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The State of Optometric Education in India,1958-2022

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Background

Blindness and vision impairment are two of the most significant public health issues in India, which is home to 20.5% of all cases of blindness in the world, 22.2% of the world's low vision population and 21.9% of individuals with vision impairment.[1] Cataract is the leading cause of avoidable blindness in India, followed by uncorrected refractive errors.[1,2,3] Cataract accounts for 66% of all avoidable or preventable blindness while uncorrected refractive errors (30%) are the major cause of vision impairment.[4] In India, which has a population of more than 1 billion, there is a huge burden on ophthalmologists to tackle eyecare issues, especially the escalating prevalence of avoidable blindness and vision impairment.[1,2,3] The ophthalmologist-t--population ratio is 1:25,000 in urban areas and 1:219,000 in rural areas, which underscores a substantial workforce imbalance between the two settings.[5-9] One needs to undergo 8 years of training to become an ophthalmologist in India. On their own, ophthalmologists, who are expensive to train and few in number, cannot fulfill the country's current unmet eyecare needs.

Medical professions such as ophthalmology and other branches of medicine are regulated and accredited by the Indian Medical Association. Although the practice of optometry is recognized as an allied health profession by the Ministry of Health and Family Welfare, it is yet to be regulated. In India there is no regulatory body governing either the dispensing of optical appliances or optometry eye care, and this has led to various levels of certificate and diploma programs.

With respect to optometry and spectacle provision, published data show that India has 9,000 optometrists who have undergone a minimum training of 4 years and 40,000 optometrists who have undergone a training of 2 years.[10] It is estimated that 115,000 4-year trained optometrists would be required to give far-reaching eye care to individuals in the country.[11] India has a dearth of optometrists because of scarcity not only in number but also in terms of education and training. This shortage is due to the scarcity of schools that provide 4-year education programs in optometry according to globally accepted standards. Most eyecare needs in India are instead addressed by eyecare personnel who undergo a 2-year training program.[12] Currently, holders of optometry diplomas (2-year) and optometry degrees (4-year) are employed and offering services to the public at the primary and secondary eyecare levels with no differentiation with respect to salary or roles and responsibilities.

Development of optometry in India

Optometry was born in India approximately 65 years ago and has grown ever since. It was recognized as a profession in India to lessen the burden of refraction on ophthalmologists and address the vision care needs of a growing population by the National Program for Control of Blindness and Visual Impairment (NPCB&VI) set up by the Indian government.[13] Under NPCB&VI, the government of India established its first school of optometry (2-year program) in 1958 at the Gandhi Eye Hospital in Aligarh.[13] The 2-year trained optometrists were recognized by NPCB&VI and employed as Mid-Level Ophthalmic Personnel (MLOP) or Para Medical Ophthalmic Assistants (PMOAs) in the eye hospitals run by state and central government. Before the establishment of the first school of optometry, opticians who learned the trade as apprentices carried out the bulk of optical work and sight testing. There were only a few formally trained opticians from abroad.[14] By 1969, seven schools of optometry were established offering a 2-year program of instruction leading to a Diploma in Refraction and Optometry (DROpt) or a certificate of completion.[14] Refraction plays a limited role in eye examinations, and many ocular conditions can go unnoticed in a test that measures only refractive status; therefore, the need for a comprehensive optometry school arose. The first undergraduate 4-year degree program was established in 1985. Since then, several schools and colleges of optometry have been established that offer optometric education at the undergraduate, postgraduate and doctoral levels. A report by the India Vision Institute (IVI) suggested that as of July 2015, 164 institutions were providing optometry as a primary eyecare program in India.[15] According to the Indian Optometry Federation, an optometrist is someone receiving formal optometry training for a duration of 2 years or more.[6] This definition was adopted for this study.

Despite significant progress in establishing schools of optometry across the country, optometry in India has yet to define a governing body to regulate the profession, which has resulted in optometrists with varying levels of skill and competency offering services. Due to the unregulated environment, the training levels and scope of optometric practice in India have been divided in the past. In recent years, tremendous progress has been made toward establishment of a unified, standardized, regulated profession to meet the eyecare needs of the population at large.[10]

2-year diploma optometrists

A 1969 optometric services survey in Delhi, India, showed there were three types of practices related to the education level of the practitioner.[14] The first type comprised foreign-trained optometrists who successfully managed all the optometric needs (primary eye care) of their patients. The second type comprised holders of 2-year DROpt qualification. This type knew the significance of the tests they performed, were aware of the complexities of the visual system, and showed more concern for patients' visual welfare, though they were not managing all their of their patients' optometric needs. The third type were opticians who learned the trade as apprentices and were offering merchandise and sales services more so than visual welfare services.[14] Ocular conditions and ocular manifestations of systemic conditions went undetected when services were rendered solely toward refraction and spectacle dispensing. This was a concern for ophthalmologists who maintained that optometrists and opticians should be under ophthalmological supervision to ensure proper patient management.

4-year degree optometrists

The drawbacks of the 2-year diploma program led to the development of the 4-year degree program. In 1985, the Sankara Nethralaya Eye Hospital in Chennai established the Elite School of Optometry (ESO), the first to offer a 4-year baccalaureate in optometry. In 1994, ESO became an affiliate of the Birla Institute of Technology and Science (Pilani) and began offering Bachelor of Science (BS) and Master of Philosophy (MPhil) programs and, later, a doctoral program (PhD).[16] Following the Birla/ESO affiliation, the Bausch + Lomb School of Optometry was established in Hyderabad and other institutions began offering a 4-year degree program.[16] Since then, 124 schools of optometry offering a 4-year degree program have been established.[15] The University Grants Commission (UGC) is India's statutory body responsible for maintaining standards in higher education, and it has recognized optometry as a course that could be offered at the undergraduate, postgraduate and doctoral levels in the university setting.[17] State governments in the recent past have recognized the 4-year degree program in optometry and give institutional recognition to the optometry course. However, not all states have adopted this.

The degree programs are 4 years and include 1 year of internship at an eye hospital. The curriculum implemented across the degree colleges has been adapted from the Common Minimum Optometry Curriculum (CMOC) suggested by the Association of Schools and Colleges of Optometry India (ASCO-India) **(Table 1)**. At the undergraduate level in the first year, the curriculum covers the basic sciences and other subjects such as communication and computers. In the second year, ocular-related sciences, optics and some practical subjects are undertaken. The third-year curriculum is dedicated to core optometry and specialty subjects such as contact lenses, binocular vision, low vision care, pediatric and geriatric optometry, public health, research methodology and clinical exposure, as well as preparing students for internship when they are in the fourth year.

TABLE 1
Common Minimum Optometry Curriculum by ASCO-India

Year	Courses	Hours Theory (Practicals)	Courses	Hours Theory (Practicals)
I	**First Semester**		**Second Semester**	
	General Anatomy	32 (10)	Basic Biochemistry II	20 (20)
	General Physiology	40 (20)	Ocular Anatomy	36 (10)
	Basic Biochemistry I	27 (20)	Ocular Physiology	47 (14)
	Nutrition	10	Geometrical Optics I	40 (20)
	Geometrical Optics I	40	Physical Optics	37 (15)
			Clinics I	
II	**Third Semester**		**Fourth Semester**	
	Ocular Microbiology	18	Optometric Optics II	37
	Optometric Optics I	21	Visual Optics II	27
	Visual Optics I	30	Ocular Disease II	46
	Optometric Instruments	32	Basic Pharmacology	24
	Ocular Disease I	46	Pathology	20
	Clinical Examination of Visual System	29	Clinics III	60
III	**Fifth Semester**		**Sixth Semester**	
	Contact Lens I	37 (25)	Contact Lens II	30 (25)
	Low Vision Aid	21 (6)	Binocular Vision II	31
	Geriatric Optometry	20	Public Health and Community Optometry	26
	Pediatric Optometry	30	Dispensing Optometry	15
	Binocular Vision I	29	Occupational Optometry	20
	Systemic Disease	57	Clinics V	60
	Clinics IV			
Clinical Internship – Seventh and Eight Semester				

ASCO – India = Association of Schools and Colleges of Optometry in India

Table 1. *Click to enlarge*

World Council of Optometry curricular elements

In 2013, the World Council of Optometry (WCO) adopted a document on curricular components for an optometry program — "Curricular Support Elements for an Optometry Program" — for schools and colleges planning to begin or overhaul an optometry program.[18] The document considers 15 elements from an exhaustive eye assessment and builds up the education program content from the information and aptitudes that support every component. The WCO identified eight enabling science

subjects and 15 core optometry subjects that should be incorporated into the curriculum to prepare an optometrist to provide comprehensive eyecare service.

Among the 15 curricular elements recognized by the WCO, 10 elements are parts of a comprehensive eye examination, one element relates to patients' well-being, three elements are specific to assessment and care of pediatric, low vision and geriatric patients, and one element is linked with patient care involving continuous professional development and practice-based learning.

No empirical broad-based research has been conducted to evaluate the current state of optometric education in India. Therefore, this study aimed to review and compare the existing curricula in diploma (2-year program) and degree (4-year program) colleges in India with the curricular support elements developed by the WCO.

Methods

A document survey study, which involved schools and colleges offering diplomas and degrees in optometry, was used for this research. A list of schools and colleges of optometry in each zone of India was compiled based on information obtained by ASCO-India and IVI.[15] Due to the variable distribution of schools of optometry across India, a stratified random sampling technique was employed. The cohort of schools and colleges was further stratified based on whether the duration of optometric education was a minimum of 2 years or above. Based on the formula for sample size calculations of finite population correction for proportions, 32 colleges were included in the study.

Due to up-gradation of diploma colleges to degree level and the closure of many diploma colleges in the country, the sample size between the degree and diploma colleges is uneven. Keeping the total sample size to 32, 20 degree (4-year) colleges and 12 diploma (2-year) colleges were included in the study.

Institutes offering fewer than 2 years of formal education in optometry and colleges offering undergraduate programs that are not recognized by the UGC or provide education through the distance learning mode were excluded from the study

Curricular analysis

The curriculum followed in each school and college of optometry in each zone was studied in detail and collated. The curricula were obtained from the institute heads along with their written consent for the purpose of the study. The information provided was checked against the information provided at the institute websites. The information from each institution included the duration of the optometry program, the subjects offered in each year, the credits/hours of study for each subject, practical hours allotted, the pattern of examination, clinical training provided, laboratory facilities and the number of faculty teaching basic sciences and core optometry subjects. The information obtained was further used to identify the gaps existing across diploma and degree colleges. The existing optometry curriculum at the diploma and undergraduate level was then compared with the WCO document on curricular components for an optometry program.[18]

This research study was approved by the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (June 26, 2018, No: HSS/1635/017D).

Results

The study results showed that 12 diploma colleges (37%) and 20 degree colleges (63%) offered optometry at the undergraduate level. The majority of colleges that offered optometry at the undergraduate level were affiliated with state government universities (55%). The rest were either private universities (30%), deemed-to-be universities (10%) or autonomous institutes (5%). The affiliations of diploma colleges were variable in different states under study. Most of the colleges (six diploma colleges) were under the State Paramedical Council (50%). The nomenclature for the degree and diploma courses included in the study varied across the country as shown in **Table 2**.

TABLE 2
Nomenclature for Optometry Degree and Diploma Courses in India

	Nomenclature for Degree	Number of Colleges in the Study
1	B.Optom	8 (40%)
2	B.Sc in Optometry	6 (30%)
3	Bachelor in Optometry	2 (10%)
4	B.Opt	2 (10%)
5	B.Optometry	2 (10%)
	Nomenclature for Diploma	**Number of States in the Study**
1	Diploma in Optometry Technician (DOT)	4 (33%)
2	Diploma in Ophthalmic Assistant (DOA)	2 (17%)
3	Diploma in Ophthalmic Science	2 (17%)
4	Diploma in Optometry	1 (8%)
5	Diploma in Ophthalmic Technology	1 (8%)
6	Diploma in Optometry & Ophthalmic Technique	1 (8%)
7	Diploma in Para Medical Ophthalmic Assistant (PMOA)	1 (8%)

Table 2. *Click to enlarge*

Academic calendar and examination pattern

The academic calendar (final assessment) pattern was either semester (12 colleges) or annual (eight colleges) for degree colleges, but all the diploma colleges adhered to the annual examination pattern. A semester included 18 weeks, while the annual term included 36 weeks. The diploma and degree colleges in the study employed a traditional system (pen and paper examination along with practical and viva voce) of assessing and grading students during the program. This assessment and grading were done on the basis of theory and practical examinations in line with the dictates of the affiliating university or institute.

Student intake

The student intake in degree colleges was variable, ranging between 10 and 60, with an average of 29 ± 11 students. The intake for diploma institutes varied among the schools and colleges and also between government and non-government (private) institutes and ranged between 5 and 60 students per year.

Criteria for admission

The eligibility criteria for both diploma and degree students were the same, that is, 10 + 2 years of high school education within the science stream (physics, chemistry and math/biology). The minimum high school grade (in percentage) requirement (towards diploma/degree admissions) for school subjects was variable among diploma and degree colleges in the study, ranging from 40% to 60%. Selection of students into the diploma or degree program was based on either a written assessment followed by viva voce set by the individual institutes or affiliating university or based directly on high school marks.

Lecturing staff

The lecturing staff in the colleges offering a degree in optometry comprised medical faculty (non-ophthalmology), ophthalmologists, optometry teaching faculty and non-medical faculty. Postgraduates in optometry were employed as clinical instructors and teaching faculty in the degree (4-year) colleges. Most of the staff members lecturing at the diploma institutes were ophthalmologists and medical teaching faculty, and few optometrists were available to teach refraction and diagnostic procedures. The fourth year of the degree programs was solely dedicated to internship wherein students were involved in patient care in hospital and optical settings under supervision, while the 2-year diploma programs did not have a defined internship period in the curricula.

Curriculum for degree and diploma colleges

The study found that the curricula for diploma and degree colleges comprised subjects under basic or enabling sciences as well as core optometry subjects. Basic or enabling sciences were subjects that supported learning core optometry subjects. The diploma programs comprised a 2-year course and the curricula were ophthalmology-based, with emphasis on key clinical areas such as ophthalmic surgical instruments, outpatient procedures, patient care, minor surgical procedures, operation theater procedures, preoperative and postoperative care, eye banking, community ophthalmology and refraction. The diploma

programs were oriented more toward ophthalmology, preparing students for practice under the supervision of ophthalmologists, whereas the undergraduate programs were structured to prepare students for independent practice within the scope of optometry.

The basic/enabling science subjects such as General Anatomy, Cell Biology and Biochemistry, Physiology and Microbiology were included in all the degree colleges (20) included in the study. None (0%) of the diploma colleges included Psychology, Mathematics and Applied Statistics and Research Methodology in their curriculum. While 35% of the degree colleges included Mathematics in their curriculum, diploma colleges did not offer the subject (0%) as shown in **Figure 1**.

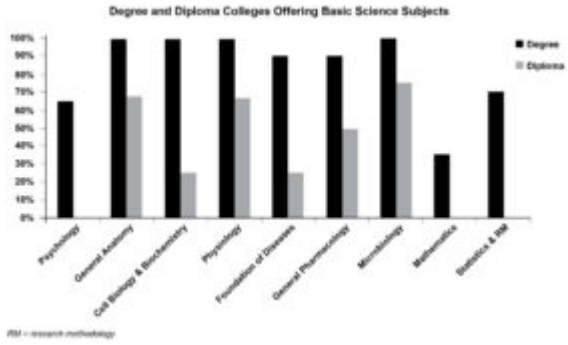

Figure 1. *Click to enlarge*

Ocular Anatomy and Ocular Physiology were the only two subjects offered by all the degree colleges (100%) and diploma colleges (100%). Also in the study, 50% of the degree colleges offered Practice Management as a subject, whereas diploma colleges did not offer this at all (0%). Optometry Specialties and New Technologies were also not offered by diploma colleges as shown in **Figure 2**.

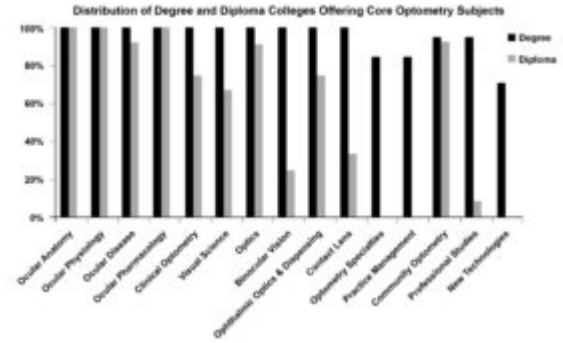

Figure 2. *Click to enlarge*

The subjects other than enabling/basic sciences and core optometry that were integrated into the mainstream curricula of the degree and diploma colleges involved in the study are listed in **Table 3**. The table indicates that degree colleges incorporated these subjects in the majority as compared with the diploma colleges. English and Communication Skills was incorporated into the majority (85%) of the degree colleges as was Computer Skills (75%). The diploma colleges involved in the study did not incorporate any subjects other than the basic and core optometry subjects. Only two diploma colleges (17%) offered English and Communication Skills and Computer Skills, and one diploma college (8%) offered Public Relations as a subject outside the basic and core optometry subjects.

