personal and professional academicians' competencies<sup>6–8</sup> through seminars, workshops, academic disclosure, and group presentations.<sup>9</sup>

However, organising an effective FDP is a challenge for the faculty, and in-depth understanding of the participants' desires of the FDP domains is crucial to ensure the effectiveness of the proposed activities. Established in the 1950s,<sup>10</sup> the Delphi technique is considered a non-face-to-face interaction of expert panels throughout a specified duration of time to obtain a consensus regarding a specific topic.<sup>11</sup>

Various studies have been conducted on FDPs in medical education; its domains and impacts on the personal and professional development of medical teachers have received extensive attention from researchers. Generally, the following four domains are discussed in literature reviews: (i) functional competencies in teaching and learning; (ii) the need for foundational competency domains; (iii) paradigm shifts in how the academic faculty should approach healthcare; and (iv) the need for the faculty to be aware of challenges in the current practice of the health profession.<sup>12,13</sup> A study has found that an effective FDP increases the participants' motivation<sup>14</sup> through enhancement of knowledge and skills related to the principles of relationship-centred care<sup>15</sup> and well-understood instructional practices in an interactive teaching environment.<sup>16</sup> The Delphi technique is widely used in many sub-disciplines; as well as in assessments,<sup>17,18</sup> curriculum development,<sup>19,20</sup> and questionnaire development.<sup>18,21–25</sup>

Over the past few years, FDPs have been recognised as an effective mechanism to promote educator's professionalism across various domains. However, the procedures to ensure its effectiveness are scarcely discussed; the observations are made before their initiation, causing the effectiveness of the application in measuring the real needs of FDPs to be questioned. Currently, a few questionnaires have been administered in FDPs to measure its implications as opposed to its needs from the participants. If provided, the instruments have only served to measure the needs of FDPs for a general teacher, and not for a medical teacher. This has led to a non-standardised use of tools in medical schools. Therefore, this study aims to close the existing gap, whereby the additional application of the Delphi technique in completing the work will help to produce a quality product.

## Research aim

The study aims to propose a preliminary questionnaire regarding the FDPs needs for medical teachers via the implementation of the Delphi study. The results may be helpful to schools of medical sciences in assessing the

real needs of such programmes among the medical teachers.

## Materials and Methods

### Study design

A Delphi study was conducted to propose an instrument regarding FDPs needs for medical teachers. Its use was justified based on the following advantages it offered: (i) engagement of accurate expert panels within the field, rendering the potential result of higher precision; and (ii) reduction of issues of bias due to its implementation of non-face-to-face interaction among the members.<sup>26</sup> The study was conducted in three phases.

### Phase 1

#### Generation of initial domain and items

The objective of the first phase was to assemble data related to the professional domain of FDPs for medical teachers. The data were obtained through: (i) face-to-face interviews with medical teachers hailing from five Malaysian public medical schools; (ii) intensive review of previous studies on the research area; and (iii) exploring the models and theoretical frameworks of the FDPs.

A total of 10 medical teachers were recruited as key informants for this study and a purposive sampling technique was used to identify eligible participants. The inclusive criteria of the study were: (i) at least one experience in an FDP; and (ii) career experience of at least five years in the school of medical sciences. Therefore, junior medical teachers were excluded from the study. These criteria were crucial to ensure that robust data were obtained regarding the topic.

#### Data collection procedure

Data were collected from medical teachers during the period spanning between April to June 2019 at their respective universities. They were invited to join the study on a voluntary basis and thus could withdraw from the interview sessions should they feel uncomfortable, without any penalty or repercussion. Informed consent was obtained from the participants as each interview was recorded to avoid missing data; the session only started after obtaining their permission. The data collection process was initiated after approval from the committee was obtained.

#### Data analysis

The data obtained were analysed using the thematic analysis method. First, the interview scripts were transcribed *ad verbatim*; following this, each transcript was repeatedly revisited to identify themes and categories related to the research objectives. This process was continued until ideas were categorised under relevant themes or categories. Consequently, a questionnaire draft was generated, which consisted of four domains and 26 items. It was then sent to the expert panels to obtain their consensus through two rounds of Delphi study. The domains included: teaching competence (7 items), assessment competence (9 items), research competence (6 items), and curriculum competence (4 items).

## Phase II

### Initial survey

Before the proposed questionnaire was sent to the expert panels for the subsequent Delphi technique, it was examined by six medical educationists to explore the instrument readability and feasibility. After considering the responses elicited, the first set of questionnaires were developed for the Delphi technique.

