

## ARTICLE INFO

Submitted: 09-09-2018

Accepted: 06-02-2019

Online: 29-03-2019

## Training Needs Assessment of Academic Teaching Staff in Faculty of Dentistry, University of Gezira, Sudan 2018

Abubakr K Yousif<sup>1</sup>, Ozaz Y Ahmed<sup>2</sup>, Wail N Osman<sup>3</sup><sup>1</sup>National Health Insurance Fund, Gezira, SUDAN<sup>2</sup>Faculty of Medical Laboratory Sciences, University of Gezira, SUDAN<sup>3</sup>Faculty of Medicine, University of Gezira, SUDAN

**To cite this article:** Yousif AK, Ahmed OY, Osman WN. Training needs assessment of academic teaching staff in Faculty of Dentistry, University of Gezira, Sudan 2018. *Education in Medicine Journal*. 2019;11(1):31–41. <https://doi.org/10.21315/eimj2019.11.1.4>

**To link to this article:** <https://doi.org/10.21315/eimj2019.11.1.4>

### ABSTRACT

Training Needs Assessment (TNA) is a triangular term; training (any activities to gain knowledge, skills or change attitude), needs (the gap between current and desired or required) and assessment (process for identifying needs and placing them in priority order). Investment in training of Academic Teaching Staff (ATS) can achieve better performance. TNA is the right step to design an appropriate, cost-effective training programme with clear priorities setting to achieve specific knowledge, skills and practice. This study aimed to assess the training needs of ATS in Faculty of Dentistry, University of Gezira, Sudan by selecting competencies and suggested priorities. This study designed as a population survey to determine training needs of ATS using self-administered, validated and adapted questionnaire (self-assessment) compared to the job description. The questionnaire was distributed to all available 35 staffs. The response rate was 82.9% (29 respondents). Results showed an urgent need for all competencies except only three, they were considered as well. These were teaching, computer, and communication skills. The priority of TNA to improve ATS could be from highest to the lowest as follows: research, leadership, health professional education, managerial, community development, and finally teaching and learning skills.

**Keywords:** *Self-assessment, Training needs, Teaching staff, Dentistry*

### CORRESPONDING AUTHOR

Abubakr K Yousif, M.PHARM, MHPE, Consultant of Pharmaceutical Microbiology. Pharmaceutical Department, Health Services Directorate, National Health Insurance Fund, Gezira State Branch, Block 242, Wadmadani City, Sudan | Email: abubarkhidir@hotmail.com

### INTRODUCTION

The training and educational development programmes for university teaching staff is crucial for quality improvement for the staff, university as well as the community development (1–2).

Training Needs Assessment (TNA) of Academic Teaching Staff (ATS) can be determined by different methods, but mainly self, peer or student assessment. Performance appraisal by observation checklist or regular reports also can be used. Job description is a unique marker to critically appraised TNA as well as career development. TNA using self-assessment

found to be a good example of TNA model when comparing to organisational culture (3).

TNA literature had been increasing dramatically in the past few decades. Systematic review of the literature was done by Ferreira and Abbad (4). They summarised all relevant studies from 1978 to 2010. The majority of the studies was appeared from 1990 and then growing especially in England and United States (4). Another systematic review by Iqbal and Khan found growing concept on TNA, and it had been shifted from conducting a training activity to every proactive programme used for developing and implementing varied practical solutions for individuals, work groups, and organisations (5). Many studies conducted in professional jobs like nurse, physician and medical laboratory technician, and research in academic teaching staff was sparse.

Lack of research in TNA conducted to university staff and academicians highlighted the novelty of this study. The objectives were to assess the training needs of dentistry faculty teaching staff by selecting competencies and suggested priorities.

## METHODS

Descriptive, population survey used self-administered, adapted and validated Hennessy-Hicks Questionnaire.

### The Questionnaire

Professor Carolyn Hicks and Dr. Deborah Hennessy in The University of Birmingham, UK have developed this tool by using the available literature, together with data obtained from focus groups and semi-structured interviews. They were analysed and synthesised into themes to provide construct validity. From each theme, a range of items was developed into questionnaire

format validity. The pilot questionnaire was administered to health care professionals from all disciplines; their responses were analysed using a variety of multivariate techniques. This stage allowed refinement of the instrument into its most reliable and valid items. The final questionnaire had been used since 1996 with over 7,000 health care professionals globally, providing a robust database, made assurance for validity and reliability of this tools (6).

