

Quality assurance of assessment in medical education: A faculty workshop for facilitators by University of Port Harcourt's College of Health Sciences

Yarhere Iro E^{1*}, Akadiri Oladimeji A²

¹Department of Paediatrics, College of Health Sciences, University of Port Harcourt, Rivers state, Nigeria

²Department of Oral and Maxillofacial Surgery, College of Health Sciences, University of Port Harcourt, Rivers state, Nigeria

*Corresponding author: Dr. Iro Enameguolo Yarhere

Department of Paediatrics, College of Health Sciences, University of Port Harcourt, Port Harcourt, Rivers state, Nigeria

Abstract

Background: Assessment is the systematic process of testing the competency of learners and need for further learning in line with specified learning outcomes. For the assurance of quality, the validity and reliability of the assessment tools for any given competence should be sacrosanct, hence, the need for standardized assessment in medical education. In other to gauge and enhance the capacity of medical educators in students' assessment, a workshop was organised to fill the knowledge and skills gap of faculty members and other interested medical education facilitators.

Methods: The College of Health sciences, University of Port Harcourt organised a 3-day medical education workshop themed: "Quality assurance of assessments in medical education". Participants were mainly, faculty members of the College of Health Sciences of the University of Port Harcourt and the Niger Delta University. The exercise involved both didactic and hands-on practical sessions facilitated by 6 different medical education experts from within Nigeria and the United Kingdom. There were two break-out sessions each day with hands-on practice in constructing multiple choice questions, curriculum mapping, benchmarking and construct alignments. Pre- and post- tests were administered to compare participants' knowledge baseline and achievements from the workshop. The results were presented in charts and estimation of percentage differences was done.

Results: The workshop was received favourably by participants and there was significant improvement in knowledge gain. The proportion of respondents with high scores increased in the post-test evaluation compared to the pre-test. The overall mean score was 4.63 (1.99) in the pre-test and 7.45 (2.36) in the post test, and the difference in mean was significant, $t = -8.31$, $p < 0.001$.

Discussion: Though it is recommended that all faculty members should obtain medical education competency, not all can go through the rigors of certification or obtaining a degree. So, continuous faculty development in both formal and /or informal settings will have to take place for quality assurance in teaching and assessment with a view to improving trainees' competencies and ultimately, the quality of patient care.

Keywords: Quality assurance, medical education, assessment, Nigeria

Date of Submission: 14-03-2023

Date of Acceptance: 29-03-2023

I. Introduction

Assessment is any formal or informal action used to get information about the competence or proficiency of a candidate based on specific teachings or learning outcomes the candidate is supposed to portray¹⁻². Assessment is usually formative, where the facilitator or assessor gets information about the progress of the candidate or summative, where the candidate is graded and / scored to be allowed to proceed to the next learning process or face remediation or referral to study more. Formative assessments are used to guide future learning, promote reflection (self-introspection), and provide assurance. Assessing medical education learning is relatively tasking because of the clinical and analytic components attached and many schools have devised methods to assure that products of their institutions meet global best practices. There is no one size fits all in medical education assessment of learning outcomes because there are several factors playing out in various schools; the local environment and curriculum needs, the technology available, the facilitators' number, competence in teaching and assessing, and the learning methods the students are subjected to.³

All assessment methods have strengths and weaknesses, and opportunities for improvement and external forces that threaten their utilisation.^{1, 4-6} Whatever assessment type is used must have in-built quality assurance to prevent capitulation in the long run. Traditionally, many medical schools in Nigeria have utilized the TRUE/FALSE multiple-choice questions and this is mainly to test knowledge and comprehension and to some extent, application.⁷⁻⁹ Most schools and faculties have continued with the negative marking style where candidates are penalized for a wrong answer in order to discourage guessing. Multiple choice questions remain the best tool to test various content areas and can be administered in relatively short periods. They are also easily standardized and straightforward to some extent.¹⁰ Essay type questions are becoming obsolete in many developed countries, but Nigeria and many African countries still use this style of assessment. The advantage of essay type question is that a candidate's command of language, style of delivery and content can be assessed at the same time.¹¹⁻¹³ It also promotes writing competence of the learner who will go on to become a scientist that will send articles to journal for publication. Many Nigerian medical schools and the postgraduate medical colleges have adopted the Objective Structured Clinical Examinations (OSCE) or Performance and Clinical Skills Examination (PACSE) for assessment since the past 10 years and streamlining the process to meet global best practices has been challenging, if not daunting.

