**Original Article**

# Challenges Associated with Learning Oral Diagnostic Sciences: A Multicenter Study in Nigeria

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## ABSTRACT

***Introduction***: Oral diagnostic sciences (ODS) comprise the subjects, oral pathology, oral medicine, oral radiology and the functional integration of these into the oral diagnostic services. Oral diagnostic science has peculiar challenges with learning and training in sub-Saharan Africa. Several barriers that may impede effective clinical teaching include inadequate institutional financial support and lack of access to appropriate educational space and resources. The aim of this study was to categorize challenges of learning ODS in Nigeria.

***Methods***: This was a cross sectional survey of undergraduate dental students (UDS) and resident doctors (RDS) in dentistry in five institutions in Nigeria. The study included 286 participants comprised of 199 UDS and 87 RDS. Information about challenges of trainer, trainee and facilities was obtained by using pretested structured questionnaires. Data was analyzed using SPSS version 23 and tests of associations between variables were determined using Chi-square. The level of significance was set at $p < 5\%$.

***Results:*** The mean age of the study participants was 27.2 ($\pm$ 4.6) years and 60.6% were males. The majority, 72.4% of RDS and 64.3% of UDS, indicated that getting a good ODS education was important to them. Few, 19.5% of RDS and 8.5% of UDS indicated that they would consider ODS as a career. While 37.9% of RDS decided that their examinations are fair and objective, 50.8 % of UDS agreed that their examinations were fair and objective ($p < 0.05$). The percentage of RDS and UDS which felt that ODS consultants sometimes give contrary information to textbook material were 26.4% and 29.1% respectively, however 28.7% of RDS and 34.2% of UDS were undecided about this issue. Thirty-eight (43.7%) specified that lack of a structured postgraduate curriculum in ODS caused their challenge with learning

***Conclusions:*** Trainee level affected the participants' perceived challenges of learning ODS. Despite the differences, the results showed that most of the challenges were common to both undergraduate and postgraduate training.

## INTRODUCTION

Oral diagnostic sciences (ODS) comprise the subjects, oral pathology, oral medicine, oral radiology and the functional integration of these into the oral diagnostic services. ODS is an integral aspect of dental education that has peculiar challenges with learning and training of both undergraduate and postgraduate students, especially

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in sub-Saharan Africa. One reason maybe that the public funding of education and earning capacity of the population in sub-Saharan Africa is generally poor compared with other world statistics[1]. Another general reason is that no training in specific teaching skills was provided to earlier generations of doctors. Teaching was a skill that trainers were just expected to possess or acquire[2]. A recent report recognized several barriers that impede effective clinical teaching, including time constraints, inadequate institutional financial support, lack of access to educational specialists, and lack of access to appropriate educational space and resources[3]. The aim of this study therefore is to itemize and categorize specified challenges of learning ODS in Nigeria.

## METHODS

This was a cross sectional survey of undergraduate dental students (UDS) and resident doctors (RDS) in dental surgery in five institutions in Nigeria (University of Ibadan and the University College Hospital, University of Lagos and Lagos University Teaching Hospital, University of Port-Harcourt and University of Port-Harcourt Teaching Hospital, University of Benin and University of Benin Teaching Hospital, Obafemi Awolowo University and Obafemi Awolowo University Teaching Hospital). The study included 286 participants comprised of 199 UDS and 87 RDS. Information about challenges of trainer, trainee and facilities was obtained from participants using pretested structured questionnaires. Data was analyzed using SPSS version 23 and tests of associations between variables were determined using Chi-square. The level of significance was set at $p < 5\%$.

## RESULTS

The mean age of the study participants was 27.2 ($\pm$ 4.6) years and 60.6% were males. The majority, 72.4% of RDS and 64.3% of UDS, indicated that getting a good ODS education was important to