Although Hennessy-Hicks Questionnaire is depended on self-assessment, it was validated, adapted by World Health Organization (WHO) and used before in different health professions, like nurses, midwives and primary healthcare team (7–11). Self-assessment for professional medical laboratory technician (12) and the emergency medical technician was also studied (13). The tool was used in both developed (14) and developing countries (1). It is main aims to identify training needs of the individual, group or organisational level, and to prioritise these training needs (6).

The adapted Hennessy-Hicks Questionnaire used in this study was based on the competencies of research, leadership, teaching and learning, health professional education, communication, management skills, and community development. The questionnaire consists of two sections: A and B. Section A represented the importance of competencies, and was consist of five points (1 = not important, 2 = to some extent, 3 = relatively important, 4 = important, 5 = very important). Section B represented the performance of competencies (1= weak, 2 = medium, 3 = good, 4 = very good, 5 = excellent). Comparing the scores for importance/performance provides an assessment of where the greatest training needs lie. The greater the difference in scores, the greater the training needs. The data was entered and analysed using SPSS Version 16 (see Appendix).

## Quadrant Line Interpretation

Quadrant line was used in this present study to explain the current situation of the training needs in four areas: Q-1 up to Q-4 (Q-1: important task, not well performed so training required urgently; Q-2: important task, well performed, so no training required; Q-3: unimportant task, not well performed, so the training required but as a lower priority; Q-4: unimportant task well performed, so no training required).

## Study Design

The study was designed as descriptive, cross-sectional study first, and then modified to be a population survey (because of the small number of whole targeted population).

## Sampling Techniques

The sample was calculated using EPI INFO random (not cluster) sampling, at the level of confidence 95%. The calculated sample size was 32 out of 35 total available teaching staff. As there was little difference between sample size calculated and total population, the sample size considered as total coverage. All available teaching staff was included, except those they refused to participate or absent. The data were collected through self-administered, structured, validated questionnaire addressed to ATS from March to May 2018.

## Study Setting

This study was conducted in the Faculty of Dentistry, University of Gezira, central Sudan. It was established in 2001 as the first dental college established outside the capital Khartoum. The faculty adopts the philosophy of University of Gezira in serving and solving the problems of the community and promoting preventive and curative oral health services. The first batch (installment 24) graduated in 2007. The Faculty of Dentistry aims to produce academic excellence dentist who is morally virtuous

and able to develop his abilities through self-education and committed to teamwork. The faculty offers a bachelor of oral and dental medicine and surgery in 10 semesters as well as a master's and a doctorate degree in public oral and dental health.

## RESULTS

The total available ATS of dentistry faculty at the time of this study (May–June 2018), were 35. The response rate was 82.9% (29 respondents). The unresponsive rate was due to that four of the staff spent their annual vacation outside the country and two females were in married and birth leave. The respondents' mean age was 35 years (range 25–58) and their mean experience in the post was five years (range 1–18). The others demographic characteristics (gender, job title, department) were shown in Table 1.

The TNA was explored as means of importance and performance for all ATS rather than individuals. Then the difference between the importance (A) and performance (B) interpreted as the actual training needs (TN).

The research (seven competencies) and the leadership (eight competencies) results showed means of importance above four (very important job) and means of performance below three (low performance of the important job), with quadrant line laid in Q-1 (see Table 2).

Teaching and Learning (five competencies) results showed means of importance above four and means of performance below three (Q-1 Quadrant line), except for teaching skills which showed means above three (Q-2 Quadrant line). While Health Professional Education (five competencies) in means of importance above four and means of performance below three for four competencies (Q-1 Quadrant line), and the only one above three was skills of using soft programmes and computer skills (Q-2 Quadrant line).