TABLE 3
Other* Subjects Offered in Degree and Diploma Colleges

Subjects	Degree Colleges in the Study (20) (100%)	Diploma Colleges in the Study (12) (100%)
English and Communication Skills	17 (85%)	2 (17%)
Computer Skills	15 (75%)	2 (17%)
Hospital Administration	7 (35%)	0
Accountancy	6 (30%)	0
Regional Language	3 (15%)	0
Foreign Language	1 (5%)	0
Environmental Science	9 (45%)	0
Indian Medicine and Telemedicine	3 (15%)	0
Quality and Patient Safety	4 (20%)	0
Value Education	1 (5%)	0
Public Relations	3 (15%)	1 (8%)
Presentation Skills and Creative Thinking	1 (5%)	0
Professional Training	3 (15%)	0
Women's Rights	1 (5%)	0

** Subjects other than basic sciences and core optometry*

Table 3. *Click to enlarge*

Comparison of diploma and degree curricula with WCO curricular elements

The second stage of the study involved comparing the diploma and degree curricula with the WCO curricular elements. Of the 20 degree colleges included in the study, 83% (n = 17) included all the enabling science subjects listed by the WCO compared with 34% (n = 4) of the diploma colleges. The majority, 93% (n = 19), of the degree colleges included all the core optometry subjects in their curricula compared with 57% (n = 7) of the diploma colleges **(Figure 3)**.

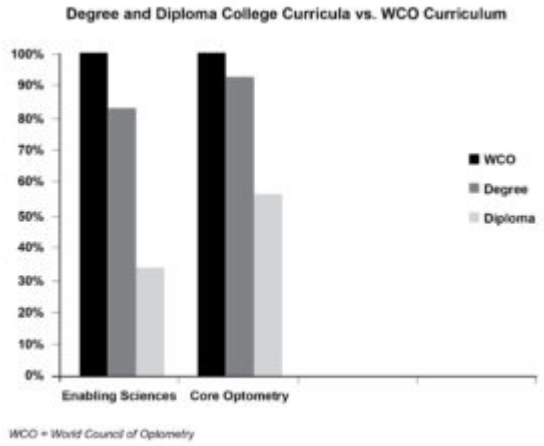

Figure 3. *Click to enlarge*

Syllabi were compared in terms of inclusion of enabling and core optometry subjects in order to assess the 10 elements of comprehensive eye care suggested by WCO. The analysis indicated that degree colleges included 76% of the subjects in enabling sciences and all subjects (100%) under core optometry to capacitate students with knowledge required to offer comprehensive eye examination. On the other hand, the diploma colleges offered 32% of the enabling science subjects and 82% of the core optometry subjects to enable students to offer comprehensive eye examinations **(Table 4)**.

TABLE 4
Degree and Diploma College Syllabi vs. WCO Comprehensive Eye Examination Curricular Elements

		Enabling Science		Core Optometry	
Item No.	Element of Comprehensive Eye Examination	Degree %	Diploma %	Degree %	Diploma %
1	Patient's case history	91	39	100	67
2	Anterior ocular adnexa for structure, condition and functioning	98	52	100	92
3	Anterior segment for structure, condition and functioning	98	52	100	88
4	Ocular media for structure, condition and functioning	98	52	99	75
5	Posterior segment for structure, condition and functioning	98	52	100	88
6	Quality of the visual pathway and sensory visual functioning	0	0	100	88
7	Refractive status of the eye	35	0	100	87
8	Binocular and oculomotor functioning	35	0	100	81
9	Suitability of spectacles and prescription writing	35	0	100	75
10	Contact lens wear suitability and prescribing	98	44	100	82
	Overall percentage %	76%	32%	100%	82%

WCO = World Council of Optometry

Table 4. *Click to enlarge*

Discussion

Diploma in optometry

The data reviewed for diploma colleges revealed that the duration of study required for a diploma was uniform (2 years) in all the states, but variations existed in terms of intake of students, curriculum, affiliation of diploma courses, nomenclature and lack of accreditation status involved in the training of MLOP or PMOAs as recognized by the NPCB&VI.[15] This correlates with the observations made in the study "Thoughts on Establishing Mid-Level Ophthalmic Personnel for VISION2020."[15] MLOP practice in either a hospital or community-based setting performing tasks such as refraction and assisting surgeons in the operating theater and with pre- and post-surgical care.[19] The subjects offered in the curriculum were ophthalmology-based and emphasized instrumentation, operation theater procedures, minor surgical procedures, preoperative and postoperative care as well as refraction. The enabling science subjects, which form the backbone of any optometry curriculum, were not included. The intended learning outcomes of the courses were not well-defined and the curriculum focused on preparing candidates for functions in primary or secondary eyecare centers and ophthalmological support services under supervision.[10] Ophthalmologists were the primary teaching faculty in diploma programs. Research was not a part of the curriculum as it was for degree colleges. The scope of practice of diploma holders was not defined.

Globally, diploma students are exposed to didactic lectures, practical and clinical training and are expected to provide level-two services (visual function services) of the Global Competency-Based Model Scope of Practice in optometry developed by the WCO.[20] In India, the diploma program prepares optometry practitioners to perform ophthalmological services under supervision and does not define their level of competence or scope of practice. Despite uniformity in diploma program duration, variations existed in nomenclature, curriculum and lack of accreditation status in India. In India, the lateral entry system allows a diploma holder to upgrade to a degree by seeking admission into the second year of the 4-year degree program as a full-time student. It is essential that diploma programs be aligned with the needs of the country through recognizing this segment of the workforce, ensuring uniformity in nomenclature and curriculum, and defining of scope of practice.

Degree in optometry

The data reviewed for degree colleges showed variations in terms of the nomenclature of the course, subjects offered in the curriculum, size of the intake of students and conduct of the examination. The findings of this study matched findings from a study conducted by Kunjeer et al. on the adequacy and relevance of the Indian optometry curricula to practicing optometrists.[21] The study showed that the optometry curricula offered at the undergraduate level in India are relevant and adequate, although business and legal issues in optometry are inadequately covered.[18] In the reviewed colleges, no major curriculum differences existed among the degree colleges as most of the subjects offered were based on the CMOC developed by ASCO-India. A defined scope of practice and entry and exit competencies are noted in India despite the fact that the curriculum implemented by degree colleges is comparable with the WCO curricular elements.

The subjects offered at the undergraduate level (apart from the enabling sciences and core optometry subjects, which were variable across the optometry schools) and integrated into mainstream university education were English and Communication Skills, Computer Skills, Hospital Administration, Accountancy, Regional Language, Foreign Language, Environmental Science, Indian Medicine and Telemedicine, Quality and Patient Safety, Value Education and Public Relations. The lecturing staff at the undergraduate level comprised basic science faculty, ophthalmologists and optometrists. Postgraduate qualifications in optometry were a prerequisite for appointment as academic or teaching staff at most universities offering a 4-year undergraduate degree in optometry. However, the absence of formal training in teaching and/or research among the faculty can limit ability and efficiency in terms of imparting knowledge and skills to the students in the optometry program. Traditional assessment methods were used in most colleges, which only assess theoretical knowledge rather than skills and competencies. The optometry profession requires clinical training and exposure. Although the Indian optometry curriculum includes hours of practical and clinical training, it was difficult to determine whether the colleges had the requisite infrastructure and teaching faculty to impart clinical training to students.

In all countries where the optometry profession is regulated and licensed, the curriculum is based on competency standard requirements with defined scope of practice and stringent entry and exit competencies that are cognizant of the health, safety and well-being of the public. Best practice suggests that a national regulatory body and framework could ensure harmonization and improved standards of education as well as eyecare delivery.

The study revealed that the diploma curriculum was insufficient in preparing practitioners to offer independent comprehensive optometric eye care, as defined by the WCO.

The differences in curricula of the degree and diploma syllabi necessitate defining scope of practice separately for diploma and degree holders in optometry in India. Skilled MLOP/technicians complement the services of ophthalmologists and can contribute to meeting the vision care needs of developing and developed countries.[22] The need for MLOP to be part of the ophthalmic workforce in a developing and populated country like India cannot be ignored. Lack of standardization of programs, disparate entry and exit competencies, poorly defined career paths and unequal scope of practice for optometrists and MLOP are a major cause for concern in India and other countries where the profession is unregulated.[19,22,23] The unethical and illegal practices of eye examinations and prescription of glasses by unqualified persons are major challenges in countries where the profession of optometry is unregulated and contribute to the public health issue of blindness.[24] Hence, the question arises: What is the best approach to balancing access to “some eye care” with quality and health considerations in countries such as India.

Based on the results of the study, a possible way to improve standards of care is to recognize diploma and degree holders as separate ophthalmic cadres and design and implement accredited uniform competency-based frameworks for the two cadres as well as define scope of practice for each cadre in order to ensure quality education and service delivery in India.

The institutions offering optometry have adopted the WCO’s Global Competency-Based Model Scope of Practice in Optometry and are producing optometrists who offer services at Level Two – optometry technicians (visual function services), Level Three – optometrists (ocular diagnostic services) and Level Four – optometrists (ocular therapeutic services).[9] In India, the curricula do not define the level for which graduates are prepared; therefore, the scope of practice of optometry needs to be defined, and education and training should be provided on the basis of this principle as in other countries. The optometry curriculum for the 4-year undergraduates in India does incorporate WCO curricular elements; however, lack of scope of optometry practice and an accreditation body creates optometrists with varying levels of education and training.

The results of this study indicated that not all colleges of optometry incorporate these elements in their curricula, suggesting the need for a uniform competency-based curriculum in the country. A socially responsive competency-based framework for ophthalmic technicians and optometrists should be developed in India in line with the one developed in Mozambique.[25] A socially responsive competency-based framework enables students to understand the eyecare needs of the community and be involved in community service, which are needed in a developing and populous country such as India. The success of a competency-based curriculum depends on educators’ use of appropriate tools to assess competency standards in students; hence, standardized checklists and rating skills to be used by educators need to be developed along with the curricula.[28]

Limitations of the study

It was difficult to determine whether the subjects in the curricula were being taught to their fullest scope of imparting requisite knowledge and skills, which was a limitation of this study. Though the optometry institutions included in the study tried to be as representative as possible, the unequal distribution of colleges across the country was a limitation that led to differences in the representation of colleges in each zone.

Conclusion

This study identified significant gaps between the diploma (2-year) and degree (4-year) optometry syllabi. Variations were evident in nomenclature, student intake and student assessment as well as entry and exit competencies among Indian optometry diploma and degree colleges. The diploma syllabus does not cover basic/enabling sciences in detail. It is largely based on ophthalmology because diploma holders were originally meant to provide support to ophthalmology and services under the supervision of ophthalmologists. The diploma curriculum is not at par with curricular elements suggested by WCO and does not prepare practitioners to independently deliver comprehensive optometry services. The optometry degree syllabus is at par with the curricular elements suggested by the WCO, which prepares practitioners to deliver comprehensive optometry services independently. However, the lack of entry and exit competencies in both diploma and degree programs results in an ill-defined scope of practice. There is no accreditation body for either the diploma or degree programs in the country. The study stresses the need for the harmonization of diploma and degree programs underpinned by the designing and implementation of a uniform competency-based framework for diploma and degree programs separately with a defined scope of practice and entry and exit competency standards. This would allow optimal utilization of available human resources, both diploma and degree holders, and ensure that the eye health of the public is protected given the burden of vision impairment in India.

Recommendations

Based on the results of the study, it is recommended that diploma and degree holders be recognized as separate cadres offering eye care to the public. Their scope of practice should be defined and an accreditation body should be developed to ensure implementation of the same.

Acknowledgements

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References

1. Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. Br J Ophthalmol. 2012 May;96(5):614-8. doi: 10.1136/bjophthalmol-2011-300539
2. Neena J, Rachel J, Praveen V, Murthy GV; Rapid Assessment of Avoidable Blindness India Study Group. Rapid assessment of avoidable blindness in India. PLoS One. 2008 Aug 6;3(8):e2867. doi: 10.1371/journal.pone.0002867
3. Resnikoff S, Pascolini D, Mariotti SP, Pokharel GP. Global magnitude of visual impairment caused by uncorrected refractive errors in 2004. Bull World Health Organ. 2008 Jan;86(1):63-70. doi: 10.2471/blt.07.041210
4. NPCBVI. National Blindness & Visual Impairment Survey India 2015-2019 – A summary report [Internet]. National Programme for Control of Blindness and Visual Impairment. 2019 [cited 2020Aug11]. Available from: https://npcbvi.mohfw.gov.in/writeReadData/mainlinkFile/File341.pdf
5. Eye care in India – a situation analysis. 2007 report prepared by Family Health and Development Research Service Foundation [Internet]. Boston, MA: Sightsavers International, India; [cited 2018 Apr 10]. Available from: https://www.sightsaversindia.in/wp-content/uploads/2019/03/16482_Eyecare-in-India-A-Situaltion-Analysis.pdf
6. Thomas R, Paul P, Rao GN, Muliyil JP, Mathai A. Present status of eye care in India. Surv Ophthalmol. 2005 Jan-Feb;50(1):85-101. doi: 10.1016/j.survophthal.2004.10.008
7. Palmer JJ, Chinanayi F, Gilbert A, et al. Trends and implications for achieving VISION 2020 human resources for eye health targets in 16 countries of sub-Saharan Africa by the year 2020. Hum Resour Health. 2014 Aug 15;12:45. doi: 10.1186/1478-4491-12-45
8. Global initiative for the elimination of avoidable blindness: action plan 2006-2011 [Internet]. World Health Organization 2007; c2021 [cited 2018 Oct 3]. Available from: https://apps.who.int/iris/handle/10665/43754
9. Resnikoff S, Lansingh VC, Washburn L, et al. Estimated number of ophthalmologists worldwide (International Council of Ophthalmology update): will we meet the needs? Br J Ophthalmol. 2020 Apr;104(4):588-592. doi: 10.1136/bjophthalmol-2019-314336
10. De Souza N, Cui Y, Looi S, et al. The role of optometrists in India: an integral part of an eye health team. Indian J Ophthalmol. 2012 Sep-Oct;60(5):401-5. doi: 10.4103/0301-4738.100534

11. Thite N, Jaggernath J, Chinanayi F, Bharadwaj S, Kunjeer G. Pattern of optometry practice and range of services in India. Optom Vis Sci. 2015 May;92(5):615-22. doi: 10.1097/OPX.0000000000000587
12. Anon. Organization and Institution News, Plan to boost Indian Optometry endorsed. Optom Vis Sci. 2010;87(12)
13. Kumar N. Role of optometrist in ophthalmic practice. Indian J Ophthalmol. 1976 Apr;24(1):41-2.
14. Grisham DJ, Jose RT. Optometry in India: 1969. Optom Vis Sci. 1970 Nov;47(11):928-937
15. Optometry Schools in India [Internet]. Tamil Nadu, India: India Vision Institute; c2015 [cited 2023 Aug 10]. Available from: https://www.indiavisioninstitute.org/resources-files/1004IVI%2--%20STATUS%20REPORT%20ON%20INDIAN%20OPTOMETRY%20SCHOOLS%202015.pdf
16. Enoch JM. The Elite School; 25 Years Later! & Optometry and its future in India. Hindsight [Internet]. 2010;41:79-91. https://www.mendeley.com/reference-manager/reader/04f0861f-cb03-3ea0-8377-29203cb70c16/04e0936e-6354-a-47-45e0-053f539ae08b
17. University Grants Commission. UGC (act 1956) and Rules & Regulations Under the Act [Internet]. University Grants Commission. 1985 [cited 2016May3]. Available from: https://www.ugc.ac.in/oldpdf/ugc_act.pdf.
18. Curricular Support Elements for an Optometry Programme [Internet]. World Council of Optometry. [cited 2022Aug.18]. https://worldcouncilofoptometry.info/wp-content/uploads/2020/08/curricular_support_element_final_web2.pdf
19. Prasad NM. Thoughts on establishing mid-level ophthalmic personnel for VISION 2020 in India. Community Eye Health [Internet]. 2005 [cited 2019Dec.15];18:112. https://www.cehjournal.org/article/thoughts-on-establishing-mid-l-vel-ophthalmic-personnel-for-vision-2020-in-india/
20. A Global Competency- Based Model of Scope of Practice in Optometry [Internet]. World Council of Optometry. 2015 [cited 2022Aug.18]. https://worldcouncilofoptometry.info/wp-content/uploads/2017/03/wco_global_competency_model_2015.pdf
21. Kunjeer G, Thite N, Gogate P, Jaggernath J. Adequacy and relevance of Indian optometry curricula to practicing optometrists. Clin Ophthalmol Res. 2016;4:127.
22. Bogunjoko TJ, Hassan AO, Okonkwo O, Akanbi T, Ulaikere M, Akinye A, Bogunjoko H, Lawal-Sebioniga MY. Impact of middle level eye care personnel on the delivery of eye care services in South-western Nigeria. Int J Community Med Public Health. 2018;5:871.
23. Awan H, Khan MD, Felch W, Spivey B, Taylor H, Resnikoff S, Gauthier T-M. Status of Ophthalmic Education and the Eye Health Workforce in South Asian Association for Regional Cooperation Countries. Asia Pac J Ophthalmol. 2014;3:74-82.
24. Rai M. Challenges of Optometry in SAARC. Acta Scientific Ophthalmology [Internet]. 2019;2. https://actascientific.com/ASOP/pdf/ASOP-02-0026.pdf
25. Shah K, Naidoo K, Loughman J. Development of socially responsive competency frameworks for ophthalmic technicians and optometrists in Mozambique. Clin Exp Optom. 2016;99:173-182.
26. Moodley V, Loughman J, Naidoo K. Social Accountability: Introducing a new dimension in optometric education. S Afr J High Educ. 2016;30.