them. A high proportion showed that there was need for more time to study ODS. Few, 19.5% of RDS and 8.5% of UDS indicated that they would consider ODS as a career (Table 1). Concerning the adequacy of number of ODS trainers, 46% of RDS agreed (whether mildly of strongly) that the number of trainers of ODS were inadequate and 23.6 % of UDS agreed that the number of trainers of ODS were inadequate ($p < 0.05$). While 37.9% of RDS decided that their examinations are fair and objective, 50.8 % of UDS agreed that their examinations were fair and objective ($p < 0.05$) (Table 2). When asked if ODS consultants explain difficult concepts sufficiently, 27.6% of RDS and 33.6% of UDS indicated that they do not explain sufficiently. The percentage of RDS and UDS which felt that ODS consultants sometimes give contrary information to textbook material were 26.4% and 29.1% respectively, however 28.7% of RDS and 34.2% of UDS were undecided about this issue (Table 2). Approximately equal percentages of RDS and UDS specified (strongly and mildly disagree) that the hall where ODS lectures/seminars are taken were not comfortable enough for teaching and learning (34.2% and 33.3% respectively). Eighteen (20.7%) of RDS indicated that ODS seminars and clinical exposure were inadequate for their training and 38 (43.7%) specified that lack of a structured postgraduate curriculum in ODS caused their challenge with learning (Table 3). Twenty (22.9%) of RDS indicated that the rotation time in ODS was inadequate. Majority, 57.6% of RDS and 53.3% of UDS, specified that the available equipment for investigations in ODS were not adequate for their training. While 74.7% of RDS indicated that exchange training program in another institution would enhance learning of ODS, 55.8 % of UDS indicated that exchange training program in another institution would enhance learning of ($p < 0.05$) (Table 3).

## Table 1: Characteristics of the learner (values recorded as percentages)

| RESIDENT DOCTORS | Strongly disagree | Mildly disagree | Undecided | Mildly agree | Strongly agree |
|---|---|---|---|---|---|
| For the most part, learning ODS has been a pleasant experience | 5.7 | 4.6 | 10.3 | 51.7 | 27.6 |
| My ODS consultants demand too much work from me | 24.1 | 31.0 | 25.3 | 16.1 | 3.4 |
| Getting a good ODS education is important to me | 2.3 | 0.0 | 4.6 | 20.7 | 72.4 |
| I learn only enough ODS material to pass examinations | 26.4 | 19.5 | 13.8 | 31.0 | 9.2 |
| I look forward to going to most of my ODS seminars | 6.9 | 4.6 | 21.8 | 42.5 | 24.1 |
| I should spend more time studying ODS | 4.6 | 12.6 | 12.6 | 32.2 | 37.9 |
| If my ODS consultants demanded more, I would probably work harder | 10.3 | 9.2 | 25.3 | 27.6 | 27.6 |
| I would consider ODS as a career | 17.2 | 9.2 | 34.5 | 19.5 | 19.5 |
| Regular attendance at ODS seminars will enhance my training | 2.3 | 4.6 | 10.3 | 42.5 | 40.2 |
| Most ODS seminars are uninteresting | 21.8 | 33.3 | 23.0 | 16.1 | 5.7 |
| Most ODS seminars are very interesting | 4.6 | 10.3 | 27.6 | 43.7 | 13.8 |
| All the content of ODS are relevant to my successful future practice | 6.9 | 4.6 | 13.8 | 39.1 | 35.6 |
| None of the content of ODS are relevant to my successful future practice | 62.1 | 23.0 | 10.3 | 2.3 | 2.2 |
| CLINICAL UNDERGRADUATE STUDENTS | Strongly disagree | Mildly disagree | Undecided | Mildly agree | Strongly agree |
| For the most part, learning ODS has been a pleasant experience | 6.5 | 8.5 | 18.1 | 43.2 | 23.6 |
| My ODS teachers demand too much work from me | 9.0 | 24.1 | 20.6 | 31.2 | 15.1 |
| Getting a good ODS education is important to me | 3.0 | 3.5 | 15.1 | 14.1 | 64.3 |
| I learn only enough ODS material in school to pass exams | 14.1 | 19.1 | 22.6 | 26.6 | 17.6 |
| I look forward to going to most of my ODS classes | 5.0 | 11.6 | 18.6 | 31.2 | 33.7 |
| I should spend more time studying ODS | 3.0 | 4.0 | 19.1 | 29.1 | 44.7 |
| If my ODS teachers demanded more, I would probably work harder | 10.6 | 12.6 | 26.1 | 26.1 | 24.6 |
| I would consider ODS as a career | 18.1 | 11.1 | 48.2 | 14.1 | 8.5 |
| Compulsory school attendance should be abolished | 20.1 | 20.1 | 24.1 | 18.6 | 17.1 |
| Most ODS lectures are uninteresting | 15.6 | 30.7 | 22.6 | 22.6 | 8.5 |
| Most ODS lectures are very interesting | 12.6 | 17.1 | 24.6 | 36.2 | 9.5 |
| All the content of ODS courses are relevant to my successful future practice | 4.0 | 5.0 | 18.1 | 28.6 | 44.2 |
| None of the content of ODS courses are relevant to my successful future practice | 63.3 | 14.6 | 15.6 | 4.5 | 2.0 |