As learning is being made student-centred, assessment should also be student-centred. Knowing that it is a driving tool for learning, facilitators must use assessment to help students achieve the learning objectives of their curriculum. Aligning intended learning outcomes with assessment tools should be structured in ways that make the assessment tool part of the learning process so the learners know what they are learning and how their competence will be assessed.^{10, 14, 15} Ensuring there is quality in the assessment process formed the basis for the workshop to help medical faculties in the University of Port Harcourt, Port Harcourt, Rivers state and Niger Delta University, Amasomma, Bayelsa state, build capacity in medical education assessment. The workshop explored principles and concepts for effective approaches to assessments in medical education. The workshop targeted senior faculty members who facilitate learning and assess learning outcomes without prior formal training. The overall goal of the workshop was to sensitize educators (faculty members) about the importance of quality assurance of assessment in medical education. It was also intended to formulate and implement a policy for learning assessment in the college. Participants were taught about the utility and benefits of quality assurance in assessment and their confidence enhanced in the use of various assessment methods in alignment with intended learning outcomes. They also learned how to produce quality questions to assess learning effectively.

II. Methods

In a collaboration between ACE-PUTOR and CENMERT in the College of Health Sciences, University of Port Harcourt, a 3—day medical education workshop was organised between 24th and 26th of August 2020. It was a virtual workshop on the zoom platform, and google classroom was used to deliver course materials to participants. Before the workshop proper commenced, participants were given a link to answer questions about the intended learning outcome of the workshop using their prior knowledge of the assessment in medical education. This link was available as a Google form and was open for 20 minutes after which, responses were no longer collected. There were 10 questions that tested knowledge of forms of assessments and their uses, curriculum mapping and blueprinting, and standard items on questions.

Participants

Six (6) resource persons and /or facilitators conducted the workshop. Though there were 216 registered intended participants, the daily active participants were 162 faculty members from University of Port Harcourt and Niger Delta University. The attendees were senior and junior faculty members who were getting exposed to formal medical education methods for the first time, though they have been teaching and assessing medical students and residents for a long time.

The schedule was divided into three main sessions:

Session I (seminars): lectures were delivered on the faculties' current assessment strategies and policies, curriculum mapping, assessment of learning and for learning, benchmarking system, constructive alignment, giving and receiving feedbacks from students and faculties, standard settings of questions, and basics on quality question items.

Session II (hands-on) : curriculum mapping, developing proper learning outcomes, marking criteria, marking templates, writing single best answer questions and basics on quality question items

Session III (discussion) : adopting the single best answer questions types, assessment for learning should be student-centred, giving students their expected learning outcomes for every learning activities, decide the assessment standards before the examinations,

The didactic lectures were given over 30 - 40 minutes periods with breathers in-between, and as stated above, they spanned the realm of assessment of learning, for learning and assessment as a learning tool, through

quality of assessment and verifying and assuring that assessments have quality control, and finally benchmarking, double marking system and setting quality multiple choice questions. There were 3 breakout sessions each day designated “Blue”, “Green” and “Red”. Each break out session was coordinated by 2 facilitators daily and the student-centred approach was used to help faculties learn the intended outcome. Participants then broke into smaller groups guided by a workshop facilitator to test the learner’s grasps of the previous session. The session closed in a plenary session with a report given from each small group, and general discussion of what was learned.

A post workshop test was conducted using the same questionnaire for the pre-test in order to find the delta between the pre-exposure and post exposure knowledge of the participants. The link was similarly opened for only 20 minutes as for the pre-test.