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References: 1. In a 2-week prospective clinical study in the US; n=181; CLEAR CARE® Cleaning & Disinfecting Solution used for cleaning and disinfection; Alcon data on file, 2023. **2.** Zheng Y, Dou J, Wang Y, et al. Sustained release of a polymeric wetting agent from a silicone-hydrogel contact lens material. ACS Omega. 2022;7(33):29223-29230. doi: 10.1021/acsomega.2c03310. **3.** In a 28-day prospective clinical study;n=92; Alcon data on file, 2023.

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Malagasy Health Institutions Offering Clinical Practice to Norwegian Optometry Students: A Reflexive Qualitative Study of Staff Members Experiences

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Background

Madagascar, an island in the Indian Ocean, faces great challenges in providing proper health care for their population of approximately 30 million. Barriers to healthcare access include lack of infrastructure, lack of confidence in formal healthcare services, poor service quality, high costs, and low health literacy among the population. Frequently, the healthcare services are inadequately staffed, with outdated equipment and a lack of supplies.[1,2,3,4]. Eye care services are a low priority due to competing demands for health care funding.[4] Madagascar has two ophthalmologists per million population, and in total two optometrists and 60 allied ophthalmic personnel for a population of 29 million.[5] In contrast, Norway has 68 ophthalmologists per million population, and approximately 1,500 optometrists for a total population of five million.[6]

Norwegian optometry students' clinical practice in Madagascar is contextualized against the backdrop of these healthcare challenges. The University of South-Eastern Norway (USN) is the only university in Norway offering bachelor, master, and PhD degrees in optometry. The bachelor students in Norway receive an international acknowledged degree upon graduation. The international perspective is brought to students both from external lecturers, study literature and exchange options abroad. An elective clinical course offers students a unique opportunity to travel abroad and participate in providing eye-health care services to local communities. During this experience, students are supervised by local clinical staff and are supported by interpreters who facilitate communication between the students and patients, Additionally, students benefit from the mentorship of non-governmental organization (NGO) mentors and USN supervisor. USN has since 2007 collaborated with a NGO in Madagascar, Lovasoa Cross Cultural Center (Lovasoa 4C). Since 2016, USN in collaboration with Lovasoa 4C, facilitates 12 weeks of practical clinical experience for final year Norwegian optometry students in several local health institutions. Prior to clinical practice the students conduct a language and culture course at Lovasoa 4C.

The Norwegian government views internationalization as a vital avenue for future Norwegian workers to gain indispensable skills in an increasingly global, multicultural, and digital society. In line with this perspective, the Norwegian government endorses the strategic goal of having 50% of Norwegian students to stay abroad upon graduation.[7] There is an increasing number of health students from universities in high-income countries travelling to low-income countries to undertake international clinical placement. A growing number of studies found numerous positive outcomes for these students. These benefits include increased cross-cultural competence, personal and professional growth, and enhanced communication skills.[8,9,10,11] However, the literature tends to overlook the perspective of host institutions. Several authors have raised concerns regarding the safety, appropriateness, and ethics of student activities abroad, particularly in medical programs during international health electives in the global south.[12,13,14,15] Nonetheless, there is a noticeable gap in the existing literature as there are no studies specifically focused on the internship experiences of optometry students in the global south. The primary objective of this study is to investigate the expectations, experiences, challenges, and implications associated with hosting undergraduate optometry students from the perspective of the receiving institutions.

Methods

Study Design and Data Collection

This study has a qualitative descriptive approach using reflexive thematic analysis.[16,17] We sought to get a broad analytic scope by allowing the potential for the development of innovative themes. We used focus group interviews to create data or insights that would be difficult to produce without the dynamics of the group. This article is written and follows the COnsolidated criteria for REporting Qualitative research (COREQ).[18]

Data Collection

Data was collected once at two main institutions receiving Norwegian optometry students for several years: an ophthalmic

ward (OW) located in a mainland hospital and a general health center (GHC) supplying supplementary eye health care in an eastern coastal town.

The OW is a multidisciplinary clinic, staffed with three ophthalmologists, two refractionists, several nurses and eye health assistants. The OW engages in eye health care from out-reaches in villages to advanced surgery. Some of the staff members have professional English knowledge. The GHC lack eye-care personnel on a permanent basis. There is an optometric assistant present with limited English knowledge, who is trained through national courses and by Norwegian optometry students. This person provides simple refraction and spectacles. Staff consists of the director and two administrative personnel involved when optometry students attend GHC.

Both institutions were asked to participate in focus group interviews involving staff members who were involved, in one way or another, with Norwegian optometry students. A convenient time and place for focus group interviews was agreed in advance. Each staff member (informant) was informed orally and written (in Malagasy language) about the nature and purpose of the study. The informants were all above 18 years of age and signed informed consent.

The staff members were interviewed using semi-structured interviews. One focus group per institution was formed, one with one female and one male, another with three males only. The staff members attending the interviews had either administrative or clinical responsibilities for the students. The first interview was conducted in English by SN while ZT translated to Malagasy. SN is a Norwegian nurse who has lived 5 years in Madagascar and other African countries for several years. SN is experienced in receiving and providing administrative support for students travelling abroad. ZT is from Madagascar, has worked 10 years in Asia, and at Lovasoa 4C with Norwegian students for 5 years. The second interview was conducted by ZT in Malagasy and translated to English by ZT. Interviews (93 minutes and 53 minutes) were recorded and transcribed by ZT.

Analysis

We conducted a qualitative reflexive thematic analysis (RTA)[19] of the interviews. The interpretation and coding of the interviews was carried out by SN, RA, IL and ZT. Microsoft Excel was used to manage the data. RA is a Norwegian optometrist, with experiences from clinical practice in Madagascar both as a student and twice as clinical supervisor for Norwegian optometry students. IL is an optometrist and associate professor at USN, project manager and responsible for sending optometry students abroad, since 1997. IL has lived 2 years in England and one in USA and has visited Madagascar once. All researchers possess multilingual and multicultural backgrounds and are conscious of their own assumptions while conducting RTA. Throughout the process, cultural and linguistic differences were frequently discussed.

RTA is individual native reading of the text, development of codes, subthemes, and overarching themes. We followed the process of RTAs as proposed by Braun and Clarke.[19] As the first step, the researchers read and re-read the transcripts to gain familiarity with the data material. The researchers aimed to limit misinterpretation through discussions of understanding the text with ZT.

The meaning of the text, data item, was discussed and agreed upon by researchers. The code labels are the first phase in identifying segments of text, identified as interesting, relevant and meaningful.[19] The code phase is the more latent step to develop candidate themes. The authors reflected between each step, to ensure that meaningful interpretation was conducted. The main themes were defined after a dynamic process of analysis. **Table 1** presents the process of interpretation on how Malagasy staff members describe students' traits and their role guiding students beyond health professional responsibilities. Informants were not a part of the analysis team.

Table 1. Example of analysis process from meaning in text to main theme.

Data item	Code labels	Code	Candidate theme	Main theme
They (students) don't limit themselves by not having that material and then stop the consultation, but they always try to overcome that and then still do the consultation and give the patient the satisfaction of their help and find solution for that anyway.	**Students use available resources to do an eye examination**	**Attitude to local equipment**	**Patient care with available resources**	**Students' traits**
And if the Norwegian students try to build a relationship with them (patients) then it will ease the cooperation and the relationship. Because the Malagasy people, it is not that they don't like to have contact, but they are just afraid. Just a simple way of greeting, you can just say "akory aby e". That is a key point to just build right away a relationship with the people.	**Student is taught by staff to greet the patient is important in relation to patients' pre-assumptions**	**Building trust through culture awareness**	**More than a professional**	**Role perception**

Table 1. *Example of analysis process from meaning in text to main theme. Click to enlarge*

Ethics

All participants were informed orally and in writing about the project's aim. The informants were all above 18 years of age and signed the consent form. They were also informed that the information would be used to improve exchanges of students and the daily activities of the staff members as students were present. The study was approved by the Norwegian Agency for Shared Services in Education and Research, ref.nr. 592193.

Results

Three main themes **(Table 2)** emerged from the analysis: Role perception, Challenges and Opportunity awareness.

Table 2: Overview of main themes and sub-themes.

Role perception	Challenges	Opportunity awareness
• More than a professional. • Students' traits	• Language and sociocultural barriers • Unclear expectations • Lack of continuation	• Development of quality and knowledge • Development of language competence

Table 2. *Overview of main themes and sub-themes. Click to enlarge*

Role Perception

Role perception refers to how the informants define their role. This concept includes two sub-themes: More Than a Professional and Students' Traits.

More Than a Professional: All informants from both institutions seem to take responsibility, in various ways, for involving the students in work tasks and integrating them into the colleague group. These roles appear to have been clearly outlined among the staff before the students' arrival. Both administrators and directors play crucial roles in introducing the students to clinic staff, facilitating their practice, and even serving as translators when needed. They stress the importance of ensuring that students receive proper introductions:

> *"When the students arrive here, we usually introduce them to the whole staff in order to know who those students are and where they are from. And what are they going to do here". (i1)*

Those in close contact with the students include the refractionists at OW and the trained worker at GHC. They work alongside the students daily, providing instructions on tasks within the practice place. These individuals play an important role in training the students in routines and the use of clinical instruments. Following initial guidance, they allow the students to try tasks independently, promoting a sense of autonomy.

> *"There are times, we give them a patient and let them treat him from the beginning, and they [the students] really start from the beginning [and do] all the steps according to theory […] We let them free to do it, but we are there next to them to assist in any case." (i1)*

The informants emphasize several times that the students should take the first initiative to greet the patients. Especially the informants from the GHC stress that an important element for establishing contact is that the students take the first step and that they greet people first.

> *"And if the Norwegian students try to build a relationship with them then it will ease the cooperation and the relationship. Because the Malagasy people, it is not that they don't like to have contact, but they are just afraid. Just a simple way of greeting, you can just say "akory aby e". That is a key point to just build right away a relationship with the people." (i4)*

Although the staff are not formally trained optometrists nor trained educators, they express mastering the field of assessing the students' learning and performance:

> *"I personally can say that they know. It [optometry] is something that we do not master, but talking to them, you can hear that they know what they are doing." (i4)*

The trained worker at GHC says that he feels he can measure the students just from looking on the satisfaction of the patient:

> *"that if the patient were satisfied about the consultation and the result then it means that I can measure their knowledge that they master their profession." (i5)*

The informants' narratives indicate that they all do what is in their power to help the students thrive, also to the extent outside the professional space. At the OW, they arrange morning prayer every day and students, staff and patients are invited to join. Although the sharing is in Malagasy, the students join regularly. The way the informants include the students is emerging in the following comment from the director:

> *"Sometimes there are some texts of the songs that are easy to translate then… for example the song number 440. Then I tried to translate the song for them. And I can see that they are happy when I do that. And as I2 said, we give them the song book and they are also trying to follow the song in Malagasy." (i1)*

Some of the informants from the OW do also take part in students' life outside the clinic, facilitating the students stay in a new country:

> *"There was a time we brought them to the local market, I and X, we brought them to the Saturday market and the students were happy. They said they wanted to buy something, and they asked us. So, when they need something, they ask us without hesitation." (i2)*

The informants serve as cultural interpreters and local guides. Due to language, it appears easier for the OW staff to take part in students' social life compared to the staff from GHC who have more problems communicating directly with the students

when the translator is not there. Thus, the informants are not merely professionals' advisors and helpers; they wear a variety of hats to make the students feel welcome and included.

Students' Traits: Student traits refer to crucial characteristics of students, as identified by the host, that are deemed essential for a successful internship experience. The informants frequently highlight the students' attitudes as important for the success of the internship program, often describing them as respectful, hardworking, and friendly. Despite language barriers the informants find that the students still managed to build relationships with the clients. The students attitude contributes to this:

> *"They are really good at welcoming the patients […]and they are good at making them feel comfortable." (i2)*

While the informants express concern about the equipment, they also note that the students effectively cope with the available resources:

> *"They always come and use what we have here. They don't limit themselves by not having the material or stop the consultation. They always try to overcome that and then still do the consultation and give the patient satisfactory help and find solution for that anyway. Without the equipment." (i4)*

The informants emphasise the importance of the students' taking initiative, showing interest and being sociable. At the OW, the students' attendance in the morning prayer is appreciated, and shows the staff that the students want to take part and want to build relations with them as workers:

> *"It is even kind of natural for them. when they arrive at the same time as us and they attend the Morning devotion with us. And when we pray, they are there to listen and to observe. And sometimes when the cult is finished, they ask what the song was and then we sing it again." (i2)*

Challenges

Although the informants perceive receiving students as mainly a positive experience, their feedback in the interviews reveals some of the challenges they experienced. They highlight challenges linked mainly to language and sociocultural barriers, unclear expectations and lack of continuation.

Language and Sociocultural Barriers: The informants consider language competence to be vital for the students to fully derive benefits from the internship. They identify the language barrier as a significant challenge. Interestingly, the concern about language is predominantly associated with interactions between students and patients rather than between the informants and the students. According to the informants, students can handle simple questions and basic testing, but when it comes to patients describing their problems or the students explaining something, language barriers impede effective communication. I2 gives specific suggestions on what could help facilitating communication:

> *"I think they should have more vocabulary in the refraction. Some more vocabularies regarding refraction and the eyes, as the vocabularies are repeating in that field, and it will always be the same even in Malagasy." (i2)*

The informants at the CHG mention that it is a challenge that the students only learn the dialect of the city where the students do the language course. They suggest that the students should learn some words and phrases from the coastal area before they start their internship there.

The informants report that most patients have high respect towards the Norwegian students as they relate it to quality. However, the informants find that sometimes the communication barriers may cause frustration for the patients, so the staff feel they need to intervene:

> *'If for example the student explains two or three times the same thing and the patient still doesn't understand it, at that point we have to find another person to intervene and help so that the patient will not close up and*

> *then will not open up anymore." (i4)*

When asked why they think the patient 'close-up', one of the informants says that he believes it might be due to the low health literacy among people and the fear from the patient's side of appearing 'stupid'. They suggest that in addition to increasing the hours of language training before starting the students should also be more informed about context and culture, such as the issue of health literacy. The OW being a Christian clinic is also mentioned by the director to be something the students should know about without elaborating any problems related to it:

> *"It is good that they know it belongs to the Malagasy Lutheran church and that this should not be an obstacle from coming here." (i1)*

In addition, the informants highlight that the students should learn something about the difference in culture between the two different areas in which they do their practice:

> *"In the Highland, if you do not know each other you're not forced to talk to each other. But here at the East Coast, if you see people then the students must be the first to say "akory aby". It has an important impact to the patient, the first step that the students are doing with them. That is one of the cultural differences between the coast and the Highland." (i5)*

The use of a translator was also discussed among the informants. The professionals at the GHC appreciated that the students had a translator every day as none of their staff are fluent in English, while at the OW they saw some of the challenges of having a translator:

> *"I think it is not so good to have a translator. It is not necessary, and it is even more difficult to handle if there is the patient, the translator and then the student. I think that will even delay the work and that as I said it is not that necessary." (i2)*

Unclear Expectations: Although the informant narratives suggest that they feel that their role in relation to the students is clear to them, they say that they are not well informed about the students' learning goals:

> *"If you are not an expert in that field it is hard to judge their level, and secondly if there were a definition in advance of the learning outcomes then it might be easier for us to measure accordingly." (i1)*

Informants from both institutions highlight the issue of insufficient or outdated equipment, which adds to the challenges arising from unclear expectations and becomes a source of concern. They express worry about whether students can effectively meet the university's learning goals when faced with a shortage of essential equipment in their respective clinics.