## Table 2: Characteristics of the trainer (values recorded as percentages)

| RESIDENT DOCTORS | Strongly disagree | Mildly disagree | Undecided | Mildly agree | Strongly agree |
|---|---|---|---|---|---|
| I feel ODS consultants actually care about my success | 4.6 | 4.6 | 29.9 | 37.9 | 23.0 |
| ODS consultants do not explain difficult concepts sufficiently | 18.4 | 37.9 | 16.1 | 16.1 | 11.5 |
| The way my ODS consultants speak [volume, grammar, intonation, speed] affects learning of ODS | 19.5 | 19.5 | 26.4 | 14.9 | 19.5 |
| ODS consultants sometimes give contrary information to textbook material | 24.1 | 20.7 | 28.7 | 20.7 | 5.7 |
| I feel the number of consultants training me in ODS is inadequate | 18.4 | 9.2 | 26.4 | 23.0 | 23.0 |
| I feel postgraduate ODS examinations are fair and objective | 6.9 | 9.2 | 46.0 | 25.3 | 12.6 |

| CLINICAL UNDERGRADUATE STUDENTS | Strongly disagree | Mildly disagree | Undecided | Mildly agree | Strongly agree |
|---|---|---|---|---|---|
| I feel ODS lecturers actually care about my success | 8.0 | 7.5 | 17.6 | 29.1 | 37.7 |
| ODS lecturers do not explain difficult concepts sufficiently | 16.1 | 26.1 | 24.1 | 25.6 | 8.0 |
| The way my lecturer speaks [volume, grammar, intonation, speed] affects learning of ODS | 14.6 | 15.1 | 23.6 | 26.1 | 20.6 |
| ODS lecturers sometimes give contrary information to textbook material | 18.1 | 18.6 | 34.2 | 23.6 | 5.5 |
| I feel the number of lecturers teaching ODS is inadequate | 19.1 | 22.1 | 35.2 | 17.6 | 6.0 |
| The methods of assessment in ODS are fair and objective | 8.5 | 12.1 | 28.6 | 38.2 | 12.6 |
| I feel the number of examinations in ODS is insufficient to assess my learning | 22.6 | 23.6 | 34.2 | 10.6 | 9.0 |

## Table 3: characteristics of the learning "environment" (values recorded as percentages)

| RESIDENT DOCTORS | Strongly disagree | Mildly disagree | Undecided | Mildly agree | Strongly agree |
|---|---|---|---|---|---|
| The hall where ODS seminars take place is comfortable enough for teaching and learning | 8.0 | 25.3 | 54.0 | 12.6 | 0.0 |
| I feel the duration of ODS seminars are too long | 4.6 | 18.4 | 42.5 | 24.1 | 10.3 |
| I feel the ODS seminars and clinical exposure adequately train me | 4.6 | 16.1 | 23.0 | 41.4 | 14.9 |
| My problem with learning ODS is the lack of a structured postgraduate curriculum | 6.9 | 10.3 | 39.1 | 25.3 | 18.4 |
| The current rotation time I spend in ODS is adequate | 10.3 | 12.6 | 21.8 | 29.9 | 25.3 |
| I prefer watching projected lectures, diagrams, illustrations and graphics | 2.3 | 6.1 | 20.7 | 37.9 | 32.2 |
| I prefer listening to lectures, discussion or recorded lecture tapes | 10.3 | 16.1 | 20.7 | 33.3 | 19.5 |
| I prefer reading textbooks and forming notes by myself | 13.8 | 20.7 | 25.3 | 31.0 | 9.2 |
| I learn better by practical clinical application of ODS | 1.1 | 3.4 | 8.0 | 26.4 | 60.9 |
| I feel the available equipment for investigations in ODS in my institution are adequate for my training | 28.7 | 28.7 | 21.8 | 9.2 | 11.5 |
| I feel exchange training programs in another institution will enhance my learning of ODS | 1.1 | 3.4 | 20.7 | 20.7 | 54.0 |
| CLINICAL UNDERGRADUATE STUDENTS | Strongly disagree | Mildly disagree | Undecided | Mildly agree | Strongly agree |
| My lecture hall is comfortable enough for teaching and learning | 19.1 | 15.1 | 12.6 | 33.7 | 19.6 |
| I feel the duration of ODS lectures are too long | 15.1 | 28.1 | 28.1 | 19.1 | 9.5 |
| I am able to understand most ODS morning lectures | 4.0 | 5.5 | 17.1 | 34.2 | 39.2 |
| I am able to understand most ODS afternoon lectures | 26.6 | 28.6 | 24.6 | 14.6 | 5.5 |
| The current lectures system of teaching helps with ODS comprehension | 14.1 | 14.6 | 37.2 | 24.1 | 10.1 |
| I prefer watching projected lectures, diagrams, illustrations and graphics | 0.5 | 2.5 | 16.1 | 28.1 | 52.8 |
| I prefer listening to lectures, discussion or recorded lecture tapes | 4.0 | 14.1 | 22.2 | 25.1 | 24.6 |
| I prefer reading textbooks and forming notes by myself | 19.1 | 22.6 | 25.6 | 21.6 | 11.1 |
| I learn better by practical clinical application of ODS | 2.0 | 2.0 | 17.1 | 24.1 | 54.8 |
| I feel the available equipment for investigations in ODS in my institution are adequate for my training | 30.0 | 22.6 | 23.6 | 15.1 | 8.0 |
| I feel the ODS clinics are too crowded for proper learning | 8.0 | 18.1 | 27.6 | 17.1 | 29.1 |
| I feel exchange training programs in another institution will enhance my learning of ODS | 2.0 | 4.5 | 28.1 | 21.1 | 44.2 |
| The clinical time is too short for adequate practical learning | 14.1 | 18.6 | 28.6 | 16.6 | 22.1 |