Evaluation Form

An evaluation form (Appendix A) was distributed in the Google form template at the conclusion of the workshop as feedback from participants. The evaluation form used a 3-point Likert scale (3 = Excellent, 2 = Good and 1 = poor) to rate the overall effectiveness of the workshop and the degree to which the objectives had been met. We developed the form to address the teaching, engagement of facilitators and contents of the presentations for the facilitators. Participants were asked about their ability to apply assessment plans for their learners. Also, we created open-response questions to allow for detailed answers about how learners felt about the workshop forms.

III. Results

Of the 204 registered participants, 162 actively participated daily by joining from their various stations via the zoom platform. Eighty-two and 84 participants respectively completed the pre-test and post-test assessment and consented to publishing the findings. One hundred and five participants completed the workshop evaluation form to rate the workshop content and execution and the performance of facilitators.

Assessment of participants’ knowledge of the intended learning outcomes from the workshop

There were 82 participants who completed and submitted the questionnaires in the pre-workshop assessments and 84 completed and submitted in the post-workshop assessment.

Figures 1 and 2 depict the total point distribution of respondents’ performances in the pre-test and post-test respectively. The overall mean score was 4.63 (1.99) in the pre-test, figure 1 and 7.45 (2.36) in the post-test, figure 2, and the difference in mean was significant, $t = -8.31$, $p < 0.001$.



Figure 1: Pre-test performance distribution



Figure 2: Post-test performance distribution.

Furthermore, in the pre workshop assessment, there were 6 frequently missed questions out of the 10 laid out in the questionnaire. Less than half the respondents got the correct responses to these questions. The differences in proportion of correct to incorrect responses in the pre-test were statistically significant for the frequently missed questions. However, following the workshop, the proportion of correct responses were much higher, and the differences were statistically (Figure 1).

Question	Correct responses
Consider these twin statements: "Formative assessment is assessment of learning (1); Summative assessment is assessment for learning (2)	24 / 82
With respect to Bloom's taxonomy, which is the highest level of cognition assessment?	25 / 82
One of the following is not an important characteristic of assessment methods in a medical programme	36 / 82
Blueprinting of assessment programmes is most important for:	31 / 82
The marking scheme which assesses the whole task according to one scale, and are appropriate for less structured tasks, such as open-ended problems is described as:	34 / 82
The process of selecting and using student examination scripts to illustrate performance standards at different levels and training markers with the materials to ensure that assessment decisions are always consistent is called:	32 / 82

Figure 3: The proportion of respondents with correct responses to frequently missed questions inpre-test.

Formal feedbacks were received from 105 participants out of the 162 active participants at the end of the workshop, and 81% thought the workshop was useful to their practice as facilitators of learning. More participants scored the workshop as good rather than excellent in the domains of workshop support (51.4%), audio-visual technical support (61.9%), virtual training platform (53.3%), and interaction with participants (49.5%). Individual facilitators had more excellent scores than good and very few participants rated the facilitators as poor in any of the 3 domains evaluated.

IV. Discussion

Evidence of validity is essential to the assessment and evaluation instruments used in medical education. Aiming for such validity evidence promotes improved outcomes for learners with the eventual goal of impacting patient care outcomes. Medical educators need to be able to gather such evidence for their own instruments and for instruments adapted from another contexts or populations of learners.

Summary of Impact

Overall, participants' self-reported responses to the Likert-scale items, as well as their narrative comments, indicated that the workshop was effective. The topics were selected to reflect the objectives of the workshop i.e., enlightenment and development of culture of proper assessment of students and faculties. While many faculties have used continuous assessment and understand that continuous assessment is a form of