**Table 1:** Demographic characteristics of ATS in the Faculty of Dentistry, University of Gezira

| Demographic                    | Total respondents n = 29<br>n (%) | Missing<br>n (%) |
|--------------------------------|-----------------------------------|------------------|
| Gender                         |                                   | 0 (0.0)          |
| Male                           | 8 (27.6)                          |                  |
| Female                         | 21 (72.4)                         |                  |
| Job Title                      |                                   | 0 (0.0)          |
| Professor                      | 1 (3.4)                           |                  |
| Associate Professor            | 2 (6.9)                           |                  |
| Assistant Professor            | 7 (24.1)                          |                  |
| Lecturer                       | 4 (13.8)                          |                  |
| Teaching Assistant             | 15 (51.7)                         |                  |
| Specialty                      |                                   | 3 (10.3)         |
| Dental public health           | 3 (10.3)                          |                  |
| Basic sciences                 | 4 (13.8)                          |                  |
| Oral and maxillofacial surgery | 2 (6.9)                           |                  |
| Endodontic                     | 1 (3.4)                           |                  |
| Conservative                   | 3 (10.3)                          |                  |
| Pediatric dentistry            | 2 (6.9)                           |                  |
| Periodontology                 | 3 (10.3)                          |                  |
| Dental prosthesis              | 4 (13.8)                          |                  |
| Orthodontic                    | 1 (3.4)                           |                  |
| Restorative dentistry          | 2 (6.9)                           |                  |
| Medicine                       | 1 (3.4)                           |                  |
| Age (25–58) mean 34.89         | 27 (93.1)                         | 2 (6.9)          |
| Years in post (1–18) mean 4.82 | 28 (96.6)                         | 1 (3.4)          |

The Managerial, and Community Development competencies in means of importance above four and means of performance under three (Q-1 Quadrant line), while Communication competency seen in Q-2 by means of performance above three (Q-2 Quadrant line) (see Table 2).

Figure 1 summarised training needs of academic teaching staff. The main quadrant line of ATS in Q-1 (urgent training needs) and Q-2 (No need for training). When comparing the means of competencies of importance and performance to all ATS, a clear difference in both was appeared and this indicated the training needs (see Figure 2).

## DISCUSSION

The cornerstone of judgement made in this study related to TNA was based on importance of the task to the job and performance appraisal of the same task. The importance was scaled into not important, to some extent, relatively important, important, and very important, while, performance scale was weak, medium, good, very good and excellent.

Referred to the job description of ATS in the University of Gezira; the research competencies are required from all higher staff (professor, associate professor and assistant professor) (15). In contrast, no

**Table 2:** Importance and performance mean results of ATS

| Competency                    | N = 29                              | Importance mean* | Performance mean | TN** | QA† |
|-------------------------------|-------------------------------------|------------------|------------------|------|-----|
| Research                      | Conducting scientific research      | 4.72             | 1.79             | 2.93 | Q-1 |
|                               | Accessing research resources        | 4.41             | 1.75             | 2.66 | Q-1 |
|                               | Scientific writing & editing        | 4.38             | 1.76             | 2.62 | Q-1 |
|                               | Authoring & translating books       | 4.07             | 1.83             | 2.24 | Q-1 |
|                               | Making scientific poster            | 4.03             | 2.00             | 2.03 | Q-1 |
|                               | Writing proposal for grant project  | 4.34             | 2.07             | 2.27 | Q-1 |
|                               | Managing research project           | 4.17             | 2.21             | 1.96 | Q-1 |
| Leadership                    | Participating in problem solving    | 4.32             | 2.62             | 1.70 | Q-1 |
|                               | Building external relationship      | 4.45             | 2.28             | 2.17 | Q-1 |
|                               | Generate & innovate new ideas       | 4.38             | 2.55             | 1.83 | Q-1 |
|                               | Time management                     | 4.57             | 2.71             | 1.86 | Q-1 |
|                               | Making do with limited resources    | 4.07             | 2.93             | 1.14 | Q-1 |
|                               | Appraising your own performance     | 4.41             | 2.85             | 1.56 | Q-1 |
|                               | Providing feedback                  | 4.46             | 2.76             | 1.70 | Q-1 |
| Multidisciplinary team skills | 4.41                                | 2.90             | 1.51             | Q-1  |     |
| Teaching and learning         | Teaching & learning skills          | 4.76             | 3.07             | 1.69 | Q-2 |
|                               | Academic advisory to students       | 4.59             | 2.93             | 1.66 | Q-1 |
|                               | Academic supervision to students    | 4.72             | 2.89             | 1.83 | Q-1 |
|                               | Constructing, report results        | 4.62             | 2.86             | 1.76 | Q-1 |
|                               | Skills of effective presentation    | 4.61             | 2.85             | 1.76 | Q-1 |
| Health professional education | Developing curriculum               | 4.69             | 2.71             | 1.98 | Q-1 |
|                               | Using technology & computer         | 4.76             | 3.00             | 1.76 | Q-2 |
|                               | Participate in qualification of ATS | 4.41             | 2.12             | 2.29 | Q-1 |
|                               | Students assessment methods         | 4.41             | 2.72             | 1.69 | Q-1 |
|                               | Quality & accreditation             | 4.46             | 1.76             | 2.70 | Q-1 |
| Managerial                    | Legislations & laws                 | 4.41             | 2.29             | 2.12 | Q-1 |
|                               | Participate in academic job         | 4.43             | 2.69             | 1.74 | Q-1 |
|                               | Participate in managerial job       | 4.21             | 2.66             | 1.55 | Q-1 |
| Communication                 | Communication skills                | 4.41             | 3.28             | 0.71 | Q-2 |
| Community                     | Community development               | 4.45             | 2.81             | 1.99 | Q-1 |