## DISCUSSION

In the present study majority of the participants agreed that getting a good ODS education is important, however various challenges including inadequate number of trainers, perceived lack of fair and objective examination, inadequate clinical exposure, lack of standard structured curriculum for residency, lack of adequate equipment's were indicated as challenges with learning of ODS in Nigeria. Similar to a study in Saudi Arabia[4], very few of the participants indicated their interests in choosing specialties in ODS as career which may be explained by the challenges associated with learning or training in ODS. Another reason for poor interest in ODS as a career choice maybe because of challenges with making satisfactory diagnosis, this was reported as a popular influencing factor affecting choice of dental specialty among Nigerian dental graduates[5].

A notably higher proportion of UDS agreed that examinations were fair and objective likely because they benefit from consistent classroom teachings and have a complete brochure of what they need to learn, this is not exactly so for the RDS training. Hence the RDS may feel they are being examined unfairly as the entire scope of knowledge expected from them by their trainers is not completely defined. However, there are guide booklets to the RDS training program and this, is expected, to be complemented by self-directed learning (SDL). SDL is a process in which an individual takes the initiative, without the help of others in planning, carrying out, and evaluating their own learning experiences[6]. SDL is an informal process that mainly takes place outside the classroom and Cross[7] reported that approximately 70% of adult learning is self-directed. Thus, we suggest that trainers make it clear to the RDS at the beginning of their program that although they have a guide, they must make SDL a priority approach to the postgraduate program.

More than a quarter of both UDS and RDS suggested that ODS consultants sometimes give contrary information to textbook material, while 28.7% of RDS and 34.2% of UDS were undecided about this issue. We think that one reason for such "contrary" information may be the difference between the experience and research of the trainer in the tropics compared to the documentation of trainers in the temperate regions, which is typically the source of these text used by learners. Another reason maybe the rapid availability of knowledge and change in knowledge which renders the textbook material "obsolete". The trainer therefore must make concerted efforts to clearly state the source of data being thought and explain that differences may exist. Trainers must also update their knowledge and teaching notes to reflect current trends in knowledge on the subject. For those who were undecided about the existence of contrary information or not, we suggest that this may indicate the lack of cross-checking facts in reference texts by the learners, or even a total lack of reference to any text. It may mean these categories of learners depend only on what they are able to obtain from class notes or seminars. This should be discouraged by developing innovative ways of engaging the learner in SDL through contact with additional teaching resources. Weimer described five key changes to make in driving learner-centered teaching, and one such modification is faculty sharing decision making about learning with students (in ethically responsible ways) and not faculty alone making the key decisions about learning for students[8]. This allows the learners to contribute to policies guiding their learning and hence increases their participation in actual learning

## CONCLUSIONS

Trainee level affected the participants' perceived challenges of learning ODS. Despite the differences, the results showed that most of the challenges were common to both undergraduate and postgraduate training. There is need for a common and comprehensive effort to find solutions to these challenges to enhance learning and training in ODS.

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