formative assessment, from the responses given before the workshop, not many knew that formative assessment was assessment for learning. Formative assessment is a process of following up a student's progress in the curriculum and syllabus with a view for remediation and preparation for the summative assessment.¹⁶⁻¹⁸ It was also obvious that participants got the view that assessments must be student-centred and not teacher-centred, so that assessments are made based on the learning outcomes projected. During the discussion session, some questions raised about student centeredness of assessment were whether students should know the sort of questions that will be asked in their assessments.¹⁷ The consensus from the facilitators was in the affirmative i.e., some universities have faculty banks of questions and though students do not have access to these, faculties who pool into these question banks have standardized arrays of questions that they use while preparing their lectures and the learning objectives.¹⁹⁻²¹ The questions come from the learning objectives and their intended learning outcomes, so students learn based on the learning outcomes and the assessments that will come from them. When students know what they will be assessed on, they are likely to learn around those intended learning outcomes, leaving other aspects unattended to and no one can take that away from the anxious students who know they have a lot to learn but with little time and will always ask areas of concentration.^{22,23}

It was also obvious that though participants know the concept of validity, reliability and reproducibility,^{4, 16, 24} not many knew how to construct questions that had all three properties or which assessment types had to have all these properties or some of them. Norm referencing and criterion referencing were new to participants, and they came to terms to the fact that constructing reliable questions can be difficult mainly because of sampling errors and also inexperience on the part of the faculties who are used to teacher centred questions standards. A way around this was the concept of constructive alignment,¹⁰⁻¹⁴ where assessments were aligned with the intended learning outcome and faculties were made to understand that writing questions need practice over time and almost always happens as the lessons are being prepared. Participants also knew that at some point, setting questions that will be assess competence and pass this truly and incompetence and fail this truly will need continuous training and that as there is no perfect system, compromise may have to be stuck.

While benchmarking and double marking systems of assessments^{25,26} were not new to participants, the utility was limited to some faculties and departments in the Colleges. Most departments use this in the objective clinical skills assessments and essay examinations. The key take home in the essay assessment was whether to do away with it totally or to modify it to a full mark scoring system or the traditional closed marking system where ratings are either 20/80% or 30/70% and following extensive debates, the consensus was for a committee to articulate the reasoning of the faculties and find ways of recommending what meets best global practices. Making a benchmarking process will need commitment on the part of the faculties and policies will need to be developed and enforced so all departments in the college use this tool in the assessment process and there must be evidence to validate their claims.

Feedbacks are not commonplace in the medical education environment in the Colleges and possibly in Nigeria also. If faculties practiced feedbacks, they were more to the students and rarely of the faculties or teachers i.e., medical students rarely give feedbacks or evaluate their teachers which is common practice in the more developed countries, and this acts as a tool for assessing fitness to practice for the faculties.²⁷⁻²⁹ The discussion tailed into the development of a formal faculty evaluation by students moving forward, but there was anecdotal evidence that students were reluctant to go into this practice even when its anonymized possibly for fear of repercussions, even when reassured. How best to make the students comfortable enough to make informed, and unbiased evaluation of their faculties will be a challenge and has to be done with caution. It should proceed after wide consultation with the student's representative, making them understand that this is a process that helps faculty development.

The active application exercises and facilitated feedback during the workshop allowed learners to reflect in action (i.e., in real time) on whether they were meeting a particular educational objective. The technical organisation (audio-visual and platform for the virtual meeting) was good, with few hitches in day II, but overall, the participants were able to see the screens and hear the facilitators and discuss among themselves during the sessions. This is the first virtual workshop organised by the College and possibly, the University and also on medical education. Further implementation and evaluation phases should focus on widespread implementation of the work initiated during the workshop. This would add more rigor to the assessment process in our Colleges of Health sciences, aiming to attain global best practices.

In summary, the workshop was able to achieve its intended outcome and there were take home messages that the colleges will have to work on, and these include but not limited to adopting standard based examinations with respect to multiple choice questions, essays and OSCE/PACSE. Examiners will need to be bench marked and assessed for their fitness to mark scripts. They must also undergo anonymized medical student evaluations during the curriculum or semester year. In writing multiple choice questions, these will have to be single best answers and not the traditional "True and False". While this is being adopted, the negative marking will have to be abolished totally. Should the essay type questions continue to be used, then it must have

word limits, marking schemes and open system of awarding marks. Very important conclusion from the workshop was that all faculty members are encouraged to undergo some medical education training with certifications and there has to be some regular training and retraining in various aspects of medical education.