### Subject selection of expert panels

The expert panels for the Delphi technique must satisfy the following criteria: (i) they must be knowledgeable and experienced with the areas being studied; (ii) able to participate; (iii) able to communicate effectively; and (iv) available during study duration.<sup>27</sup> As utilising only a few panels was considered sufficient for the Delphi technique,<sup>28,29</sup> a total of 10 expert panels were selected to perform the process. They consisted of nine Malaysian medical educationists and one from the Clinical Sciences Department, College of Medicine University of Sharjah, Sharjah, United Arab Emirates (UAE).

## Phase III

### Part 1: Seeking a consensus via the Delphi study

*Delphi round 1.* In the first round, the expert panels were emailed an invitation letter, the drafted questionnaire, and an informed consent letter. The questionnaire consisted of four domains and 26 items as proposed in phase one. They were asked to review and rate the domains and items using a 5-point Likert scale from I (extremely not important) to 5 (strongly very important), as well as add, alter, or remove

any domains, items, or additional competencies as deemed appropriate. The mean and percent agreement (scoring very important or important) were calculated to determine the level of consensus for each item. Subsequently, the results were used to revise the questionnaire and establish its adequacy for round two of the Delphi technique.

*Delphi round 2.* In the second round, the expert panels were asked to review the responses obtained again and rate them using the same scale. It aimed to attain a consensus among them, and analyse the obtained data to determine the consensus level.

### Data analysis

The importance of the items was measured by using the mean score. Meanwhile, the percent agreement for each item was characterised according to the proportion of expert panels rating the item as extremely important and important. A mean score of 4.0 or above and a percent agreement of 75% or higher were designated as the point of consensus.<sup>30,31</sup>

## Results

### Profile of Delphi expert panels

A total of 10 expert panels participated in the two rounds of Delphi study. A majority of the participants were female (70%), while the remaining 30% were male. In terms of job experience, most of them possessed more than five years of service experience, while the rest logged less than five years. Nine out of the ten participants (90%) were medical teachers while one (10%) was a nursing educator (Tables 1 and 2).

**Table 1: Initial proposed constructs and items for the Medical teachers' faculty development programmes.**

Construct	Item
1. Teaching competence (7 items)	Q 1. I need the knowledge to understand the principles of adult learners
	Q 2. I need the skill to manage student centred learning
	Q 3. I need the guide on how to apply instructional model in the teaching learning activities
	Q 4. I need the skill to conduct (Problem Based Learning) PBL in the teaching process
	Q 5. I need the skill to conduct (Clinical Based Learning) CBL in the teaching process
	Q 6. I need the skill to apply (Team Based Learning) TBL in the teaching process
	Q 7. I need the skill to apply E-learning in the teaching process
2. Assessment competence (9 items)	Q 8. I need the skills to conduct formative assessment
	Q 9. I need the skills to conduct summative assessment
	Q10. I need the skill to develop Multiple Choice Question (MCQ)
	Q11. I need the skill to develop Multiple True-False Question (MTF)
	Q12. I need the skill to develop the objective structured clinical examination (OSCE) /objective structured practical examination (OSPE)
	Q13. I need the skill to develop standard setting
	Q14. I need a guide for the Direct Observation Clinical Encounter Examination (DOCEE)
	Q15. I need a guide for structured oral exams (SOE)
Q16. I need a guide for workplace-based assessment	
3. Research competence (6 Items)	Q17. I need the skill to manage qualitative study approach
	Q18. I need the skill to manage quantitative study approach
	Q19. I need the skills to manage quantitative data using software (e.g., SPSS)
	Q20. I need the skills to manage qualitative data using software (e.g., ATLAST-i)
	Q21. I need the skills to manage my manuscripts
	Q22. I need the skills to manage my academic writing
4. Curriculum competence (4 items)	Q23. I need a guide to manage curriculum development
	Q24. I need a guide to manage documents on medical curriculum
	Q25. I need a guide to conduct curriculum revision
	Q26. I need a guide to manage accreditation matters

**Table 2: Profile of the Delphi expert panels.**

Item	Round 1 (n = 10)	Round 2 (n = 10)
Gender, n (%)		
Male	3 (30%)	3 (30%)
Female	7 (70%)	7 (70%)
Work experience (years) n (%)		
< 5	4 (40%)	4 (40%)
>5	6 (60%)	6 (60%)
Background, n (%)		
Medical	9 (90%)	9 (90%)
Nursing	1 (10%)	1 (10%)

*Delphi round 1*

After the questionnaire was rated by the expert panels, four domains and 26 items were subsequently retained. The range, mean and portion of agreement value for the items were 4.0–4.91 and 77%–100%, respectively. Furthermore, two domains and 12 new items were proposed in this round (Table 3).