> *"For us in our everyday work, we have some tools, but it is not sufficient. It seems the students must do some practice with low vision as optometrists, but we do not have tools for that. We don't know if we are the ones who do not help them, or they are the ones who do not say that they should do that practice and that their practice might not be enough. For instance, there is need of this test but here we just have this [test]…. I am still wondering if that is part of the university expectation or not?" (i1)*

Implicitly, the informants are suggesting a need for equipment, believing that providing it would enhance the students' practical experience:

> *"So, if they could add some of those tools so that they can really exercise well with those materials. Because*

> *they can really do a lot of those practices with the patients that are coming here every day." (i2)*

In both institutions, there appears to be uncertainty surrounding the students' time schedules. Informants at the GHC explain that there are instances when students commit to coming in the afternoon but fail to show up. They observe an increase in patient visits to the clinic when Norwegian students are present. Consequently, on the afternoon when the students did not arrive as scheduled, numerous patients were left waiting without receiving consultations from them.

The informants express that there is a lack of evaluation and feedback at the end of the students' stay. They say that it would be useful to have some sort of evaluation to improve:

> *"We also want to know at the end of their stay here, how they experienced it. In general, they are always thankful, and we can see that they are happy, but we want to know more about their stay here. If there were things we could improve, what was missing?" (i2)*

Lack of Continuation: The optometry students stay in Madagascar for 3 months every year, normally from January to April. Then they leave and a new group of students will arrive again next year. Accordingly, the informants find that there is a lack of continuity when the students leave:

> *"When the students are here, everything is fine. When they leave, then it seems that everything goes with them, and it doesn't continue. Then when the others [the next student group] come, the thing is starting again." (i1)*

The disruption relates to the specific procedures the students do at the clinic as optometrists, and to specific equipment that the students often bring where it seems that the staff at the clinics don't use the equipment given by the students when the students are not around:

> *"The solution to it is that, at least, if they want to leave something for us, then they should show to the workers here the procedure of Optometry and how to use those tools." (i1)*

The informants say that a solution would be that if the students train the workers, the workers can continue to use knowledge and equipment of optometry for their patients even when the students are not there. In addition, when a new group of students arrive, the workers can share their experience.

Opportunity Awareness

Opportunity awareness refers to the perceived possibilities that arise through the mobility program. Opportunity awareness includes two sub-themes: development of quality and knowledge sharing and development of language competence.

When asked how it has been for them to receive Norwegian students, all informants start their reply by saying something positive such as;

> *"For us, we do not have any problem" (i1) or "The cooperation with them has always been good "(i4).*

When they elaborate on this, they focus on the opportunities that arise because of the exchange.

Development of Quality and Knowledge: Although there are narratives indicating that some of the patients, especially the children, may be a bit afraid of the foreigners, the informants say that most people link Norwegian students with quality. The informants from the GHC report that they see that when the Norwegian students are there, they do have more patients coming than normal.

> *"When we say there will be consultation from Norwegian students, we always receive many patients. This means that people here consider always that it will be…they expect high quality of things when it comes to Norwegian students." (i5)*
>
> *"The fact that they see the person is white, they already have this trust that the service quality is higher. Yes, the patient thinks that the quality of the service will be higher." (i4)*

The informants acknowledge and value the optometry expertise that the students bring with them, recognizing its significance for their clinics. This appreciation is expressed in various ways, with the director of the OW seeing the arrival of Norwegian students not only as an opportunity to build competence and establish meaningful relationships, but also as a means to achieve a larger goal:

> *"There is not much optometry in Madagascar. There is a promotion in the ministry in Madagascar. And what we have experienced till now is that it is really helping us because in our eye-clinic, there is the refraction service. And the refraction service has a big link with optometry. That's why we say that it is good to have them to improve. And the advantage of having them is that there is an exchange and a relationship. But as a goal it would be nice to have an optometry service here after some years." (i1)*

At both institutions, the competence and quality that Norwegian students bring are recognized. Since the GHC has fewer human resources compared to the OW, establishing their own optometry service is deemed unrealistic. Nonetheless, the students contribute significantly through capacity-building activities, particularly in training clinic staff. This is considered a crucial endeavor for both clinic improvement and reputation enhancement. The trained worker emphasizes the valuable learning experience gained from the students:

> *"I didn't know how to use the equipment for optometry before, only the glass. But when they arrived, they gave me a little book and then they taught me when they were here. They trained me on how to receive people and how to do with people even with the glass. And then I go deepen in that book. And I can say from the month of May until now I have received around 120 people." (i3)*

The new equipment is used by the students and enables the students to conduct a variety of activities in the clinic. However, the informants express that there is a need for more equipment.

> *"It could be set as a goal that in three or four years from now, being optometry student in Madagascar will not be difficult for those who are coming here. That we start slowly to have the needed equipment about it so that it is not going to be difficult for the others anymore.[..]" (i1)*

Development of Language Competence: The informants see it as a value that by receiving students, they get the opportunity to improve their own language competence. That is specifically mentioned by the OW. While they say that language is a major obstacle for the students to be able to work independently, they perceive it as a possibility for themselves:

> *"It is also advantageous for us that they are not so good in Malagasy. Then we can also improve our English vocabulary." (i1)*

Discussion

The primary objective of this study is to investigate the expectations, experiences, challenges and implications associated with hosting undergraduate bachelor optometry students from the perspective of the receiving institutions. To our knowledge, ours is the first research to focus on host perceptions in the global south regarding receiving Nordic optometry students.

The Respectful Relationship

Our results indicate a dedicated effort by staff at both clinics to ensure the inclusion and well-being of the students. The staff willingly take on diverse roles, serving as translators, mentors, guides, professionals and intercultural interpreters, even though these responsibilities are not explicitly assigned. While other studies report how time-consuming it is to follow up on foreign students,[13,20,21] the informants in our study do not report similar feelings. In addition, the informants portray the optometry students mainly in positive terms, describing them as respectful, empathic, positive and serious. This positive impression stands in contrast to other studies that have reported negative traits among students such as inflexibility, apathy in clinical care and the attitude of being 'medical tourists'.[13,22] The systematic review conducted by Lu et al.,[14] encompassing the experiences of nearly 400 hosts across 25 Low-and Middle-Income Countries (LMICs) hosting mostly medical students from high-income countries (HICs), highlighted instances of power dynamics stemming from racial differences, including feelings of discrimination and disrespect among host clinicians in some studies.[13,20,23] The reasons for these different findings may be manifold. The absence of negative traits reported by our informants could be in part due to the mandatory pre-departure training and weekly coaching sessions undergone by the students in our study context. Such training is recognized as effective in preventing ethical issues during internships in low-resource settings.[8] The divergence could also be attributed to the perception of optometry students in our context as valuable resources rather than burdensome responsibilities.

Whatever the reason for these differences in findings, we believe that the foundation for healthy relationships between the students and local staff lies in the respectful attitude demonstrated by both parties. The informants actively involve the students in various work tasks, fostering a sense of collegial fellowship and encouraging independence with support when needed. Students are invited to join field trips and participate in social gatherings, including prayer services. In reciprocation, the students demonstrate interest in the patients, staff and local context by asking questions about language and culture, and they approach their work with seriousness. The participation of students in events like prayer services is seen by staff and patients as contributing to a sense of unity. This dynamic creates a reciprocal cycle of mutual engagement and understanding.

While the lack of language competence posed challenges in student-patient communication, it created opportunities for communication between students and staff. This is in line with previous research on host perceptions in a low-income setting with foreign midwifery students and medical electives.[21,24] In our study, students search for assistance from staff when faced with language barriers and utilized occasions like morning prayers to request help with language. The observed close relationship between students and staff was particularly evident at the OW. In contrast, at the GHC, the presence of a translator was frequent, potentially acting as a barrier to developing close relationships. However, while the staff at OW viewed the language situation as advantageous for improving their English proficiency, it does not negate the need for additional language training for the students. The informants underscored that students should acquire more vocabulary, particularly related to the field of optometry, to enhance their ability to communicate effectively with patients and work more independently.

Common Meeting Places, Formal Agreements and Collaborations

While the informants express confidence in their roles regarding the students, they revealed critical gaps in regards of information flow, such as the students' learning goals and schedules. Informants were also concerned about their institution's equipment to support students towards their learning objectives. This is in line with other research where hosts report unclear goals and objectives for short-term medical students, emphasizing a common challenge of inadequate communication between partners involved in student mobility.[14] The same review found that many host institutions struggle with inadequate mechanisms to provide feedback on visitors to sending institutions.[14] In Kumwenda et al.'s study,[13] informants suggested that better organization of students occurred when tutors from sending institutions established links with the host site. Establishing direct contact between the sending institution and the receiving institution appears crucial, not only relying on a facilitating partner. We propose that to enhance information flow, there should be regular meetings, preferably physical but at least online, between the responsible individuals from the host institution, the university and (in our context) the local facilitator. These meetings should occur before the students' arrival, midway through their stay, and at the end of the program to ensure the sharing of information regarding goals, schedules, expectations and feedback. Although this approach may be time-consuming, it is likely to be more sustainable in the long run, contributing to the maintenance of motivation and proficiency among all participants.

There is a lack of empirical studies describing what hosts in low-income countries gain by receiving students. While student participants often report positive experiences, only a limited number of programs establish mechanisms that ensure sustained, ongoing benefits for the institutions involved.[25] McMahon et al.[21] found that receiving international medical students had a positive effect on the prestige of the host institution in the eyes of the local community which is similar to our findings. In addition, some of the informants in our study mention that they have been trained by optometry students, and the institutions have also received some equipment from them. However, there is a lack of formalized or long-term planning involved in both

the training and equipment provided by the students for the clinic. The informants are explicit about the untapped potential for them to gain even more from receiving international students, indicating that certain opportunities for mutual learning and development of their institutions remain unrealized. In Lu et al.'s study,[14] the informants emphasize the need for more long-term sustainable programs that include capacity building for host institutions and individuals. Ouma and Dimaras[26] suggest a more equal partnership in the design phase and through relevant preparation or reciprocal support, such as staff training opportunities. A formalized agreement between the university and the host institutions would be useful to optimize the possibilities within international cooperation and student exchange.

Awareness of Underlying Attitudes

Simultaneously, we wonder why staff members did not seek more information about students' goals or schedules, when students were present. The hesitancy of informants to request additional information may be attributed to issues of culture, lack of time or power dynamics, white privilege or ethical concerns identified in previous research within contexts with a colonial legacy.[27] In addition, instances where students commit to coming in the afternoon, but fail to show up without notice, could be perceived as a manifestation of white privilege. This suggests that despite staff descriptions of students as respectful and friendly, an underlying attitude of not being accountable to anyone may exist among the students. Such behavior would be unacceptable in a Norwegian setting, where students are expected to be present at the designated practice place on time. Both sending institutions and students should be cognizant of these dynamics. Although conversations on these topics may pose challenges, it is crucial to acknowledge that factors such as skin color play significant roles in determining power and status, with being white often conferring advantages. Our study illustrates this as well through patients associating whiteness with quality. As a proactive measure, we propose the integration of discussions about power and privilege into pre-departure training for low-income countries.

Limitations

We consider it to be a strength that all authors have been involved in student exchange to Madagascar for many years and are familiar with the field and the context in which the study has been done. Recognizing potential challenges related to cultural dynamics and power imbalances, particularly concerns about informant openness during interviews, the presence of one Malagasy author, ZT, played a crucial role in establishing a trustworthy environment. This facilitated attendees to express honest feelings, experiences and future thoughts.

Despite language barriers, the careful interpretation of interview meanings is asserted through discussions and analysis presented in this article. Language barriers have been present during the process of transcription and translation, and might have influenced the findings, but when quotations have been unclear, authors have consulted ZT.

Due to the small sample size, the findings of this study cannot be generalized. However, the richness of data material obtained through these focus group interviews adds to the study's credibility. As a result, we believe there is potential for the findings to be transferable to similar contexts. It is also a strength of the study that the analysis of the data was a long-term continuous process with thorough discussions between the authors.

Conclusion

Our study reveals the importance of clear communication between involved institutions. Conducting meetings, either in person or through available online platforms, is imperative to facilitate the exchange of information regarding goals, schedules, expectations and evaluation. One of our recommendations is the implementation of a predeparture compulsory in depth language- and culture course for outbound students. This course should encompass specific terms related to their field of practice, customized to the local context, and include elements of cross-cultural communication and perspectives on power imbalances. We underscore the value of reciprocity and recommend establishing formalized agreements to incorporate mutual long-term goals. For future research, we recommend exploring further the experience of host institutions receiving international health care students.

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References

1. Favero R, Dentinger CM, Rakotovao JP, et al. Experiences and perceptions of care-seeking for febrile illness among caregivers, pregnant women, and health providers in eight districts of Madagascar. Malar J. 2022 Jul 7;21(1), 212. doi: 10.1186/s12936-022-04190-x
2. Harimbola DR, Mizumoto K. Individual and Household Risk Factors for Severe Acute Malnutrition among Under-Five Children in the Analamanga Region, Madagascar. Int J MCH AIDS. 2018;7(1), 217–225. doi: 10.21106/ijma.248
3. Marks F, Rabehanta N, Baker S, et al. A Way Forward for Healthcare in Madagascar? Clin Infect Dis. 2016 Mar 15;62 Suppl 1, S76-79. doi: 10.1093/cid/civ758
4. Randrianaivo JB, Anholt RM, Tendrisoa DL, Margiano NJ, Courtright P, Lewallen S. Blindness and Cataract Surgical Services in Atsinanana Region, Madagascar. Middle East Afr J Ophthalmol. 2014 Apr-Jun;21(2), 153–157. doi: 10.4103/0974-9233.129767
5. Country Map and estimates of vision loss – Madagascar [Internet]. London: The international Agency for the Prevention of Blindness [cited 2025 January 5]. Available from: https://www.iapb.org/learn/vision-atlas/magnitude-a-d-projections/countries/madagascar/
6. Country Map and estimates of vision loss – Norway [Internet]. London: The international Agency for the Prevention of Blindness [cited 2025 January 5]. Available from:https://www.iapb.org/learn/vision-atlas/magnitude-a-d-projections/countries/norway/
7. St. 7 (2020–2021). (2020). En verden av muligheter—Internasjonal studentmobilitet i høyere utdanning. Kunnskapsdepartementet. https://www.regjeringen.no/no/dokumenter/meld.-st.-7-20202021/id2779627/
8. Greaker TK, Grudt SK, Aune I. Norwegian nursing students' experience during clinical placement in an African country: Communication, relationship building and nursing identity. A qualitative study. Nurs Open. 2023 Mar;10(3), 1803–1810. doi: 10.1002/nop2.1440
9. Hovland OJ, Johannessen B. Sykepleierstudenter utvikler kulturell kompetanse på utveksling i Tanzania. Sykepleien Forskning. 2018;73782, e-73782. doi: 10.4220/Sykepleienf.2018.73782
10. Jeffrey J, Dumont RA, Kim GY, Kuo, T. Effects of international health electives on medical student learning and career choice: Results of a systematic literature review. Fam Med. 2011 Jan;43(1), 21–28.
11. Ulvund I, Dadi GB, Sundal H. (). Nurses benefit from international clinical placement as nurse students: A qualitative study. Nurse Educ Today. 2023 Feb;121, 105663. doi: 10.1016/j.nedt.2022.105663
12. Kolars JC, Cahill K, Donkor P, et al. Perspective: Partnering for medical education in Sub-Saharan Africa: seeking the evidence for effective collaborations. Acad Med. 2012 Feb;87(2), 216–220. doi: 10.1097/ACM.0b013e31823ede39
13. Kumwenda B, Dowell J, Daniels K, Merrylees N. Medical electives in sub-Saharan Africa: A host perspective. Med Educ. 2015 Jun;49(6), 623–633. doi: 10.1111/medu.12727
14. Lu PM, Mansour R, Qiu MK, Biraro IA, Rabin TL. Low- and Middle-Income Country Host Perceptions of Short-Term Experiences in Global Health: A Systematic Review. Acad Med. 2021 Mar 1;96(3), 460. doi: 10.1097/ACM.0000000000003867
15. McCarthy AE, Petrosoniak A, Varpio L. The complex relationships involved in global health: A qualitative description. BMC Med Educ. 2013 Oct;13, 136. doi: 10.1186/1472-6920-13-136
16. Braun V. Thematic Analysis: a practical guide. London: SAGE; 2022.
17. Byrne D. A worked example of Braun and Clarke's approach to reflexive thematic analysis. Quality & Quantity. 2022;56(3), 1391–1412. doi: 10.1007/s11135-021-01182-y
18. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007 Dec;19(6), 349–357. doi: 10.1093/intqhc/mzm042
19. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006 Jan;3(2), 77–101. doi: 10.1191/1478088706qp063oa
20. Keating EM, Haq H, Rees CA, et al. Reciprocity? International Preceptors' Perceptions of Global Health Elective Learners at African Sites. Ann Glob Health. 2019 Mar 15;85(1), 37. doi: 10.5334/aogh.2342
21. McMahon D, Shrestha R, Karmacharya B, Shrestha S, Koju R. The international medical elective in Nepal: Perspectives from local patients, host physicians and visiting students. Int J Med Educ. 2019 Nov 22;10, 216–222. doi: 10.5116/ijme.5dc3.1e92
22. Rees C, Keating E, Lukolyo H, et al. Host clinical preceptors' perceptions of professionalism among learners completing global health electives. Int J Med Educ. 2018 Jul 27;9, 206–212. doi: 10.5116/ijme.5b40.6e4b
23. Lukolyo H, Rees CA, Keating EM, et al. Perceptions and Expectations of Host Country Preceptors of Short-Term Learners at Four Clinical Sites in Sub-Saharan Africa. Acad Pediatr. 2016 May-Jun;16(4), 387–393. doi: 10.1016/j.acap.2015.11.002
24. Bull MA, Geraghty DS, Dube MM, et al. Facilitating midwifery students on an international placement: Clinical facilitator perspectives. Nurse Educ Pract. 2020 Oct;48, 102869. doi: 10.1016/j.nepr.2020.102869