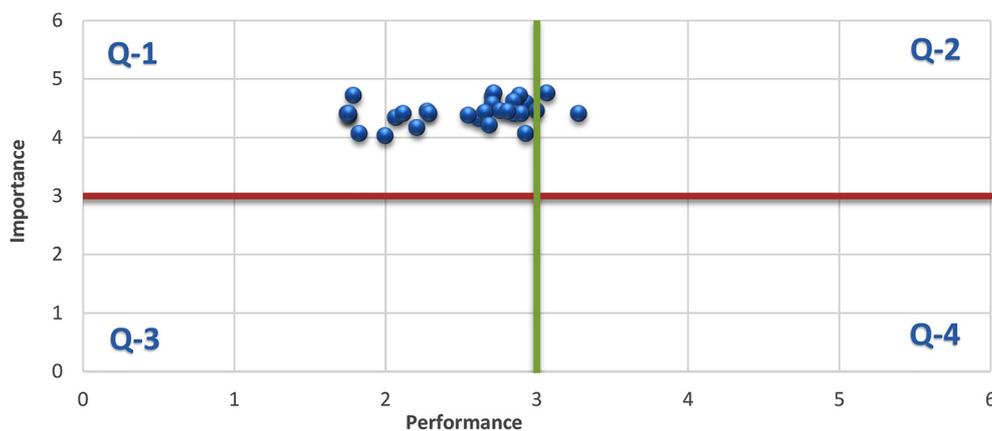
\*Mean interpretation (4–5 = very important, 3–3.9 = important, 2–2.9 relatively important, 1–1.9 not important)

\*\*TN: Training Need (Difference between means of importance and performance, greater difference indicate training needs)

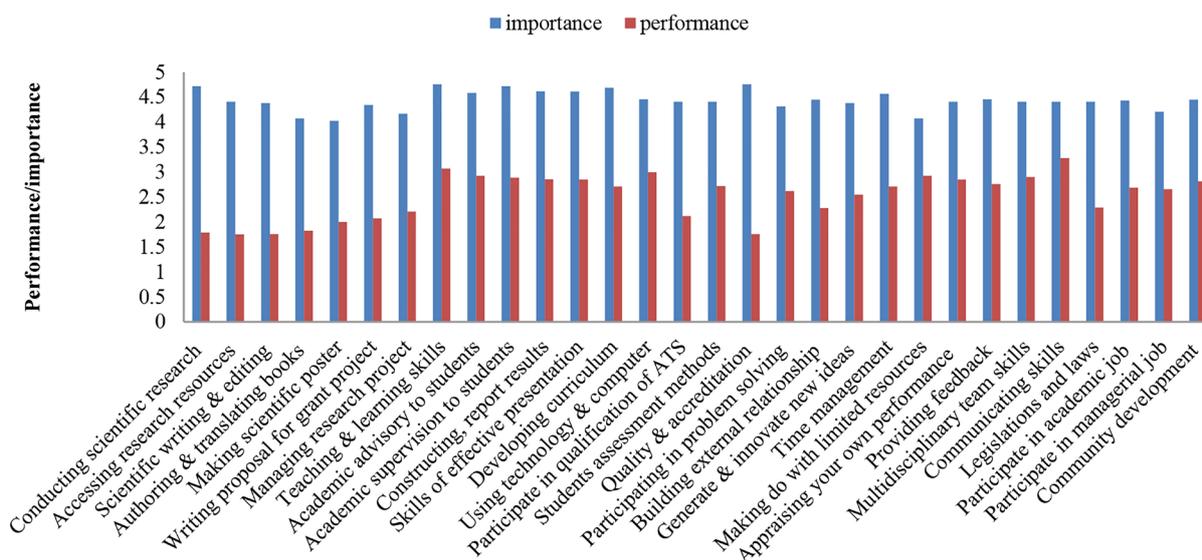
† Quadrant Area: (Q1: Training required urgently, Q2 & Q4: No training required, Q3: Training required but not urgent)