*Delphi round 2*

After the questionnaire was rated by the expert panels, the four initial domains and 26 items were retained, while an additional two domains and 12 new items were proposed. The additional domains were publication competence and community service competence, which were represented by four and five items, respectively. The items of publication

**Table 3: Faculty development programme items score in the Delphi study round 1.**

Construct	Items	Delphi study	
		Mean	Agreement (%)
1. Teaching competence (7 items)	Q1	4.54	91
	Q2	4.83	98
	Q3	5.0	94
	Q4	4.83	97
	Q5	4.54	90
	Q6	4.54	91
	Q7	4.54	90
2. Assessment competence (9 Items)	Q8	5.0	90
	Q9	5.0	90
	Q10	4.28	96
	Q11	4.27	96
	Q12	4.54	97
	Q13	4.91	77
	Q14	5.0	81
	Q15	5.0	82
	Q16	4.83	79
3. Research competence (6 Items)	Q17	4.54	90
	Q18	5.0	100
	Q19	5.0	100
	Q20	4.54	92
	Q21	4.84	100
	Q22	4.0	93
4. Curriculum competence (7 items)	Q23	4.0	89
	Q24	4.0	90
	Q25	4.0	90
	Q26	4.0	77

competence consisted of: 30 (I need a guide for managing plagiarism issues); 31 (I need a guide for getting the research published); 32 (I need a guide for establishing more collaborative research partnerships nationally); and 33(I need a guide for establishing more collaborative research partnership internationally). Items 34 (I need a guide for managing a community clinic), 35 (I need a guide for managing a public awareness campaign), 36 (I need a guide to conduct disaster management), 37 (I need a guide to engage in academic activities) and 38 (I need a guide to organise a non-government organisation (NGO) for community service competence. Meanwhile, three new items were added for research competency, which were items 27 (I need a guide for revising intended learning outcomes); 28 (I need a guide for mapping ILOs with unit/programme outcomes); and 29 (I need a guide for providing effective feedback towards student and faculty concerns). Lastly, a total of six domains and 38 items were established after round two of the Delphi study, whereby the range mean and portion of agreement value for

**Table 4: Faculty development programme items score in the Delphi study round 2.**

Construct	Items	Delphi study	
		Mean	Agreement (%)
1. Teaching competence (7 items)	Q1	4.86	92
	Q2	5.0	98
	Q3	5.0	93
	Q4	4.86	98
	Q5	4.90	90
	Q6	4.90	91
	Q7	4.90	90
2. Assessment competence (9 Items)	Q8	5.0	90
	Q9	5.0	90
	Q10	5.0	98
	Q11	4.17	97
	Q12	5.0	96
	Q13	4.19	80
	Q14	4.86	80
	Q15	4.92	80
	Q16	4.18	80
3. Research competence (6 Items)	Q17	5.0	91
	Q18	5.0	100
	Q19	5.0	100
	Q20	5.0	92
	Q21	4.81	100
	Q22	4.0	90
4. Curriculum competence (7 items)	Q23	4.72	88
	Q24	4.72	89
	Q25	4.18	89
	Q26	4.16	80
	Q27	4.0	90
	Q28	4.5	91
	Q29	4.0	80
5. Publication competence (4 Items)	Q30	5.0	100
	Q31	4.91	100
	Q32	4.83	100
	Q33	4.82	100
6. Community service competence (5 items)	Q34	4.0	77
	Q35	4.82	78
	Q36	4.0	76
	Q37	4.0	79
	Q38	4.0	77