25. Hegwood M. A Critical Reflection on the Role of Power and Privilege in Conducting International Development Research. Purdue J Serv Learn Int Engagement. 2020 Jan;7(1). doi: 10.5703/1288284317234
26. Ouma BD, Dimaras H. Views from the global south: Exploring how student volunteers from the global north can achieve sustainable impact in global health. Global Health. 2013 Jul 26;9(1), 32. doi: 10.1186/1744-8603-9-32
27. Renaud-Roy E, Bernier N, Fournier P. Host perspective on academic supervision, health care provision and institutional partnership during short-term electives in global health. Med Educ. 2020 Apr;54(4), 303–311. doi: 10.1111/medu.14027
28. Kim J, Olaiya MT, De Silva DA, et al. Global stroke statistics 2023: Availability of reperfusion services around the world. Int J 2024;17474930231210448. doi: 10.1177/17474930231210448

International Education – Broadening Our Vision

Timothy Wingert, OD, FAAO, Guest Editor | Optometric Education: Volume 50 Number 2 (Winter/Spring 2025)

Numerous authors have discussed the benefits of international education. They have noted its impact on student's cultural understanding, comprehending of public health issues, diversifying clinical education, and solidifying basic concepts in providing optometric care. Faculty members participating also have a broadened view of the world and experience new approaches that they may incorporate into their normal instructional activities.

Timothy Wingert, OD, FAAO

In October 2019, the Association of Schools and Colleges of Optometry (ASCO), the American Academy of Optometry (AAO), and the World Council of Optometry (WCO) jointly put on a global summit on optometric education. In attendance were representatives from each of these organizations, including individual representation from the six regions of the WCO. The Summit had three goals:

> ***Goal 1:*** *To assemble representatives from optometric academic institutions around the world and identify issues facing optometric education globally.*
>
> ***Goal 2:*** *Share current best practices in optometric education.*
>
> ***Goal 3:*** *Share ideas on future developments in optometric education.*

After 4 hours of discussion, one of the conclusions arrived at was that many of the issues in optometric education are not isolated to one country or geographic region, they are shared by institutions around the world. In the spirit of advancing optometric education globally, ASCO printed a report from the Summit[1] and has put forth these two theme issues of *Optometric Education* that is entirely related to international optometric education. The intent was to highlight some of the activities going on around the world and to report the results of research within optometric educational institutions outside of North America.

As you will see from the diversity of articles in this issue, there are many organizations involved in international optometric education and in furthering the optometric profession around the world. We hope these articles will allow readers to better understand some of those perspectives and contributions and hopefully inspire efforts of collaboration. Perhaps this issue will inspire readers to reach out to others involved in similar efforts and not work within silos but instead find ways to form partnerships that provide synergy to what they do.

1. Vitek MA, Wingert TA. Special Report: Results of an Optometric Education Global Summit, Optometric Education. 2002 Nov; 48(1).

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The Benefits of International Educational Collaboration in Optometry – An overview of the discussion at the 2022 Annual ASCO International Educators in Optometry's SIG meeting

Meng Meng Xu, OD, FAAO, John H. Nishimoto OD, MBA, FAAO | Optometric Education: Volume 50 Number 2 (Winter/Spring 2025)

In November 2022, the ASCO International Optometric Educator's SIG cohosted an annual meeting in San Diego with VOSH/International. Besides ASCO institutions, VOSH/International also invited faculty advisers from their chapters in Latin American and the Caribbean (LAC) and the African continent. This diverse cohort allowed for a very rich discussion on the benefits of fostering more international collaborations among optometry educational institutions. An overview of the discussion and next steps from this meeting is shared in this report.

ASCO promotes the worldwide advancement of optometric education including professional degree programs, dissemination of academic materials, and continuing education through our International Optometric Education (IOE) Committee and International Optometric Educators Special Interest Group (SIG)[1]. The IOE SIG meets annually to maintain a continuum of ongoing programmatic activity and projects to support the development and advancement of optometry and its academic and clinical programs worldwide. The SIG members are faculties who manage or teach international optometric programs in their respective ASCO institutions.

In November 2022, the IOE SIG cohosted an annual meeting in San Diego with VOSH/International as many faculty working in ASCO institutions were also faculty advisers of the student VOSH chapters (SVOSH) within those schools. Besides ASCO institutions, VOSH/International also invited faculty advisers from their chapters in LAC and the African continent. This diverse cohort allowed for a very rich discussion on how to foster more international collaborations among optometry educational institutions.

In the past decades, global health has seen a paradigm shift of emphasizing equal South-North partnerships rather than unilateral "aid" being delivered from one country to another.[2,3] To be in line with this standard, the discussion at this SIG meeting focused on how international collaboration could be a win-win situation for all parties involved. The goal is to assess the potential benefits for each institution engaging in such collaboration by answering three main questions:

1. What are the potential incentives for schools to want to collaborate internationally?
2. What can each institution in the partnership contribute?
3. What do ASCO and VOSH/International each bring to the table?

We divided the participants into three groups to tackle different aspects of educational collaboration, namely student collaboration, faculty collaboration and advancement and research collaboration. The groups were formed so that each one would have a mix of faculty coming from the global north and global south to allow for different perspectives. The outcome of the discussion is summarized in **Table 1**.

Table 1. *Summary of break-out group discussions. Click to enlarge*

By sharing the result of the discussion, we wanted to bring to light the advantages for ASCO institutions to develop new or strengthen current international collaborations. According to the 2022 ASCO's "International Optometric Education Survey Report", 13 out of 25 schools who responded indicated they have a written agreement with an institution outside of the US or Canada.[4] In the same survey, schools were asked if faculty had expressed interest in international collaborations, and 18 schools answered yes. Those results suggest there is more interest by faculty than actual programs.

We hope this list of advantages can be talking points for faculty and administrators who would like to advocate for international partnership. Any faculty who has an interest in international programs are welcomed to join the ASCO OIE SIG and get in touch with the current chair, Dr. John Nishimoto. The SIG also developed a questionnaire for schools outside the US and Canada that would like to collaborate with ASCO institutions to promote more such exchanges. We hope our efforts can lead to elevating the profession of optometry worldwide.

The meeting also reinforced the importance of building synergies around agendas of common interest. The meeting concluded by establishing a working group made up of ASCO SIG IOE and VOSH/International members who have continued working on agreed actions emerging from the meeting and reported initial outcomes at the 2023 ASCO SIG IOE meeting. The partnership between ASCO-SIG-IOE and VOSH/International continues to evolve under the leadership of Dr. John Nishimoto.

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References

1. International Optometry Education [Internet]. Association of Schools and Colleges of Optometry; [cited 2024 Jan 25]. Available from: https://optometriceducation.org/for-faculty-administrators/international-optometric-education/
2. Plamondon KM, Brisbois B, Dubent L, Larson, CP. Assessing how global health partnerships function: an equity-informed critical interpretive synthesis. Global Health. 2021; 17(73). doi:10.1186/s12992-021-00726-z
3. Amisi JA, Cuba-Fuentes MS, Johnston EM, et al. A pragmatic approach to equitable global health partnerships in academic health sciences. BMJ Glob Health. 2023;8(5): e011522. doi:10.1136/bmjgh-2022-011522
4. Association of Schools and Colleges of Optometry (ASCO) (2022). International Optometric Education Survey Report, 2019-2022. Internal ASCO report: unpublished.

The Establishment of Optometry in Vietnam: A Short History

Robert E. Molter, Jr., OD, FAAO, Hai Le Thanh, MSc | Optometric Education: Volume 50 Number 2 (Winter/Spring 2025)

The first Vietnamese optometry class matriculated in 2014. Almost a decade later, Vietnamese optometry continues to progress with increasing numbers of optometrists being educated in two university programs. The profession is also making gains, albeit slowly, in being recognized and accepted within the Vietnamese private and public health systems. This article strives to give the reader a brief history of the efforts to introduce optometry to Vietnam, the reasons for bringing optometry to Vietnam, and the challenges yet faced by the profession there.

Background

Vietnam, a country in Southeast Asia, has a population that will reach 105 million by the end of 2024. Historically reliant on agriculture, Vietnam's economy has diversified and grown rapidly in past several decades with manufacturing, IT and tourism becoming significant sectors.[1] The move away from an agrarian society has accelerated the development of myopia and other eye care challenges in Vietnam. Myopia has been a particular problem in this region of the globe.

History and need for optometry

The Vietnamese healthcare system prior to the introduction of optometry included opticians, refractionists and ophthalmologists. Due to the shortage of ophthalmologists, coupled with the lack of ability for eye health diagnosis by opticians and refractionists, eye diseases such as glaucoma, diabetic retinopathy and other treatable or preventable eye disease often advance to severe stages before being detected. Access is often difficult for those in rural areas as most eye care is concentrated in urban centers. Additionally, routine eye health exams are not a common practice in this culture.[2]

Establishment of optometry programs

The need for optometry was recognized by the Vietnamese government several years prior to the start of formal training in 2014. With the assistance from several international non-governmental organizations (NGOs), agreements were struck and steps taken to begin two schools of optometry: the first in Ho Chi Minh City, in the southern part of Vietnam, and the second in the capital Hanoi in northern Vietnam. The curriculum for the optometry programs came primarily through the efforts of the Brien Holden Foundation (BHF) which coordinated the collaboration of many internationally recognized optometric educators. The curriculum is freely available online in several different languages, including Vietnamese at the Brien Holden Foundation website.[3] In addition, BHF has supported staff in Vietnam to work closely with the universities. The in-country staff has included an administrator to liaison with all stakeholders, as well as foreign optometrists who have served as educational consultants, didactic lecturers and clinical instructors. Stakeholder meetings continue to be held at least once every semester to discuss progress and impediments from the various perspectives of all involved.

Optometry begins in Vietnam

The year 2018 marked the true beginning of optometry in Vietnam with the graduation of the first 13 Vietnamese-educated, bachelor-level optometrists from the Medical University, Pham Ngoc Thach (UPNT) in Ho Chi Minh City. Hanoi Medical University (HMU) followed in 2019 with 43 graduates.

The first graduates were assigned to several public eye hospitals, but the department administrators had no official guidance about what the new graduates were capable of doing or how to utilize them. Many were simply put to work as refractionists. Then, on November 1, 2021, with support and encouragement of many stakeholders and several key educators, the Ministry of Health (MoH) put into effect a job code which outlined the duties of optometrists for the public hospitals. This represented the first codification of optometry as a profession in Vietnam. The job code includes many elements of the World Council of Optometry (WCO) definition of a Level 3 optometrist. Level 3 of the WCO includes: optical technology services, visual function services and ocular diagnosis services.[4] It excludes ocular therapeutics; however, a recently passed optometry practice law

may open the door to therapeutics.

Several top optometry graduates, primarily from UPNT but also from HMU, have been employed as representatives by the major international ophthalmic industry leaders including Johnson & Johnson, Essilor, Zeiss, Rodenstock, as well as local rigid gas permeable (RGP) and orthokeratology labs. The technical education and English language skill of the optometrists lends itself well to these positions. Several of the teaching staff have also served important roles as interpreters and translators with the latest Orbis missions to Vietnam.

Educational self-sufficiency

Select early graduates were also offered university teaching positions. The optometry schools were designed to become self-sustaining with the graduates taking over full teaching duties as they gained experience and higher degrees. However, the plan encountered a problem as a masters-level optometry degree, a degree still unavailable in Vietnam, is required to teach in a bachelor-level program. Efforts to develop a Vietnamese master's program in optometry are underway and paperwork has been submitted, but approval is still pending. NGOs have sponsored, and some of the graduates have self-funded, study abroad to obtain masters-level degrees in optometry. There are now several Vietnamese graduates who have also begun PhD programs which, when repatriated, will boost the ability of the Vietnamese programs to grow, flourish and to be led by optometrists.

Early growth of the profession

Optometry Vietnam, as a section of the ophthalmological association, was officially recognized by the governing powers as a group in 2023. This recognition potentially allows the beginning of a formal optometric association. Organized optometry will be needed to advocate for the new profession as well as to develop relationships with the thought leaders in government and industry. These relationships will further serve to solidify optometry's place in the healthcare system. Both university programs have extracurricular optometry clubs and the HMU club recently affiliated with VOSH/International as a student chapter, furthering international cooperation and involvement. The first optometry-led educational conference was in 2022, hosted by UPNT and well-attended primarily by local eye care professionals of all levels. In December 2023, an educational conference was held in Hanoi with notable international speakers, again the topic concentration was myopia control with hundreds of attendees coming from all parts of the country. Also, several young Vietnamese optometry teachers and graduates have presented lectures and posters at several international conventions, with some of the posters and presentations winning awards for excellence. Optometry in Vietnam, even at this early stage, is showing great promise.

Additional schools required

The HMU program enrolls as many as 80 students each year; the UPNT program now enrolls close to 40. Doing the math illustrates the need for additional optometry programs to be formed in Vietnamese universities. Using American ratios, Vietnam currently needs over 13,000 optometrists to cover its current population.[5] By the time the new optometrists begin to retire, the country's need for optometrists will only be fractionally met by the two existing programs. Although there are now about 400 optometrists in Vietnam, where 5 years ago there were only a handful, the challenge of the future remains.

The decision of other universities to begin optometry programs will be driven in the future both by public health policy and economics. As optometry is more widely accepted and the benefits of routine care recognized by the public, economic drivers will increase the interest of students to study optometry. Private optometric practice will provide the graduate with greater income potential than the public hospital setting. To be more effective, current and future optometry programs should be designed or upgraded to provide a masters-level optometry degree as the default degree, and in time move to the OD degree. If we assume an average class size of 50, the math suggests that there will need to be as many as 10 optometry programs to meet the needs of the Vietnamese population. Even if ten schools were created now, it would still be 25 years until workforce needs could be met.

Challenges

Workforce aside, optometry as a profession has several other challenges in Vietnam. The challenge of creating a positive public perception of what optometrists provide faces each new graduate and hopefully will be accepted by these young optometrists as an opportunity for educating their patients. The new optometrist's training has included the ability to perform comprehensive dilated eye exams as well as diagnosing disease and they are encouraged to practice to the highest level of their ability throughout their education. However, many employed optometrists are not supplied with the proper equipment to provide comprehensive exams. Slit lamps and tonometers, let alone binocular indirect ophthalmoscopes, are rarely available. The cost of this equipment is too great for the graduates to supply themselves.