mandatory training for research, except optional, according to the current training programme running in the university education and development centre (UEDC) (16). On the other hand, authoring and translating books, writing proposals for grant project and managing research project is not required from lecturer and teaching assistant, but still rating high

importance as declared by them. Budget constraints and accessibility to research fund is more common in Africa (17) as well as Sudan (18). The training needs in research competencies are so crucial for all staff members, so UEDC should focus on improving these competencies and provide new policies for implementing the university training.



**Figure 1:** Quadrant line for all competencies which showed the main four quadrants (Q-1: Training required urgently, Q-2 & Q-4: No training required, Q-3: Training required but not urgent). The quadrant line demonstrates Q-1 for all competencies except communication, teaching and computer skills appeared in Q-2.



**Figure 2:** Comparison of competencies: importance (1 = not important, 2 = to some extent, 3 = relatively important, 4 = important, 5 = very important) and performance (1 = weak, 2 = medium, 3 = good, 4 = very good, 5 = excellent).

The leadership competencies results showed lower performance in the majority, like building external relationship, generate new ideas and problem-solving. The competencies of leadership that need investment in training were culture of providing feedback to students and colleagues, time management and problem-solving for all staffs, because they are stated in job description (15). While building external relationship exclusive to higher academic teaching staff (HATS).

Teaching and Learning competencies showed good performance for teaching skills. This reflected the outcomes of mandatory training in this field conducted by UEDC for all newly enrolled staff and as well as for career promotion of lecturer and teaching staff (16). The others skills that need further promotion, were academic advisory, academic supervision to the students, constructing and analysing student results and effective presentation skills.

The Health Professional Education competencies that showed good performance was computer skills, which can be considered as a remarkable improvement towards globalisation and international license of computer skills. The rest of competencies, although they required from higher staff, but need training, especially in quality management and accreditation of the academic programme and participating in the qualification of other staff. UEDC should provide training covering these areas, especially the training of trainers of HATS to maintain the sustainability and minimise the cost of training.

The results showed good performance in communication skills with students, colleagues and community. This may be due to the raising of awareness regarding these competencies, beside the continuous and regular training for university staff done by UEDC (16). The Managerial competencies showed lower performance in knowledge related to legislation and laws and engaging in community development, although the philosophy of University of Gezira is community oriented. These results of low performance need more specification for community engagement to the teaching staff and careful definition of the activities that considered as community development.

## LIMITATION

The present study was done using only one tool (self-assessment). The authors recommended that a more comprehensive tool like peer assessment and student assessment to be integrated together in future studies to ensure good quality in TNA tools.

## CONCLUSION

Training needs of self-assessment of ATS at Faculty of Dentistry, University of Gezira, Sudan by using modified, adapted, validated Hennessy-Hicks Questionnaire showed an urgent need for all competencies

except only three needed to be sustained and empowered because they are now considered as well. These were teaching, computer and communication skills.

The priority of training investment and great efforts to improve ATS in the Faculty of Dentistry, University of Gezira could be from highest to the lowest as follows: research, leadership, health professional education managerial, community and finally teaching and learning skills.

## ACKNOWLEDGEMENTS

The authors thanks Dr. Mugahid Abderhman, dean of the Faculty of Dentistry and Dr. Muhaned and Dr. Ahmed Kamal, who coordinated the questionnaire distribution and collection. Grateful thanks to all who participated and gave their valuable time in responding. Our thanks extend to Dr. Abdalla Alfaki, Director of the University Educational Development Centre for his kind cooperation and valuable information. This study was not funded by grants from any organisation. It is an original work of the corresponding author as the complementary dissertation for master degree in Health Professional Education.

