Innovations in Optometric Education

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If you want something new, you have to stop doing something old — Peter F. Drucker

Innovations start with creativity. Imagining new things and exploring the ideas into the real world. Education system, being creative, has explored into many paths and now has taken this stage of virtual learning. In this article, we will see the paths taken by optometric education.

OPTOMETRY AND COMPETENCY

World Council of Optometry defines Optometry as a healthcare profession that is autonomous, educated, and regulated (licensed/registered) and optometrists are the primary healthcare practitioners of the eye and visual system who provide comprehensive eye and vision care, which includes refraction and dispensing, detection/diagnosis and management of disease in the eye and the rehabilitation of conditions of the visual system.¹

Schools and colleges of optometry train the students to achieve this goal. The common minimum optometry curriculum intends to build the course in such a way that the outgoing optometrists are well equipped for clinical care, specialty care, diagnostics and community eye care.² The education system revolves around the curriculum. In the 4 years of optometric education at the undergraduate stage, the curriculum is built in such a way that the training makes the student to evolve as an equipped optometrist. The conventional method of teaching is prevailing in many schools and colleges of optometry which is evolved in 19th century. Though there are many technological innovations and fast forward computational skills, optometry still in schools are thought in traditional way. New innovative models of teaching methods are adopted in few institutes.

CONVENTIONAL METHOD OF TEACHING AND ASSESSMENT

The conventional mode of teaching includes didactic lectures, presentations, practical sessions etc. With these methods students have to follow the teaching notes of the lecturers and write the examinations. In this way they do not link the connections between the clinical skills and basic science.

In the conventional method of teaching, basic sciences are taught first followed by clinical sciences. Students are not found to be applying the concepts of basic science into their clinical practice. Traditional assessment of students consists of the yearly system of assessments.² In most institutions, assessments consist of internal and external assessments, and a theory examination at the end of the year or semester. This basically assesses knowledge instead of assessing skills or competencies. This may not give us the holistic understanding about students’ knowledge. To fill the gaps in conventional teaching and assessment methods innovative models were evolved.

Innovative models of teaching³

1. Vertical integration

Integrating the clinical and basic science will help the students understand the importance of learning each process.⁴ By this method the knowledge and the skill are interlinked from the first year till they go in for independent practice in internship. What, why and how? These are the questions which are asked by the students at the entry of their curriculum. Thus each subject or the process is learnt with those questions. The curriculum has to be structured so that the link of subjects is done horizontally for each batch of students and taken up throughout the years.

Vertical integration – our experience

Vertical integration through student centred self-learning was initiated for the subjects of clinical refraction and binocular vision for the second and third-year students, respectively. In this integrative model, basic science courses taught in the first year of the programme were revisited while teaching applied sciences of clinical refraction and binocular vision. Students were briefed about the method of self-learning. Three of the five modules of clinical refraction, namely Basics of refractive error II (integrating visual optics + instrumentation), Classification and clinical examination of refractive error (visual optics + clinical examination of visual system) and Management of refractive error I (visual optics + optometric optics + dispensing optics)] and three modules of Binocular Vision which includes Esotropia, Exotropia and Incomitant deviations (integrating anatomy, physiology, clinical examination, clinical refraction, epidemiology, primary eye care, pediatric optometry and pharmacology) were done through vertical integration. The components of each module were clinical scenario, learning objectives, proficiency related to the objectives, study material and trigger questions. Students were grouped and faculty facilitated the learning. Assessment was done at the completion of every module. The feedback from the students and the

faculty were documented at the end of the semester.

The faculty and student feedback were positive towards this approach. Self-learning methods should be combined with conventional teaching methods. Skill-level acquisition and case analysis was faster and better compared to knowledge-level using this approach. Based on the faculty’s observation, this method enhances the practical skills of the student compared to traditional approach.

2. Basic Clinical Optometry Skill Training (BCOST)

Bed side learning is the concept used in medicine from early centuries. The trainees be along with the mentors in clinics and learn the techniques of examination. Such training starts at the later stage of education, i.e. during third or final year, thus students lack confidence in performing the skills. We evolved a model of teaching the skills before the knowledge is imparted to the students. This makes the students more competent in performing the skills thus when they learn on the purpose and indications for the skills their understanding is like written on a rock which is going to be there life long.

3. Problem-based learning

Other than the knowledge and clinical training, students also need analytical skills for assessing the case. The students have to be more skillful in analysing a case which makes the outcome more fruitful. This can be imparted by the problem-based learning (PBL). PBL is a group learning environment that involves a radical change in the way students learn and the role that academic staff play in facilitating learning. In this type, the case or a situation is given to the students and they discuss about it in a group. The mentors facilitate the discussion, thereby the learning process and the analytical ability is increased. At Deakin University, they have well-established PBL curriculum. They have mentioned that in PBL, identifying the groups also play a major role, as there is strong influence of behaviour of one student on the other in the team.