Cultural challenges also exist in Vietnam from the standpoint that the culture is very respectful of age and position within an

organization. The young optometrists are not comfortable with speaking up and pushing to practice to the full extent of their education. Culturally speaking, it is better to conform, respect the older workers and stay quiet.

Language is another potential challenge. Linguistic imperialism concerns aside, currently most optometric educational and scientific literature is published in English. Continuing professional development requires reading optometric journals which convey the latest findings in vision science. Although English is mandatorily taught in all Vietnamese schools and most Vietnamese university students have the basics, lack of practice erodes proficiency. Because of the foreign lecturers, the students at UPNT were exposed to English over the 4 years of their education. Most of these students gain a tremendous amount of conversational and scientific English skill simply because of exposure to spoken English daily. One challenge will be that this English proficiency will be lost in the future as native speakers take over those classes at UPNT. At HMU, the use of English in the classroom has not been common. Rather, the foreign educators there have either acted as coordinators of the class information to be presented or have had direct translators present in the classroom, which has proven to be inefficient. Going forward there will be a challenge to have the latest optometric information translated and relayed to the Vietnamese optometric community. This represents an opportunity for those fluent in English who can translate and disseminate the information necessary for the Vietnamese optometric profession to remain current.

Lastly, the challenge of licensing and scope of practice lies ahead. At the end of December of 2023, Vietnam's MoH listed optometry for the first time in the laws regulating the practice of medical technicians. The licensing and practice rules specifically listed three levels of optometry, the lowest being a certificate-level optometrist which would have a 2-3 year education. The second is the bachelor-level optometrist with at least 4 years of training, and the third level is categorized as a specialist of optometry most likely for those with a masters-level optometry education. The two existing optometry programs currently provide for a bachelor-level degree and thus are the second tier as described in this law, and there is no guidance as to the scope of practice of the optometrists other than what the public hospital job code describes for the bachelor-level optometrists. This may be an opportunity for the higher-tier optometrists, those with masters-level therapeutic training, to truly help their ophthalmology colleagues by handling many of the medical non-surgical cases if a job code can be developed with those specifications.

The practice rules handed down by the MoH at the end of 2023 have no testing requirement for licensure other that the successful graduation from the university program, although it stipulates that an optometrist must practice with a licensed optometrist or ophthalmologist for 6 months before obtaining his or her own license. There are also no required continuing education hours for the optometrist to maintain their license. These issues will need to be addressed in the future as new knowledge, techniques and technologies are adopted by the optometric profession to ensure Vietnamese optometrists remain current.

Summary

Ten years on, Vietnamese optometry has progressed from 13 timid first-year students and only a handful of foreign trained optometrists, to a self-reliant system of educating future eye care specialists. While more schools will be required to meet workforce goals in the future, the core practice of optometry has been codified within the private and public health systems, and the graduates are training to provide comprehensive visual and eye health evaluations. We must be reminded that even in the US it has taken over a century to develop our own optometric profession to the level we all now enjoy. Still, evidence reveals the seeds of global cooperation are bearing fruit regarding the early formation of the optometric profession in Vietnam, all with the goal of meeting the domestic eye care needs of the country.

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References

1. The World Factbook [Internet]. Washington, DC: Central Intelligence Agency; c1997 [cited 2024 January 24]. Available from: https://www.cia.gov/the-world-factbook/countries/vietnam/
2. Molter RE, Weaver JL, McAlister WH. Utilization Survey of the First Two Cohorts of the Optometry Graduates from the University of Medicine Pham Ngoc Thach in Ho Chi Minh City, Vietnam. Optom Educ. 2021, 46(3):26-30.
3. Global Optometry Resources [Internet]. Sydney, Australia: Brien Holden Foundation [cited 2024 January 24]. Available from: https://brienholdenfoundation.org/international-program/learning-resources/global-optometry-resources/
4. A Global Competency-Based Model of Scope of Practice in Optometry [Internet]. St. Louis, MO: World Council of Optometry; 2015. Available from: https://worldcouncilofoptometry.info/wp-content/uploads/2017/03/wco_global_compentency_model_2015_2015.pdf

Valuable yet Judgmental: Optometry Students' Perceptions of their Grand Rounds

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Background

In the realm of health education, the value and efficacy of grand rounds as a teaching-learning method has been a subject of debate.[1] In contrast to several other health disciplines, optometry grand rounds have yet to be thoroughly studied.[2,3,4] Consequently, there exists a gap in understanding whether this traditional educational pedagogy is still effective and aligns with the educational needs in optometry education. By identifying both the strengths and areas for enhancement of the method, a program can better align this teaching approach with evidence-based practices and recommendations, thereby ensuring its effectiveness in application.

Grand rounds have a long history in medical education and are a prevalent and effective teaching-learning method in health sciences education.[1,2] Traditional grand rounds, as described in the literature, originated from bedside teaching, and due to popularity, students' attendance increased, and the teaching moved from the bedside to a lecture hall.[1] This teaching-learning method captures students' interest by applying patient-centered, evidence-based practice compared to classic lecture presentations.[5] Case discussions during grand rounds provide an educational platform for improving clinical knowledge development while increasing the student's diagnostic reasoning abilities.[5,6] Fasbinder et al.[4] suggest that grand rounds should be used to create an educational environment where principles such as critical clinical thinking and integration of knowledge can be implemented. Sandal et al.[7] affirm that grand rounds serve as a conduit for disseminating knowledge, changing health professionals' behavior and improving patient outcomes.

Herbert and Wright[2] report that grand rounds have always been a respected teaching-learning method, but it has lost its attraction due to audience boredom and lack of case appropriateness. It is also important to modernize this pedagogical approach to serve the current generation of students.[8] While current literature offers guidance on the implementation of grand rounds,[7,8] there exists a significant gap in our understanding, particularly concerning students' perspectives about the learning environment through this pedagogical approach in optometry education. This article addresses that gap by exploring optometry students' perceptions of grand rounds as a teaching and learning tool.

Study Design/Methods

Ethical clearance to conduct the study was obtained from the Health Sciences Research Ethics Committee (HSREC) (HSREC no 128/2016). The University of the Free State, South Africa, offers a four-year undergraduate Baccalaureus Optometry degree that prepares students to practice optometry in accordance with category three (ocular diagnostic services) as outlined in the World Council of Optometry (WCO) model framework.[9] The department has embraced a didactic grand rounds teaching and learning strategy, which is widely recognized as the prevailing format for grand rounds in health sciences education.[1] Attendance at Friday morning sessions was mandatory as it contributed to clinical attendance. This mandate applied to students in their second to fourth year and the department's eight faculty members. Therefore, the sample population for this study included all students enrolled in their second, third and fourth year **(Table 1, below)** in the undergraduate optometry program during 2017 (n=68).

At the beginning of the academic year, a predetermined schedule assigned three students to present in each session, ensuring that each student presents only once. The sessions ran from March to September of 2017. During these sessions, third-year students presented self-identified general optometry cases. These included cases that only required refractive management interventions. This approach was employed to familiarize the students with the grand round format and to enhance their comfort level in speaking before a large audience. The fourth-year (final-year) students showcased specialized optometry cases, including those related to contact lenses, low vision, pathology, binocular vision, or pediatric vision. According to the schedule, all fourth-year students presented during the first half of the year, followed by the third-years, completing the schedule in September. Students were provided with a rubric and a presentation template at the beginning of the year. Students also participated in an introductory session where all expectations and requirements were thoroughly explained. To adhere to the guidelines mentioned by Sandal et al.,[7] the presenters were assessed according to the given rubric. Academic staff members and fellow students did the assessment. The assessment mark counted towards the overall formative assessment mark for the

relevant module.

This study formed part of a larger project aimed at determining undergraduate optometry students' experiences and perceptions of teaching-learning methods based on the experiential learning theory.10 All members of the sample population received information regarding the research project at the beginning of the year and were invited to participate in the study. The informed consent affirmed participants' voluntary agreement to partake in the research, with the option to withdraw at any point during the questionnaire completion. No compensation was offered for participation. Participants were also assured of confidential data handling and guaranteed anonymity as no personal information such as names or student numbers were requested, and unique code numbers were assigned to each questionnaire. This study used a qualitative case study approach with an open-ended questionnaire. By employing the questionnaire, students were prompted to partake in reflective practice and to facilitate this, the questionnaire was customized to align with Gibbs's cycle of reflection.[11] **Appendix A** contains the open-ended questions that were asked and provided in hard copy after the completion of the learning experience. The questionnaire required approximately 20-30 minutes to complete.

During the first half of the year, the questionnaire was exclusively extended to fourth-year students (n=17) following their individual presentation experience. This was done to capture the presenter's viewpoint. As the third-year students presented for the purpose of familiarization, they were not included in the invitation to participate in the questionnaire as presenters. On the last session in September (2017), the second-, third- and fourth-year students (67) who attended the specific session were invited to complete the questionnaire. They were asked to reflect on their experience as attendees throughout the year. As a result, the fourth-year students completed the same questionnaire twice to incorporate their perspectives as both presenters and attendees.

Thematic analysis was conducted to identify key themes.[12] During the analysis, the first author was guided by three key phases.[13] In the descriptive phase, the first author gained intimate knowledge of the data and obtained a sense of the whole by typing the questionnaires verbatim.[14] The analysis phase followed, identifying and refining themes using response codes.[15] The number of themes was reduced by creating a table with initial categories and patterns, and connections within and between themes were made to create primary and sub-categories.[16] An independent co-worker checked the groupings and categories to ensure authenticity. In the final stage, interpretation or compilation, the themes and connections were used to explain the findings and to attach meaning and significance to the analysis.16 Themes were further refined to include supporting quotations made by the participants. To support trustworthiness, the researchers in this study kept an audit trail of the procedures and processes used.[17]

Results

The response rate for completing the questionnaire at the end of the year from an attendee's perspective was 98.5% **(Table 1)**.

TABLE 1:
Sample population with response rate of second- to fourth-year undergraduate optometry students that completed the questionnaire survey.

YEAR OF STUDY/ACADEMIC YEAR	II	III	IV	TOTAL
Sample population	20	31	17	**68**
Number of completions as attendees	20	31	16	**67**
Number of completions as presenters	-	-	17	**17**

Table 1. *Click to enlarge*

Females dominated the attendee population, and only 29.4% were male. The median age of the students was 21.0 years, with a minimum age of 19 and a maximum age of 33. All 17 students completed the questionnaire as presenters. Within this group, only four were male, and a majority of eleven students were 21 years old, while the remainder were 22. In the questionnaire, participants were asked about their experiences and perceptions of grand rounds as a teaching and learning method, along with themes of the objective, strengths and weaknesses, personal feelings and recommendations. After the interrogation of the data, subthemes emerged. The results below portray the themes **(Figure 1)** and the responses of the presenters and the attendees.

Figure 1. *Click to enlarge*

Theme 1*: Objective. What were the objectives of the session in which the teaching and learning method was used?*

Presenters: In the questionnaire, participants were asked about the objective of grand rounds, and from the presenter's view, many reported that it was the presentation of a clinical case to peers. They elaborated that to present the clinical case, they had to reflect on their experience in the clinic, analyze the tests performed on the patient and the results and research other cases similar to the relevant clinical case. The advice provided by peers and faculty members on a specific case was also included. One participant described the objectives as follows:

> *Presenting a case seen in the clinic, where you then present the clinical finding and do research on a relevant topic. Students and lecturers then advise you on how to improve skills. [P3]*

Attendees: Most attendees expressed that the primary objective of attending grand rounds was to learn from the clinical cases and experiences shared and discussed by fellow students. Within this peer learning experience, they could learn from other's mistakes and improve their clinical skills as they observed different clinical experiences of their peers. The more senior students specifically mentioned that by attending grand rounds, they could improve their knowledge of pathology because rare cases often were presented as one participant labelled the objective as

> *to see different cases of patients, to improve our clinical techniques and to know how to approach different types of patients. [P22]*

Theme 2*: Personal feelings. How did you feel before, during and after this teaching and learning method / experience?*

Presenters: Most of the participants who presented felt negative before the learning experience. Feelings of stress, nervousness and fear were expressed. These feelings mainly surfaced because this experience involved public speaking. Some participants had positive feelings before the presentation, such as excitement and enjoyment, like this participant who stated,

> *'(I was) excited to talk about my interesting case I had in the clinic that had myself and the supervisors thinking outside the box' [P9].*

The participants' negative feelings transformed into positive ones, with nearly all respondents indicating a positive shift in their feelings after presenting their cases. They were mostly relieved after the grand rounds, experiencing it as positive. Other feelings mentioned included enlightenment, happiness and satisfaction. The positive feelings stemmed primarily from participants' perceptions that they had worked hard as this participant mentioned

> *'I feel I've done a good job! I could answer my questions carefully because I was well prepared' [P6].*

The positive emotions stemmed from their perception of the experience as informative. Additionally, they noted an enhanced integration between foundational knowledge and clinical application and acknowledged the importance as expressed by this participant:

> *'Just realised again how important it is to apply what we learn theoretically practically and not to separate theory and practical' [P12].*

Attendees: The attendees' feelings before the experience were evenly divided between positive and negative. Participants voiced negative feelings mainly because the grand rounds was early on a Friday morning, so they felt annoyed, tired and not in the mood. A second-year student mentioned feelings of irritation, intimidation and nervousness and reported that

> *'as second year I know little and I get on my nerves if the third and fourth years speak with a lot of knowledge (it feels unreal that I almost have to treat patients), and I felt that I had little knowledge and was unsure why I had to attend' [P10]*

Positive feelings, such as excitement, interest, relaxation, calmness, curiosity and eagerness, were reported during the learning experience. The participants contended to have felt interested and informed during the grand rounds. In the words of participant 42:

> *'I was excited to see many new things and learn about weird and wonderful cases'.*

The interest in and sense of expanding knowledge were sparked, particularly by the unique and fascinating cases, especially those involving research.

Most of the participants reported that they felt positive after attending grand rounds. Other feelings related to being informed were expressed.

> *'I am informed about other diseases that I did not know about and also have extra knowledge from cases and mistakes'[P1].*

Other feelings mentioned were feelings of becoming educated, enlightened, enriched, fulfilled and satisfied and enlightened as this participant expressed the feeling after.

> *'Enlightened and feeling like I know a bit more or want to see or try something different in clinic' [40].*

These feelings they reported were mainly due to the participants experiencing the grand rounds as a meaningful interactive teaching-learning method. A few participants responded with negative feelings after the grand rounds. Feelings reported were confusion, being overwhelmed, tiredness, fear and being upset. These negative feelings mainly originated from the comments and questions after the grand rounds as this participant voiced their feelings as

> *'scared and upset more often than not because the lecturers' comments made me question my career choice' [P36]*

Theme 3*: Strengths and weaknesses. Based on your experience, what would you say are the strengths and weaknesses of this teaching and learning method?*

Presenters and attendees: The participants identified several strengths of this teaching and learning method. The first strength is that they identified it as a practical teaching and learning method that creates interaction and insightful discussions. They also felt that the teaching and learning method created an opportunity for peer learning and to derive valuable lessons from both personal and other's mistakes. As one participant mentioned,

> *you learn the best through mistakes, so you can relate to the students presenting and learn from their mistakes [P13].*

They also benefitted and felt that the reflection on the case and the engagement in research provided valuable insights and enhanced clinical techniques. Knowing that they will need to present ensured thoroughness in the clinic to avoid oversights during the presentation, and the presentation itself built self-confidence and promoted thinking and adaptability, as noted by this participant,

> *it forces us to think fast and step out of our comfort zones. [P13].*

The cases presented also created an understanding of real-world patient scenarios, and the sessions provided exposure to a diverse range of cases and that

> *would have taken me years to obtain experience in all these cases myself. Now I saw all of them. [P22]*

The participants mentioned a few weaknesses of this experience. The experience involved the presentation to a large audience, and some participants found it stressful as this participant stated,

> *'The fact that it is done in front of many people can often make non-public speakers feel uncomfortable and can, at times, be very unpleasant' [P13]*

Another area for improvement, according to participants, is that they felt that it might not be relevant to junior students in the department, as students in the early years might not have the foundational knowledge. This was not only mentioned by the second and third years but also by the fourth years, as they had experienced it in their early study years. One participant mentioned,

> *'The second years may feel lost in the beginning because there are terms used that had not been taught to us yet, and then we don't necessarily concentrate, and the learning experience was wasted.' [P9]*

The main weakness of this teaching-learning method, as identified by the participants, is that they believed it needed to be applied in a safe learning environment. They felt that the experience was critical and judgemental, like being executed or being in a court trial. As stated by these participants,

> *'Not feel safe in environment – you feel on edge if presenting if you're going on an execution.' [P45]*

> *'students are just students and grand rounds is a learning experience and not a court trial' [P11].*

Based on the data, it appears that the presence of faculty members during the sessions contributed to this weakness as one participant mentioned,

> *'It often happens that (faculty members) strongly criticise the students, so I was incredibly scared what they would say after the time' [P51]*

> *'they aren't always aware of the difficulty of the patient, therefore being too judgemental and strict.' [P54]*

This weakness was reported throughout the data. Participants felt exposed during this experience and perceived it as intimidating. They provided the following reasons:

- The feedback was sometimes destructive and exposed the student:

> *'The feedback is a bit harsh at times and critical and not constructive, which not only puts a damper on the proceedings but fuels the negative association with this experience.' [P2]*

- Challenging questions are asked and the way the questions were asked was negative:

> *'The questions asked afterwards sometimes are rude and degrading.'[P28]*

- Mistakes were only pointed out and not explained

Theme 4: *Recommendations. What can you recommend to enhance the teaching and learning method in the future?*

Presenters: From the presenter's view, a category to create a safer learning environment emerged. Firstly, the participants recommended that the supervisor involved in the case should review the case before the presentation as this participant mentioned that

> '*Supervisors guide students in clinic and help with differential diagnosis and final diagnosis. Thus, the final diagnosis isn't always that of the student, but a supervisor. It will help if supervisors give feedback on cases before presented' [P3]*

Secondly, they recommend that the criticism provided should be constructive and not to destruct the students' self-esteem. Several participants also recommended that the feedback be given in private to each presenter and not in the presence of the whole audience. The participants mentioned that, in their opinion, the feedback should be

> '*more educational and supportive rather than the bad criticizing environment it is in at this stage'[P59].*

The presenters also advised establishing ground rules regarding attendee punctuality. One participant emphasized,

> *'I would only suggest that all persons attending grand rounds should be on time, including lecturers as it is very rude to be late and enter the room in the middle of a students' presentation [P54].*

They also felt that only a certain number of questions should be allowed to be asked to each presenter. They recommended setting clear expectations for each year-group on the presentations to feel better prepared.