## APPENDIX

### SECTION 1: Demographic Characteristic of Teaching Staff:

**1. Gender:**

Male                      Female

**2. Job title:**

Professor  
 Associate professor  
 Assistant professor  
 Lecturer  
 Teaching assistant

**3. Department:**

**4. Age:**

**5. Number of years in current position:**

### SECTION 2: Training Needs

In order to perform your job effectively you need relevant skills. You will see listed below a range of skilled activities many of which you undertake in performing your job. Look at each of these activities and then rate each one by marking the appropriate number with an “X”. The first rating (A) is concerned with how important the activity is to the successful performance or your job; the second rating (B) is concerned with how well you currently perform that activity.

| Competency  | A: How important is this activity to the successful Performance of your job?<br>Rating of 1–5<br>(not important = 1; very = 5) |   |   |   |   | B: How well do you consider that you currently perform this activity?<br>Rating of 1–5<br>(weak = 1; excellent = 5) |   |   |   |   |
|---|--|---|---|---|---|---|---|---|---|---|
|   | 1  | 2 | 3 | 4 | 5 | 1   | 2 | 3 | 4 | 5 |
|   | 1. Conducting scientific research in your specialty area   |   |   |   |   |   |   |   |   |   |
| 2. Accessing research resources (e.g. time, money and equipment)  |  |   |   |   |   |   |   |   |   |   |
| 3. Writing and editing scientific papers to peer reviewed journal |  |   |   |   |   |   |   |   |   |   |
| 4. Authoring and translating books related to your specialty      |  |   |   |   |   |   |   |   |   |   |
| 5. Attending, presenting, making poster in scientific conferences |  |   |   |   |   |   |   |   |   |   |
| 6. Writing proposal for grant project                             |  |   |   |   |   |   |   |   |   |   |
| 7. Managing research project                                      |  |   |   |   |   |   |   |   |   |   |
| 8. Teaching & learning skills                                     |  |   |   |   |   |   |   |   |   |   |
| 9. Academic advisory to students                                  |  |   |   |   |   |   |   |   |   |   |
| 10. Academic supervision to students                              |  |   |   |   |   |   |   |   |   |   |

(Continued on next page)

## Appendix (Continued)

| Competency  | A: How important is this activity to the successful Performance of your job?<br>Rating of 1–5<br>(not important = 1; very = 5) |   |   |   |   | B: How well do you consider that you currently perform this activity?<br>Rating of 1–5<br>(weak = 1; excellent = 5) |   |   |   |   |
|---|--|---|---|---|---|---|---|---|---|---|
|   | 1  | 2 | 3 | 4 | 5 | 1   | 2 | 3 | 4 | 5 |
|   | 11. Constructing, marking, analysing and report student results  |   |   |   |   |   |   |   |   |   |
| 12. Skills of effective presentation and lecturing  |  |   |   |   |   |   |   |   |   |   |
| 13. Preparing and developing curriculum   |  |   |   |   |   |   |   |   |   |   |
| 14. Using technical equipment, including soft computer programme related to your job                  |  |   |   |   |   |   |   |   |   |   |
| 15. Participate in training and qualification of academic staff                                       |  |   |   |   |   |   |   |   |   |   |
| 16. Students assessment methods   |  |   |   |   |   |   |   |   |   |   |
| 17. Quality management and accreditation of academic programme  |  |   |   |   |   |   |   |   |   |   |
| 18. Knowledge related to university legislations and laws   |  |   |   |   |   |   |   |   |   |   |
| 19. Participate in community development programme  |  |   |   |   |   |   |   |   |   |   |
| 20. Participating in problem solving in university and community                                      |  |   |   |   |   |   |   |   |   |   |
| 21. Building external relationship with others related faculties national, regional and international |  |   |   |   |   |   |   |   |   |   |
| 22. Generate and innovate new ideas to develop your works   |  |   |   |   |   |   |   |   |   |   |
| 23. Organising your own time effectively  |  |   |   |   |   |   |   |   |   |   |
| 24. Making do with limited resources  |  |   |   |   |   |   |   |   |   |   |
| 25. Communicating effectively with students, colleagues and public                                    |  |   |   |   |   |   |   |   |   |   |
| 26. Appraising your own performance in your current job   |  |   |   |   |   |   |   |   |   |   |
| 27. Providing feedback to students and colleagues   |  |   |   |   |   |   |   |   |   |   |
| 28. Participate in Academic job in all level (department, faculty and university)                     |  |   |   |   |   |   |   |   |   |   |
| 29. Participate in Managerial job in all level (department, faculty and university)                   |  |   |   |   |   |   |   |   |   |   |
| 30. Working as a member of a team in your institution and multidisciplinary team                      |  |   |   |   |   |   |   |   |   |   |