**Table 5: The final domain and items of the medical teacher's faculty development programmes.**

Construct	Item
1. Teaching competence (7 items)	Q1. I need the knowledge to understand the principles of adult learners
	Q2. I need the skill to manage student centred learning
	Q3. I need the guide on how to apply instructional model in the teaching learning activities
	Q4. I need the skill to conduct (Problem Based Learning) PBL in the teaching process
	Q5. I need the skill to conduct (Clinical Based Learning) CBL in the teaching process
	Q6. I need the skill to apply (Team Based Learning) TBL in the teaching process
	Q7. I need the skill to apply E-learning in the teaching process
2. Assessment competence (9 Items)	Q8. I need the skills to conduct formative assessment
	Q9. I need the skills to conduct summative assessment
	Q10. I need the skill to develop Multi Choice Question (MCQ)
	Q11. I need the skill to develop Multi True False Question (MTF)
	Q12. I need the skill to develop the objective structured clinical examination (OSCE) / objective structured practical examination (OSPE)
	Q13. I need the skill to develop standard setting
	Q14. I need a guide for the Direct Observation Clinical Encounter Examination (DOCEE)
	Q15. I need a guide for structured oral exams (SOE)
	Q16. I need a guide for workplace-based assessment
3. Research competence (6 Items)	Q17. I need the skill to manage qualitative study approach
	Q18. I need the skill to manage quantitative study approach
	Q19. I need the skills to manage quantitative data using software (e.g., SPSS)
	Q20. I need the skills to manage qualitative data using software (e.g., ATLAST-I, N-Vivo etc.)
	Q21. I need the skills to manage a quality proposal writing
	Q22. I need a guide to manage selecting research topic
4. Curriculum competence (7 Items)	Q23. I need a guide to manage curriculum development
	Q24. I need a guide to manage documents on medical curriculum
	Q25. I need a guide to conduct curriculum revision
	Q26. I need a guide to manage accreditation matters
	Q27. I need a guide to revise intended learning outcomes
	Q28. I need a guide to map ILOs with unit/program outcomes
	Q29. I need a guide to provide effective feedback to students and faculty concerns
5. Publication competence (4 items)	Q30. I need a guide to manage plagiarism issues
	Q31. I need a guide for getting the research published
	Q32. I need a guide for establishing more collaborative research partnerships nationally
	Q33. I need a guide for establishing more collaborative research partnerships internationally
6. Community service competence (5 items)	Q34. I need a guide to manage a community clinic
	Q35. I need a guide to manage a public awareness campaign
	Q36. I need a guide to conduct disaster management
	Q37. I need a guide to engage in academic activities
	Q38. I need a guide to organise a non-government organisation (NGO)

the items ranged from 4.0 to 5.0 and 77%–100%, respectively (Tables 4 and 5).

## Discussion

This study positioned a precise preliminary instrument for medical teachers to assess the needs of FDPs globally. A total of six domains and 38 items representing the professional construct of FDPs among medical teachers were successfully developed following their endorsement by the expert panels in the two rounds of Delphi technique. Interestingly, the presence of the constructs and items was elicited by the medical teachers themselves.

Teaching competence is a core competency for those who are interested in the teaching profession.<sup>32,33</sup> It includes acquiring andragogy<sup>34,35</sup> principles and integrating information technology (IT) components in learning

activities.<sup>36,3</sup> This is consistent with the results of the present study in which these components become the primary items of FDPs needs. The evidence has formed a crucial part of FDP needs.<sup>32,34</sup>

Teachers who are excellent in students' assessment will be more flexible in their classroom management. Therefore, highlighting the assessment competence as a need in FDPs confirms the importance of such items in medical education.<sup>38</sup> A similar issue transpired in the research competence; being an excellent researcher in implementing qualitative and quantitative approaches both, if possible, is an aim academicians, including medical teachers aspire for. Therefore, the presence of related study skills' items in the FDPs needs questionnaire is consistent with the nature of the academic profession itself.

A professional academician is not only competent in teaching matters but also beyond this, curriculum

management. Understanding how medical curriculum operates and the strengths and weaknesses of its content are additional perks for the educators. Moreover, they must also be capable of tackling the challenges of curriculum strategic planning, delivery, assessment, and evaluation.<sup>39</sup> Hence, the emergence of the curriculum management needs supports the above statement.

Besides, the present study supports another study that has previously identified the close relationship between publication competence and the educator's professionalism. It includes managing a publishable manuscript,<sup>40,41</sup> understanding plagiarism issues,<sup>42</sup> and establishing research networking nationally and globally.<sup>43</sup>

Additionally, engagement in social activities such as NGO-related and public awareness programmes is crucial for ensuring highly professional medical teachers.<sup>44</sup> Exceptional knowledge and skills in the related fields can be obtained through effective FDPs. Hence, the emergence of this item will help the faculty members to develop their skills in community engagement.<sup>45</sup>

This study has several limitations. First, it focused only on the professional domain, and not others. This has led to the incompleteness of the assessment FDPs needs among the medical teachers. Second, all data obtained were limited to public medical schools, which might affect the information accuracy. In view of these issues, it is suggested that future studies consider other features of the FDPs such as personal characteristics to ensure the questionnaire is more comprehensive. Furthermore, they should include participants from private medical schools, so that similarities and differences in the findings can be compared.

## Conclusion

The present study offered a credible instrument for measuring the real needs of FDPs for medical teachers, in a situation where these educators were faced with the lack of such a tool. Thus, the present study could help in closing the knowledge gap. This instrument is not only important for the organisers of the FDPs but also faculty members and individuals responsible for the staff development unit.

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## Conflict of interest

The author has no conflict of interest to declare.

## Ethical approval

The present study was conducted after approval by the USM ethic committee (USM/JEPeM/18120790).

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