Acknowledgements

We acknowledge our resource persons, Prof Harish Thampy, Ibiwari Erekosima, Tudor Chinnah, Abiodun Arigbede, Oladimeji Akadiri, and the participants from the 2 universities. We also acknowledge the Africa centre of excellence for public health and toxicology, ACE-PUTOR

DECLARATIONS

Funding: This workshop was sponsored by the College of Health Sciences, University of Port Harcourt.

Conflict of interest: The authors declare no conflict of interest.

Ethical approval: As no human parts or biological samples were used for this research, ethical approval was waived by the research ethics committee of the University of Port Harcourt.

References

- [1]. Swanwick T, Chana N. Workplace assessment for licensing in general practice. *Br J Gen Pract.* 2005;55:461-467.
- [2]. Schuwirth LWT, van der Vleuten CPM. How to design a useful test: The principles of assessment. In: Swanwick, editor. *Understanding medical education: evidence, theory and practice.* West Sussex: John Wiley & Sons; 2014. p. 243-45.
- [3]. Bazargan-Hejazi S, Negrete Manriquez JA, McDermoth-Grimes M, Parra EA, Prothrow-Stith D. Underrepresented in medicine students' perspectives on impactful medical education. *BMC Med Educ.* 2022;22:904.
- [4]. Downing SM. Reliability: on the reproducibility of assessment data. *Medical education.* 2004;38(9):1006-12
- [5]. Norcini JJ. Current perspectives in assessment: the assessment of performance at work. *Medical education.* 2005;39(9):880-9. doi: 10.1111/j.1365-2929.2005.02182.x
- [6]. Norcini JJ, McKinley DW. Assessment methods in medical education. *Teaching and teacher education.* 2007;2(2):3-7
- [7]. Belay, L.M., Sendekie, T.Y. & Eyowas, F.A. Quality of multiple-choice questions in medical internship qualification examination determined by item response theory at Debre Tabor University, Ethiopia. *BMC Med Educ* 22, 635 (2022). <https://doi.org/10.1186/s12909-022-03687-y>
- [8]. Zaidi NLB, Grob KL, Monrad SM, Kurtz JB, Tai A, Ahmed AZ, Gruppen LD, Santen SA. Pushing Critical Thinking Skills With Multiple-Choice Questions: Does Bloom's Taxonomy Work? *Acad Med.* 2018 Jun;93(6):856-859. doi: 10.1097/ACM.0000000000002087. PMID: 29215375.
- [9]. Young, M., Cummings, BA. & St-Onge, C. Ensuring the quality of multiple-choice exams administered to small cohorts: A cautionary tale. *Perspect Med Educ* 6, 21–28 (2017). <https://doi.org/10.1007/s40037-016-0322-0>
- [10]. Crossley J, Johnson G, Booth J, Wade W. Good questions, good answers: construct alignment improves the performance of workplace-based assessment scales. *Med Educ.* 2011 Jun;45(6):560-9. doi: 10.1111/j.1365-2923.2010.03913.x.
- [11]. Kunjappagounder P, Doddaiiah SK, Basavanna PN, Bhat D. Relationship between difficulty and discrimination indices of essay questions in formative assessment. *J Anat Soc India* 2021;70:239-43.
- [12]. Kaipa, Roha. (2020). Multiple choice questions and essay questions in curriculum. *Journal of Applied Research in Higher Education.* 2020;13(1):16-32.
- [13]. Shakurnia A, Alijani H, Najjar S, komeili H, Elhampour H. The Effect of Two Assessment Methods on Exam Preparation and Study Strategies: Multiple Choice and Essay Questions. *Iranian Journal of Medical Education* 2013; 13 (4) :306-318
- [14]. Martone A, Sireci SG. Evaluating alignment between curriculum, assessment, and instruction. *Review of educational research.* 2009.79(4):1332-61