Attendees: The participants also made recommendations about the type of case presented. The participants stated that there should be a standard set for cases to prevent non-interesting cases from being presented. One participant mentioned that only interesting cases from the specialized clinics should be presented. Moreover, it should be ensured that there is no repetition of

cases. A fourth-year student also mentioned that the research should be on new information and not a repetition of lectures. They also recommended that lecturers present unusual cases they had seen. The participants also suggested that the case reports should be accessible post-presentation, in line with the recommendation put forth by a specific participant:

> *'Maybe students can also make a grand rounds journal to remember all the cases and conditions and management' [P33].*

A final recommendation made by the participants involved the attendance of the grand rounds. However, there was no unanimous agreement on which year groups should attend in grand rounds. Some participants asserted that second-year students should exclusively attend later in the year. As this second year stated,

> *'I would let the second years sit in for the second semester when they have been taught the majority of the terms and tests being talked about so that they know what's going on' [P9].*

Some third- and fourth-year students proposed that even first-year students should be present according to the view of this participant:

> *...first years should also attend grand rounds. This will enhance their knowledge from an earlier stage. [67].*

Due to compulsory attendance, certain participants suggested a modification in the schedule by shifting the time and holding the sessions every other Friday.

Discussion

In the evolving landscape of health sciences education, grand rounds has held its place as a venerable teaching-learning method. However, despite its historical reverence, this pedagogical approach has encountered challenges that demand attention. The decline in appeal has raised questions about its overall efficacy. This study explored new and uncharted territory by acknowledging the necessity to update educational approaches in line with the preferences of the current generation of students. This study successfully addressed this gap, and its importance lies in the revelation of student viewpoints. Exploring student perspectives is vital to ensuring the effectiveness, enduring value and relevance of grand rounds in the optometry programme at the University of the Free State, South Africa.

The exit level outcome of presenting a clinical case requires students to demonstrate the integration of required theoretical knowledge and clinical skills. This demonstration occurs during the presentation to fellow students and optometrists, focusing on the clinical analyses of the case. Additionally, students must reflect on this case, demonstrating the appropriate management of ocular and visual problems. Through this reflection, the students can draw connections between knowledge learned in the classroom and their clinical learning experiences.[18] From the presenters' responses, it could be inferred that grand rounds as a teaching-learning method provided this reflective learning experience. Our findings reinforce previous research, which has reported that principles such as critical thinking and integration were stimulated during the reflection. Literature also suggests that going through reflective practice improves clinical skills.[5,6,7]

The main element contributing to the attendees' positive experience was peer learning through the presentation of a peer's personal clinical experience. Students recognized that they learned more from their peers and supported using grand rounds as a teaching-learning method. This might be due to their close association with their peers' experience, their respect for the presenter's work and the effort of standing in front of a group of people to present the case. Furthermore, the exposure to different, interesting and unique cases was acknowledged as a key factor that enhanced the learning for the attendees. It seems that students preferred a visual, practical teaching-learning method and perceived the presentation of a clinical experience beneficial, as well as the research component that also added to the knowledge enhancement.

The most significant finding of the data analysis on this experience was the voice of the participants urging educators to remember that they are merely students and should be treated as such. The success of this experience was overshadowed by an atmosphere that participants perceived as stressful, degrading, critical, judgmental and cruel. While we acknowledge that

moderate stress can enhance learning[19], it is important to exercise caution to avoid suppressing learning experiences by minimizing the occurrence of intimidation and aggressive behaviours. Students will take risks and engage in learning activities when they feel that they and the educator have a relationship of trust and respect.[20] The data revealed the validity of Edmondson's definition of psychological safety and the trust relationship between the student and educator, wherein students should have confidence that educators will not embarrass, disrespect, or punish them.[21] The adverse impact of destructive criticism extended beyond the presenters and adversely affected the attendees as well. The absence of support and assistance they experienced could have led to disengagement from the learning experience. When examining previous research indicating that learning behaviour thrives on trust, respect, empathy and recognizing mistakes as integral to the learning process, it becomes evident that these elements were lacking during the grand rounds in this study.[20]

The overall data analysis indicated that students appreciate the educational value of grand rounds, suggesting early exposure as a recommended practice. This supports continuing with second-year attendance, although some participants will disagree. The authors believe that with this early exposure, the students are empowered to scaffold their theoretical and clinical knowledge progressively and, ultimately, their understanding and independence, which will favour their ability to do their own presentations in the future. It would prepare and encourage participation in discussions on clinical matters. Early exposure to clinical situations also motivates and fosters the integration of theory and clinical practice. This was confirmed by the responses of several fourth-year optometry students who expressed the opinion that, after having gone through this experience for three years, they recommended that even first-years become part of this teaching-learning exercise. This confirms the positive contribution of this experience over several years.

Limitations include the possibility of participants completing the questionnaire to please academic staff members despite the anonymization of the questionnaire. Upon reviewing the results, the authors maintain confidence that the responses genuinely reflect the participants' experiences. This study offers valuable insights into the adaptation of teaching-learning pedagogy for grand rounds within a particular institution and with a specific cohort of students. However, due to this specificity, the findings cannot be generalized. Therefore, there is a need for additional research to explore students' perspectives on grand rounds as a teaching-learning method.

Conclusion

The results of the study show that one of the main objectives of the grand rounds is to allow students to learn from each other and share their experiences. Optometry students in this program found grand rounds to be a site of valuable learning but emphasized the need for improvements in constructive feedback and creating a safer, more supportive learning environment.

References

1. Agee N, Komenaka IK, Drachman D, Bouton ME, Caruso DM, Foster KN. The Effectiveness of Grand Rounds Lectures in a Community-Based Teaching Hospital. J Surg. Educ. 2009 Nov-Dec;66(6): 361-366. doi: 10.1016/j.jsurg.2009.07.006
2. Herbert RS, Wright SM. Re-examining the Value of Medical Grand Rounds. Acad Med 2003 Dec;78(12): 1248-1525. doi: 10.1097/00001888-200312000-00013.
3. Laibhen-Parkes N, Brasch J, Gioncardi L. Nursing Grand Rounds: A Strategy for Promoting Evidence-Based Learning Among Paediatric Nurses. J Pediatr Nurs. 2015 Mar-Apr;30: 338-345. doi: 10.1016/j.pedn.2014.07.008
4. Fasbinder DJ, Heys DR, Holland GR, Keerthy A, Murdoch-Kinch CA, Inglehart MR. Grand Rounds for Dental Students: An Exploration. J Dent Educ. 2015 May;79(5): 510-522.
5. Gardner G, Woollett K, Daly N, Richardson B, Aitken LM. Innovation in clinical learning for the acute hospital environment: Nursing grand rounds. Nurse Educ Today. 2010 Nov;30: 737-741. doi: 10.1016/j.nedt.2010.01.015
6. Stieger S, Praschinger A, Kletter K, Kainberger F. Diagnostic grand rounds: A new teaching concept to train diagnostic reasoning. Eur J Radiol. 2011 Jun;78: 349-352. doi: 10.1016/j.ejrad.2009.05.015
7. Sandal S, Iannuzzi MC, Knohl SJ. Can We Make Grand Rounds "Grand" Again? J Grad Med Educ. 2013 Dec;5(4): 560-563. doi: 10.4300/JGME-D-12-00355.1
8. Jattan A, Francois J. Twelve tips for adapting grand rounds for contemporary demands. Med Teach. 2022 Feb;44(2):144-148. doi: 10.1080/0142159X.2021.1898573
9. A Global Competency-Based Model of Scope of Practice in Optometry [Internet]. St. Louis, MO: World Council of Optometry; c2015 [cited 2023 November 10]. https://worldcouncilofoptometry.info/wp-content/uploads/2017/03/wco_global_competency_model_2015.pdf
10. Kolb AY, Kolb,D. Experiential Learning Theory as a Guide for Experiential Educators in Higher Education. A Journal for

Engaged Educators. 2017 Jun;1(1): 7-44.
11. Husebø SE, O'Regan S. Reflective Practice and Its Role in Simulation. Clin Simul Nurs. 2015 Jul;11: 368-375. doi:1016/j.ecns.2015.04.005
12. Maguire M, Delahunt B. Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. All Ireland Journal of Higher Education. 2017 Oct;9:3351. doi:10.62707/aishej.v9i3.335
13. Burns N, Grove, S. The Practice of Nursing Research. 5th ed. Missouri: Elsevier Saunders; 2005.
14. Nieuwenhuis J. Qualitative research designs and data gathering techniques. In Maree K, editor. First steps in research. Pretoria: Van Schaik. 2007.
15. Castro FG, Kellison JG, Boyd SJ, Kopak A. A Methodology for Conducting Integrative Mixed Methods Research and Data Analyses. J Mix Methods Res. 2010 Sep;4(4): 342-360. doi: 1177/1558689810382916
16. Taylor-Powell E, Renner M. Analysing Qualitative data [Internet]. Semantic Scholar; c2003. Available from: https://pdfs.semanticscholar.org/8ee4/a0c8532720200bb4359cf5a3741fac60ca74.pdf
17. Polit DF, Beck CT. Essentials of nursing research – methods, appraisal and utilization. Philadelphia: Lippincott Williams & Wilkens; 2006.
18. King AE, Joseph AS, Umland EM. Student perceptions of the impact and value of incorporation of reflective writing across a pharmacy curriculum. Curr Pharm Teach Learn. 2017 Sep;9: 770-778. doi: 10.1016/j.cptl.2017.05.010
19. Córdova A, Caballero-García A, Drobnic F, Roche E, Noriega DC. Influence of Stress and Emotions in the Learning Process: The Example of COVID-19 on University Students: A Narrative Review. Healthcare (Basel). 2023 Jun;17;11(12):1787. doi: 10.3390/healthcare11121787.
20. Johnson CE, Keating JL, Molloy EK. Psychological safety in feedback: What does it look like and how can educators work with learners to foster it? Med Educ. 2020 Jun;54(6):559-570. doi: 10.1111/medu.14154. PMID: 32170881.
21. Edmondson AC. Psychological safety and learning behavior in work teams. Adm Sci Q. 1999;44(2):350-383. doi:2307/2666999.

Appendix

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Development and Validation of an Analytic Rubric for Assessing Retinal OCT Skills in Optometry and Ophthalmology Training

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Background

Globally, 2.2 billion individuals have vision impairment or blindness, and over one billion of them are caused by unaddressed preventable ocular conditions.[1] The key to resolving this challenge is making eyecare services and timely interventions accessible. evidence-based medical practices suggest that early diagnosis and treatment methods are pivotal.[2] This strengthens treatment outcomes and restores or preserves visual function in complex ocular diseases, such as age-related macular degeneration and diabetic retinopathy. These retinal conditions, left untreated, can lead to irreversible damage and vision loss.

Continuous innovations in ocular imaging technology have predominantly focused on refining the technical aspects of clinical imaging to address critical concerns. These advancements have led to the development of non-invasive, high-speed and high-quality images that enable precise and early diagnosis of ocular ailments. Optical coherence tomography (OCT)[3,4,5] stands at the forefront of ocular imaging, functioning as a valuable biomarker for the early detection of retinal diseases. The evolution of OCT, transitioning from Time-Domain to Spectral-Domain to Swept-source,[6,7] has empowered the acquisition of cross-sectional B-scan images of both retinal and anterior segment structures.

This has significantly elevated the axial resolution and imaging speed, surpassing the threshold of 25,000 A-scans per second. However, this surge in technical advancement necessitates a parallel investment in highly skilled eyecare professionals.[8] Beyond performing OCT procedures, clinician optometrists and ophthalmologists must demonstrate proficiency in image interpretation, clinical reasoning and interconnecting diagnostic outcomes with the patient's holistic clinical presentations to prescribe appropriate management protocols. While the curricula of undergraduate and postgraduate optometry/ophthalmology training encompass the evaluation of diagnostic skills, there is an absence of robust rubric-based evaluation methods to score their competency levels.

A rubric is a widely used pivotal scoring tool in medical education.[9-13] It presents a structured, objective mechanism without any subjective influences, ensuring an equitable evaluation of a trainee's performance. however, to our knowledge, a rubric-based assessment tool specific to retinal OCT has not been reported in the literature. therefore, in this study, we have developed and validated an analytical rubric to evaluate trainee's proficiency in performing and interpreting retinal OCTs.

Materials and Methods

The present study was reviewed by the scientific committee and granted initiated at LV Prasad Eye Institute, India, and received an exemption from the Institutional Review Board (IRB), as it does not involve experimental human or animal research. The study adhered to tenets of the Declaration of Helsinki, and informed consent for participation in the study has been obtained.

The study adopted a modified Dreyfus scale[14] with the following stages of competence: novice, beginner, advanced beginner and competent, excluding the proficient and expert stages. This modification was made to align with our objective of assessing ophthalmology and optometry trainees at the basic and entry levels. This study involved two phases: OCT rubric development and validation **(Figure 1)**. It was initially drafted by the first author and subsequently refined in collaboration with co-authors before being presented to internal and external validators.

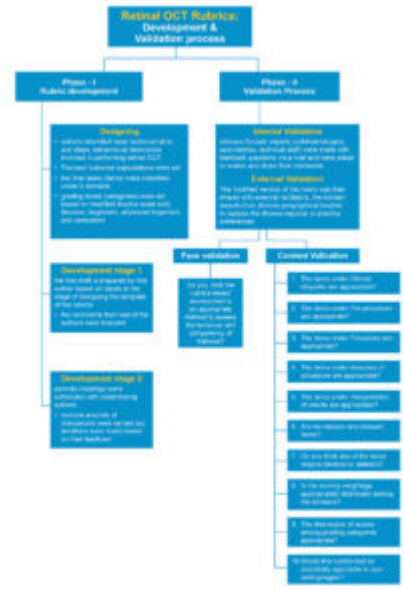

Figure 1. *Development and validation process. Click to enlarge*

In the validation phase, the authors engaged internal and external experts in ophthalmology and optometry with a specialization in retinal diagnostics. These validators had professional experience spanning 5 to over 10 years in clinical practice, academic teaching and student training. Invitations were extended via email, offering an overview of the study's objectives and encouraging voluntary participation. The respondents willing to participate were emailed a modified rubric assessment with face and content validation questions **(Figure 1)**. Twenty-one validators, comprising 10 internal (four ophthalmologists and six clinical optometrists) and 11 external validators from India, Singapore, the United Kingdom, Australia, Saudi Arabia and the United States of America, who practice ophthalmology (n=2) and optometry (n=9) were included in the study.