Innovative models for assessment

Assessment is traditionally done as written examination or practical assessment on clinical skills. Several new methods and tools are now readily accessible, the use of which requires special training. Some of these are given below:

- Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OSPE), Objective Structured Long Examination Record(OSLER)

These methods give the faculty the flexibility of testing the knowledge skill and attitude of the students towards any given scenario. This is usually a time-based evaluation. OSCE and OSPE are used these days in a number of allied and healthcare courses, e.g. optometry, physiotherapy and radiography. It tests the performance and competence in communication, clinical examination and medical procedures/ prescriptions. It uses observation check lists or rating scales for scoring to emphasize on frequent assessment of learning outcomes. This provides a feedback to the students as where they lack and gives an opportunity for improvement unlike the traditional method. This OSCE and OSPE can be used to assess clinical skills and also the knowledge any given process. For example, in case of subjective refraction, with OSCE the student has to perform the technique over a subject and in the next station he has to respond to the questions on subjective refraction. This gives the faculty on the level of knowledge the student has on subjective refraction.

This process needs a lot of time and support from the faculty members. The stations are fixed according to the number of students to be assessed. The response station (Knowledge Assessment) and the performance station (Skill Assessment) are planned and the equipment’s needed for the stations are arranged well ahead. The faculty or the examiners are placed at each station with the checklist for that particular station. This way the bias is eliminated. The OSCE and OSPE also have an advantage of providing the feedback to the students at the end of the assessment. The response station answers are also displayed to the students so that they get to know the answers.

- Short case evaluation

Evaluating the students with short clinical scenario will help us know their analytical ability. The case can be given to students and assessment on the management process is done. This gives the holistic approach on any type of cases. For example, a case on presbyopia can be given to the student and the processes of providing addition lenses along with his refraction skills are assessed. His ability to relate the visual demand and the need of the patient can be assessed by this process.

- Rubrics-based assessment

A rubric is a “scoring tool that lays out the expectations for an assignment.” “Rubrics generally have 4 parts: (1) description of the task, (2) the scale to be used, (3) the dimensions of the task, and (4) the description of each dimension on the scale.” Established competency standards are used as performance criteria and indicators are planned for students to know where they stand. This system gives
the feedback and also provides information on the gaps. The students know from the descriptors their goal and strive hard to achieve it.

- **Case-based discussion (CBD)**
  This is a part of theoretical and practical assessment. Cases can be simulated and the students are asked to discuss about the cases. The faculty facilitate about the case and analyse the thought process of the students.

- **Portfolio**
  Creating students portfolio is a new technique. All the students’ assessment and performance throughout the year is recorded and provided to the student. This gives the track of their performance and also guides the faculty to know the level of training to be given to that particular student.

**WHAT NEXT?**
The above-mentioned techniques are practiced in few colleges and institutes. Now let us see the emerging trends in education to enhance the teaching and learning technique with the use of technology.

- **Technology-based online learning**
  The use of learning management system in the curriculum will help to facilitate the online learning. Many on campus and also off campus distance education programs take the course management system such as Moodle for their programs.9,10 These systems save time and make the course materials available to the students for ready reference. The advantages of these online systems are the students need not come to regular classroom sessions. They can fix time with the faculty members for any contact sessions if needed. This gives more flexibility to the students for their time management.

- **Blended learning**
  Blended learning is a hybrid of online and face-to-face teaching.3,11 The students get to access the online teaching modules and also lecture by the faculty. This technology enhances teaching and also increases interaction between faculty and students. The online system provides the platform for the students to learn on the techniques or the course in a better way. They can access the material at any point of time. Goodwin et al. reported that blended learning allowed for more flexibility in that the students could do the assignments at any time of the day. It allowed more active student involvement. He also added that optometric faculty need to meet the expectations of the students while delivering difficult material in an effective way. Thus there is a scope of blended learning to be introduced in the curriculum for effective learning process by the students.

- **Evidence-based practice**
  The process of evidence-based practice (EBP) is based on the pre-requisite that clinicians acquire, locate, evaluate and apply relevant high-quality medical information to a clinical question. EBP4,12 should comprise collection, interpretation and integration of valid and applicable patient-oriented, clinician-controlled and research-derived knowledge (evidence). Still further, the best available evidence is “brushed up” by patient circumstances and, in particular, preferences to be finally applied to improve the quality of clinical decision-making and facilitate cost-effective care.

- **Simulators for clinical skills**
  Simulators can be of use in teaching the clinical skills to the students. Instead of practicing on to each other, the simulator training would be more beneficial. This has been a proven method in medicine on the surgical skills. Father of Surgery Susrutha,13 the ancient Indian physician, taught the surgical skills to his students on various experimental modules, for instance, incision on vegetables (like watermelon, gourd, cucumber etc.), probing on worm eaten wood, and preceding present day workshops by more than 2600 years. Thus simulators for teaching skills like retinoscopy or fundus evaluation can enhance the education.

**Conclusion**
As said in the beginning, let us come out of old to start the new. Let us adopt the new modes of teaching and with the lessons from the new modes, create further innovative models. The faculty members of schools of optometry can initiate the innovative models in their classes and make learning process as an easy task to students.

**REFERENCES**