- [15]. Whitaker AA, Jenkins JM, Duer JK. Standards, curriculum, and assessment in early childhood education: Examining alignment across multiple state systems. *Early Childhood Research Quarterly.* 2022;58:59-74
- [16]. Büssing O, Ehlers JP, Zupanic M. The prognostic validity of the formative for the summative MEQ (Modified Essay Questions). *GMS J Med Educ.* 202138(6):1-20. doi: 10.3205/zma001495.
- [17]. Ma T, Li Y, Yuan H, Li F, Zhan Y, Yao J, et al. Reflection on the teaching of student-centred formative assessment in medical curricula: an investigation from the perspective of medical students. *BMC Med Educ.* 2023;23(141):1-20.
- [18]. Yuan W, Li Z, Han J, Chu H, Lu Shan, Gu Shixian, et al. Improving the resident assessment process: application of App-based e-training platform and lean thinking. *BMC Med Educ.* 2023;23(134):1-9.
- [19]. Farmer EA, Page G. A practical guide to assessing clinical decision-making skills using the key features approach. *Med Educ.* 2005 Dec;39(12):1188-94. doi: 10.1111/j.1365-2929.2005.02339.x.
- [20]. Chaudhary, N., Bhatia, B., Mahato, S., & Agrawal, K. Multiple Choice Questions-Part II (Classification, Item Preparation, Analysis and Banking). *Journal of Universal College of Medical Sciences.* 2014; 2(3): 54–59. doi.org/10.3126/jucms.v2i3.11830
- [21]. Jordan L, Bovill C, Othman SM, Saleh AM, Watters N. Is student-centred learning a Western concept? Lessons from an academic development programme to support student-centred learning in Iraq. *Teaching in Higher Education.* 2014;19(1):13-25
- [22]. Khoshhal KI, Khairy GA, Guraya SY, Guraya SS. Exam anxiety in the undergraduate medical students of Taibah University. *Medical teacher.* 2017;39:S22-S26.
- [23]. Bashir MBA, Albadawy IMAH, Cumber SN. Predictors and correlates of examination anxiety and depression among high school students taking the Sudanese national board examination in Khartoum state, Sudan: a cross-sectional study. *The Pan African Medical Journal.* 2019;33:69:1-9. doi:10.11604/pamj.2019.33.69.17516
- [24]. Speyer R, Pilz W, Van Der Kruijs J, Brunings JW. Reliability and validity of student peer assessment in medical education: a systematic review. *Med Teach.* 2011;33(11):e572-85. doi: 10.3109/0142159X.2011.610835
- [25]. Wilkinson TJ, Hudson JN, Mccoll GJ, Hu WC, Jolly BC, Schuwirth LW. Medical school benchmarking - from tools to programmes. *Med Teach.* 2015 Feb;37(2):146-52. doi: 10.3109/0142159X.2014.932902
- [26]. Orjuela-Grimm, M., Butsch, W.S., Bhatt-Carreño, S. et al. Benchmarking of provider competencies and current training for prevention and management of obesity among family medicine residency programs: a cross-sectional survey. *BMC Fam Pract* 22, 132 (2021). <https://doi.org/10.1186/s12875-021-01484-y>
- [27]. Watling CJ, Ginsburg S. Assessment, feedback and the alchemy of learning. *Med Educ.* 2019;53(1):76-85. doi: 10.1111/medu.

- [28]. Bates J, Konkin J, Suddards C, Dobson S, Pratt D. Student perceptions of assessment and feedback in longitudinal integrated clerkships. *Medical education*. 2013;47(4):362-374.
- [29]. Lam L, Jackson K, York M et al. Improving the Clinical Learning Environment as Medical Students Through the Learning Environment Assessment and Feedback Committee. *Acad Med*. 2022;97:S133.

Dr.IroroEnameguoloYarhere, et. al. "Quality assurance of assessment in medical education: A faculty workshop for facilitators by University of Port Harcourt's College of Health Sciences (Sentence case)." *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 13(02), (2023): pp. 38-44.