## REFERENCES

1. Gaspard J, Yang CM. Training needs assessment of health care professionals in a developing country: the example of Saint Lucia. *BMC Med Educ.* 2016;16:112. <https://doi.org/10.1186/s12909-016-0638-9>
2. Gould D, Kelly D, White I, Chidgey J. Training needs analysis: a literature review and reappraisal. *Int J Nurs Stud.* 2004;41(5):471–86. <https://doi.org/10.1016/j.ijnurstu.2003.12.003>
3. Chiu W, Thompson D, Mak W-m, Lo K. Re-thinking training needs analysis: a proposed framework for literature review. *Personnel Review.* 1999;28(1/2):77–90. <https://doi.org/10.1108/00483489910249009>
4. Ferreira RR, Abbad G. Training needs assessment: where we are and where we should go. *BAR-Brazilian Administration Review.* 2013;10(1):77–99. <https://doi.org/10.1590/S1807-76922013000100006>
5. Iqbal MZ, Khan RA. The growing concept and uses of training needs assessment: a review with proposed model. *Journal of European Industrial Training.* 2011;35(5):439–66. <https://doi.org/10.1108/03090591111138017>
6. Hicks C, Hennessy D. Hennessy-Hicks training needs analysis questionnaire and manual. UK: University of Birmingham; 2011 [cited 7 March 2018]. Available from: [https://www.who.int/workforcealliance/knowledge/HennessyHicks\\_trainingneedstool.pdf](https://www.who.int/workforcealliance/knowledge/HennessyHicks_trainingneedstool.pdf)
7. Hennessy D, Hicks C, Koesno H. The training and development needs of midwives in Indonesia: paper 2 of 3. *Hum Resour Health.* 2006;4:9. <https://doi.org/10.1186/1478-4491-4-9>
8. Hennessy D, Hicks C, Hilan A, Kawonal Y. A methodology for assessing the professional development needs of nurses and midwives in Indonesia: paper 1 of 3. *Hum Resour Health.* 2006;4:8. <https://doi.org/10.1186/1478-4491-4-8>
9. Hicks C, Hennessy D, Barwell F. Development of a psychometrically valid training needs analysis instrument for use with primary health care teams. *Health Serv Manage Res.* 1996;9(4):262–72. <https://doi.org/10.1177/095148489600900406>
10. Hicks C, Fide J. The educational needs of non-specialist breast care nurses. *Nurse Education Today.* 2003;23(7):509–21. [https://doi.org/10.1016/S0260-6917\(03\)00075-3](https://doi.org/10.1016/S0260-6917(03)00075-3)
11. Hicks C, Tyler C. Assessing the skills for family planning nurse prescribing: development of a psychometrically sound training needs analysis instrument. *J Adv Nur.* 2002;37(6):518–31. <https://doi.org/10.1046/j.1365-2648.2002.02127.x>
12. Kasvosve I, Ledikwe JH, Phumaphi O, Mpofo M, Nyangah R, Motswaledi MS, Martin R, Semo B. Continuing professional development training needs of medical laboratory personnel in Botswana. *Hum Resour Health.* 2014;12:46. <https://doi.org/10.1186/1478-4491-12-46>
13. Knox S, Cullen W, Dunne C. Continuous professional competence (CPC) for emergency medical technicians in Ireland: educational needs assessment. *BMC Emerg Med.* 2013;13:25. <https://doi.org/10.1186/1471-227X-13-25>
14. Wangensteen S, Finnbakk E, Adolfsson A, Kristjansdottir G, Roodbol P, Ward H, Fagerström L. Postgraduate nurses' self-assessment of clinical competence and need for further training. A European cross-sectional survey. *Nurse Educ Today.* 2018;62:101–6. <https://doi.org/10.1016/j.nedt.2017.12.020>
15. University of Gezira. Academic teaching staff job description. <http://newscenter.uofg.edu.sd/?p=7062>
16. University Educational Development Centre. <http://uedc.uofg.edu.sd/Administration.aspx>. 2018. <https://doi.org/10.1101/347112>

17. Okoduwa SIR, Abe JO, Samuel BI, Chris AO, Oladimeji RA, Idowu OO, Okoduwa UJ. Attitudes, perceptions and barriers to research and publishing among research and teaching staff: a case study. *bioRxiv*. 2018. <https://doi.org/10.1101/347112>
18. Ibn Auf AAH, Ahmed ME, Ahmed MH. Perception, barriers, and practice of research among teaching staff at five Sudanese medical faculties. *J Public Health Emerg*. 2018;2:22. <https://doi.org/10.21037/jphe.2018.07.01>