The OCT rubric comprised five domains **(Table 1)**, clinical etiquette, pre-procedure, procedure, accuracy of procedure and interpretation of results, with four grading categories of novice, beginner, advanced beginner and competent. Uniform weightage was assigned for the tasks or items within the domains. However, the total weightage of each domain varied, factoring in the relative significance of technical proficiencies encapsulated within each individual domain.

Table 1. *Click to enlarge*

The study employed a set of eleven questions to thoroughly assess the dimensions of the rubric, including content, construct and scoring criteria as outlined in the literature[15] **(Figure 1)**. This assortment of questions was designed to facilitate face (n=1) and content validations (n=10), encompassing a comprehensive evaluation of the rubric's facets. The sequential process of face and content validations is shown in **Figure 1**.

Results

The validation process involved the participation of both internal (n=10, 47.6%) and external (n=11, 42.4%) validators. Among them, 23.8% (n=5) were ophthalmologists and 76.2% (n=16) were optometrists.

Face Validation

In face validation, 89% of the participants either strongly agreed to or agreed to rubric-based assessment as an appropriate method to evaluate a trainee's skill competency **(Figure 2)**.

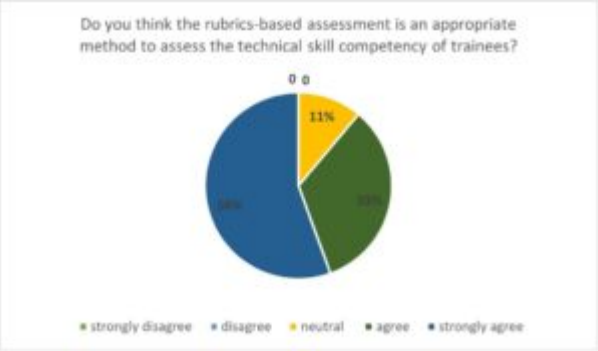

Figure 2. *Click to enlarge*

Content Validation

Type of responses from validators: The feedback provided by the internal and external validators was systematically collected and examined by the authors. The validators' responses varied between 'agreeing to' or 'not agreeing to' for the validation questions and 'providing' or 'not providing' a comment. Therefore, the authors categorized the type of response into three categories (positive, negative and neutral), as shown in **Figure 3**. Most validators responded positively to the validation questions (mean =18.2; 86%), of which 13% provided comments. Over 12% (mean =2.5) of validators responded negatively, of which 44% provided comments.

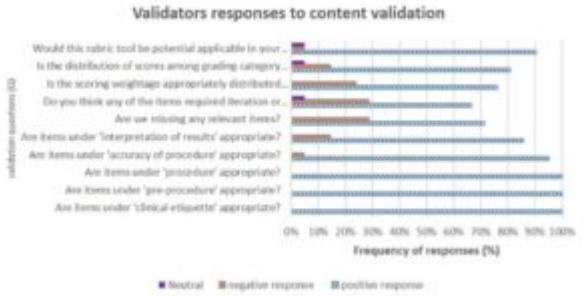

Figure 3. *Validators' responses to content validation questions.Click to enlarge*

Validator comments for domain-specific content: The authors discussed and deliberated on the comments proposing modifications. Only the comments that garnered unanimous agreement among the authors were integrated into the rubric.

Clinical Etiquette

The validators found it difficult to differentiate between the third and fourth points/tasks (P3 and P4) in the clinical etiquette

domain of the rubric. They suggested using simple language and stressed the importance of obtaining patient consent before conducting the OCT procedure. These comments were accepted by the authors, and the rubric was modified accordingly. For example, pre-iteration P3: communicates to patients professionally; P4: responds to the patient's queries appropriately; post-iteration P3: maintains professionalism with patient verbally and non-verbally; P4: responds to the patient's queries relating to the test appropriately and ensures the patient's willingness to undergo the test (**Table 1**, domain: Clinical etiquette, steps 3 and 4).

Pre-Procedure

The Validators recommended utilizing suitable language when communicating with the patient to describe the test procedure in simple terms to enhance comprehension. The authors also concurred that simplified language could improve patient compliance during the examination. Moreover, the authors were suggested to inform the patients about the potential requirement for pupil dilation and the importance of aligning the patients' canthus with the canthal mark on the instrument.

Procedure

In response to the validators' feedback, we have integrated appropriate scan selection protocols into the rubric (**Table 1**, domain: Procedure, step 2). Another significant observation from validators emphasized the importance of considering communication dynamics between students and patients during the procedure explanation. Accordingly, these aspects have been integrated into the rubric, delineated within the framework of clinical etiquette and pre-procedure (**Table 1**, steps 3 and 4).

Accuracy of Procedure

in response to the feedback requesting a concise delineation of the distinct artifact types along with examples, we have revised the rubric to include the patient-related, operator-related and device-specific artifacts (**Table 1**, domain: Accuracy of procedure, steps two, three and four)

Interpretation

In a routine diagnostic training practice, trainees are educated in diverse analysis protocols, such as single line scan, radial scan, macular volumetric analysis and OCT angiography analysis, where appropriate, based on the specific ocular disease conditions and diagnostic test requirements. This aspect of the trainees' ability to select an appropriate scanning protocol was suggested to the rubric as an evaluating pointer. The feedback concerning this aspect was positive, and the new element (**Table 1**, domain: Interpretation, step 1) was added in response.

Validators' Comments on the Rubric Construct and Scoring Criteria

A validator raised a query concerning the potential omissions of pertinent elements and recommended the inclusion of the limitations associated with normative databases and their applicability in patient outcomes.

A validator also commented on whether any aspect necessitated refinement. They proposed including a time limit to assess the precision of the procedure. The authors accepted this recommendation, integrating it as a novel item within the rubric.

Feedback from validators concerning the allocation of scores and weighting across different domains was diverse. Most validators (n,16; 76%) found the current distribution of weighting appropriate among procedure and accuracy of the procedure domains are given higher scoring (15 points) compared to other domains (10 points), including clinical etiquette, pre-procedure and interpretation. While one validator recommended assigning greater weightage to interpretation comparison to the accuracy of the procedure domain, others suggested an equal distribution across the domains. This current allocation aligns with the rubric's primary aim of assessing optometry/ophthalmology trainees, prioritizing procedural accuracy as critical to their development. Interpretation is weighted slightly lower to emphasize mastering foundational technical skills before advancing to higher-order clinical reasoning. While some suggested equal distribution across domains, the weighting reflects the focus on competencies essential at the trainee level.

Approximately 82% of validators expressed their belief in the potential applicability and adoption of the presented rubric tool in their respective clinical settings or regions. However, others remained neutral in their response, and this overall positive sentiment suggests a promising outlook for the rubric's practical implementation.

Discussion

A wide range of assessment methods[16] are available in the field of medical education, including essay questions, patient management problems, modified essay questions, checklists, objective structured clinical examinations, student projects, constructed response questions, multiple choice questions, critical reading papers, rating scales, extended matching items, tutor reports, portfolios, short and long case assessments, logbooks, trainer's reports, audits, simulated patient surgeries, video assessments, simulators, self-assessment, peer assessment and standardized patients. Each of these approaches brings its own strengths and limitations, contributing to the diversity of assessment strategies. In this landscape of assessment methodologies, rubric-based evaluation emerges as a versatile approach that streamlines assessment complexities and offers a framework for clarity and consistency. It stands out as a viable solution for the multifaceted challenges associated with evaluation.[9] A rubric is a structured tool that defines the assessment criteria and educational expectations and provides guidance for learning and evaluation.[17] It is a dynamic resource that guides the assessment process and facilitates a comprehensive feedback mechanism. These guidelines are instrumental in orienting trainees to accomplish tasks in accordance with protocols, enabling them to achieve higher levels on the competency scale. These predefined criteria improve the performance levels of trainees, making this assessment method beneficial for both learners and instructors.

Validity is a pivotal factor in enhancing the calibre of a rubric, functioning as a gauge to ascertain if it accurately measures the intended attributes. Therefore, this study undertook careful measures to formulate questions that draw insights from pertinent literature[15,18] on rubric development and validation. This meticulous approach aimed to refine the characteristics of the rubric, aligning it more closely with its fundamental assessment objectives.

This study assessed the positive (86%) and negative (12%) suggestions provided by the validators. the authors discussed the suggested modifications and incorporated the changes that they agreed on unanimously. simple language, underscoring the importance of obtaining consent before the OCT procedure, patient alignment with the instrument and providing clear instructions about the purpose of the test and its steps are some of the key recommendations included in the rubric. Moreover, the validators emphasized that trainees must possess knowledge about the potential image artefacts to enhance their comprehension and interpretation of OCT scans.

In response to the validator's comment, the rubric was revised to encompass tasks related to identifying different sources of artifacts,[7,19] namely patient-related, device-related and examiner-related. Moreover, the investigators agreed that it is important to assess a student's ability to select an appropriate scanning protocol. Commonly used scanning protocols in OCT retinal imaging, such as the three-dimensional cube, radial and raster scans, were included as examples in rubric.[7] The rubric also incorporated the time factor, wherever time measurement is extensively utilized, aligning with existing literature in medical education for assessing competence in training for medical procedures.[20]

The interpretation of findings necessitates advanced diagnostic skills, requiring the application of prior knowledge and understanding of the disease pathology to differentiate the abnormal findings from normal. the authors acknowledge that proficiencies lie within both the procedure and accuracy of the procedure domains, which are equally vital to ensure precise result interpretation. However, in the training phase, the students focus primarily on mastering the procedure, as inaccuracies in the execution of the procedure can adversely impact result interpretation. Therefore, the procedure and accuracy of procedure domains were assigned higher weightage compared to interpretation. While the rubric allocated different weightage to the five domains based on their importance and expected learning outcomes, equal scores were assigned to items or steps within the individual domains (e.g., steps under the clinical etiquette domain). This decision was based on the interrelation of these aspects, highlighting their collective contribution to a holistic understanding.

Limitations of the study

The inclusion of international validators for face and content validations is a notable strength, as it ensures diverse perspectives from experts with combined experience in clinical practice and training. However, the relatively small sample size of participants, despite their representation from diverse countries, is a limitation. This limitation arises from the study's selective inclusion criteria, focussing exclusively on experts in retinal imaging who are actively involved in teaching and training students. Future studies should address this by ensuring broader representation to enhance the generalizability and further validation of the findings.

Conclusion

While an assessment rubric has been previously introduced in ophthalmology training,[21-24] our study has developed a rubric specifically tailored for retinal OCT. We recommend that practitioners consider using this tool as a foundational reference,

adapting it to their unique practice settings. The retinal OCT rubric that has been developed and validated in this study provides a promising avenue for assessing the proficiency of trainees in performing and interpreting retinal OCT scans. The implementation of this analytics-based rubric has the potential to significantly enhance the quality of training and positively impact the overall standards of patient care.

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References

1. World Health Organization World Report on Vision [Internet]. England: International Agency for the Prevention of Blindness; c2019. Available from: https://www.iapb.org/learn/resources/the-world-report-on-vision/
2. Saleh GA, Batouty NM, Haggag S, et al. The Role of Medical Image Modalities and AI in the Early Detection, Diagnosis and Grading of Retinal Diseases: A Survey. Bioengineering (Basel) 2022 Aug;9(8). doi: 10.3390/bioengineering9080366
3. Kwan CC, Fawzi AA. Imaging and Biomarkers in Diabetic Macular Edema and Diabetic Retinopathy. Curr Diab Rep. 2019 Aug 31;19(10):95. doi: 10.1007/s11892-019-1226-2
4. Prakasam RK, Matuszewska-Iwanicka A, Fischer DC, et al. Thickness of Intraretinal Layers in Patients with Type 2 Diabetes Mellitus Depending on a Concomitant Diabetic Neuropathy: Results of a Cross-Sectional Study Using Deviation Maps for OCT Data Analysis. Biomedicines. 2020 Jul 2;8(7). doi: 10.3390/biomedicines8070190
5. Murthy RK, Haji S, Sambhav K, Grover S, Chalam KV. Clinical applications of spectral domain optical coherence tomography in retinal diseases. Biomed J. 2016 Apr;39(2):107-20. doi: 10.1016/j.bj.2016.04.003
6. Aumann S, Donner S, Fischer J, Muller F. Optical Coherence Tomography (OCT): Principle and Technical Realization. In: Bille JF, editor. High Resolution Imaging in Microscopy and Ophthalmology: New Frontiers in Biomedical Optics. Cham: Springer International Publishing; 2019. Pp. 59-85.
7. Bhende M, Shetty S, Parthasarathy MK, et al. Optical coherence tomography: A guide to interpretation of common macular diseases. Indian journal of ophthalmology 2018;66(1):20-35. doi: 10.4103/ijo.IJO_902_17 doi: 10.1007/978-3-030-16638-0_3
8. Chandra S, Rasheed R, Sen P, Menon D, Sivaprasad S. Inter-rater reliability for diagnosis of geographic atrophy using spectral domain OCT in age-related macular degeneration. Eye (Lond) 2022 Feb;36(2):392-97. doi: 10.1038/s41433-02--01490-5
9. O'Donnell JA, Oakley M, Haney S, O'Neill PN, Taylor, D. Rubrics 101: a primer for rubric development in dental education. J Dent Educ. 2011 Sep;75(9):1163-75.
10. Ferrara V, De Santis S, Melchiori FM. Art for improving skills in medical education: the validation of a scale for measuring the Visual Thinking Strategies method. Clin Ter. 2020 May-Jun;171(3):e252-e59. doi: 10.7417/ct.2020.2223
11. Kondo T, Nishigori H, van der Vleuten C. Locally adapting generic rubrics for the implementation of outcome-based medical education: a mixed-methods approach. BMC Med Educ. 2022 Apr;22(1):262. doi: 10.1186/s12909-022-03352-4
12. Nisbet G, Jorm C, Roberts C, Gordon CJ, Chen TF. Content validation of an interprofessional learning video peer assessment tool. BMC Med Educ. 2017 Dec;17(1):258. doi: 10.1186/s12909-017-1099-5
13. Yune SJ, Lee SY, Im SJ, Kam BS, Baek SY. Holistic rubric vs. analytic rubric for measuring clinical performance levels in medical students. BMC Med Educ. 2018 Jun 5;18(1):124. doi: 10.1186/s12909-018-1228-9
14. Dreyfus, SE, Dreyfus H. A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition. Distribution. 1980 Feb.
15. Moskal B, Leydens J. Scoring Rubric Development: Validity and Reliability. Practical Assessment Research and Evaluation. 2000 Jan;7.
16. Syed AT. Assessment methods in medical education. Int J Health Sci (Qassim). 2008 Jul;2(2):3-7.
17. Blommel ML, Abate MA. A rubric to assess critical literature evaluation skills. Am J Pharm Educ. 2007 Aug 15;71(4):63. doi:10.5688/aj710463
18. Reddy YM, Andrade H. A review of rubric use in higher education. Assessment & Evaluation in Higher Education. 2010 Jul;35(4):435-48. doi: 10.1080/02602930902862859
19. Chhablani J, Krishnan T, Sethi V, Kozak, I. Artifacts in optical coherence tomography. Saudi J Ophthalmol. 2014 Apr;28(2):81-87. Doi: 10.1016/j.sjopt.2014.02.010

20. Pusic MV, Brydges R, Kessler D, Szyld D, Nachbar M, Kalet A. What's your best time? Chronometry in the learning of medical procedures. Med Educ. 2014 May;48(5):479-88. doi: 10.1111/medu.12395
21. Green CM, Salim S, Edward DP, Mudumbai RC, Golnik K. The Ophthalmology Surgical Competency Assessment Rubric for Trabeculectomy. J Glaucoma 2017 Sep;26(9):805-09. doi: 10.1097/ijg.0000000000000723
22. Juniat V, Golnik KC, Bernardini FP, et al. The Ophthalmology Surgical Competency Assessment Rubric (OSCAR) for anterior approach ptosis surgery. Orbit. 2018 Dec;37(6):401-04. doi: 10.1080/01676830.2018.1437754
23. Justin GA, Soleimani M, Zafar S, et al. The Ophthalmology Surgical Competency Assessment Rubric (OSCAR) for Open Globe Surgical Management. Clin Ophthalmol. 2022 Jun 21;16:2041-46. doi: 10.2147/opth.S354853
24. Law JC, Golnik KC, Cherney EF, Arevalo JF, Li Xiaoxin, Ramsamy K. The Ophthalmology Surgical Competency Assessment Rubric for Panretinal Photocoagulation. Ophthalmol Retina. 2018 Feb;2(2):162-67. doi: 10.1016/j.oret.2017.06.002