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IELA AWARD WINNER

eLearning Strategies to Enhance Eye Care Training

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ABSTRACT

Myopia prevalence in Asia remains among the highest globally, accompanied by widespread misconceptions about its management. For eye care practitioners, staying updated on emerging research and debunking myths is critical to delivering effective patient care. However, traditional approaches to professional development, such as in-person workshops or online modules, often fail to account for the time constraints and demanding schedules of practitioners. Effective learning strategies must go beyond mere knowledge delivery to address the behavioral and motivational challenges that impact the application of knowledge in real-world settings. This paper explores an award-winning eLearning initiative by the Singapore National Eye Centre designed to advance professional development in basic myopia management. By leveraging innovative online learning strategies, this project equips practitioners with evidence-based insights while fostering meaningful behavioral change. The program's design aligns with the evolving demands of healthcare education, emphasizing practical application, adaptability, and outcomes-driven learning. In the context of a rapidly changing healthcare landscape, this initiative demonstrates how well-structured eLearning can empower practitioners to navigate complex research, dispel prevalent myths, and ultimately improve patient care.

KEYWORDS

myopia management, healthcare education, evidence-based, eye care practitioners, professional development, continuous learning, knowledge delivery, behavioral change, online learning strategies, eLearning, Singapore National Eye Centre

1 INTRODUCTION

The prevalence of myopia in Asia is among the highest globally [1], numerous misconceptions persist. As new findings continue to emerge alongside these prevailing myths, it has become increasingly crucial for eye care practitioners to stay updated and continuously upskill their knowledge to provide the best possible care.

While organizations often respond to these challenges by implementing more training, increasing the quantity of training is unlikely to drive meaningful change. Formal education—in-person workshops, online modules, or on-demand resources—is crucial for equipping practitioners with updated knowledge, but this

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requires time for busy practitioners who often struggle to find it. With demanding schedules and patient care responsibilities, dedicating time for continuous learning can be challenging [2]. Effective learning strategies must address not just the acquisition of information but also the motivations, constraints, and accountability of those involved in managing myopia.

This distinction between knowledge delivery and behavior change is particularly relevant when it comes to training eye care professionals in managing basic myopia [3], a condition that requires consistent and accurate intervention strategies. Unlike learning in purely academic settings, where the focus is often on knowledge retention, professional development in healthcare must be tightly aligned with improving patient outcomes and ensuring the application of knowledge in real-world scenarios.

This paper focuses on an award-winning project and how its well-designed eLearning, in the context of basic myopia management, can help eye care practitioners navigate the complexities of current research while dispelling prevalent myths about eye care treatment. Continuing professional development is essential in a field where both medical advancements and misinformation are rapidly evolving [4]. Following the growing adoption of online learning accelerated by the Covid-19 pandemic, this paper emphasizes the design of the learning experience that the Singapore National Eye Centre has implemented in an attempt to educate practitioners in their professional development.

2 LEARNING DESIGN

The design and development of the myopia management learning intervention followed a structured process framework around four key stages: Diagnosis, Co-create, Implement, and Evaluate (DCIE). This process was tailored to address the specific needs of eye care practitioners across various roles and settings.

3 DIAGNOSIS

The first step involved a comprehensive needs analysis to identify the knowledge gaps, challenges, and learning objectives relevant to myopia management within the target audience [5]. Data collection methods included surveys, focus groups, and interviews with stakeholders such as optometrists, ophthalmic assistants, and other eye care professionals. This diagnosis phase helped uncover the prevalent myths, misconceptions, and barriers that practitioners face in applying updated evidence-based practices. The insights gathered were instrumental in shaping the learning objectives and content of the intervention.

The discussion begins by arguing that any training strategy aimed at behavior change should first be grounded in a robust evaluation plan. We will then examine common barriers to effective myopia training, demonstrating that while education is an essential component, it is insufficient on its own. The paper will conclude by outlining evidence-based instructional design principles that can be applied across different learning platforms, with specific recommendations for optimizing eLearning in the context of basic myopia training.

4 CO-CREATE

The development phase was highly collaborative, involving subject matter experts, instructional designers, and key stakeholders from the eye care industry.

The co-creation process ensured that the learning content was both scientifically accurate and contextually relevant to the practitioners [6]. The design incorporated adult learning principles, focusing on practical application, active learning, and scenario-based exercises (see Figures 1–6). Additionally, the content was structured to be modular, allowing learners to engage with it in manageable segments (see Figure 7). This phase also involved pilot-testing the materials with a small group of practitioners to gather feedback and make iterative improvements.

5 IMPLEMENT

The implementation phase focused on delivering the learning intervention through multiple channels, including synchronous virtual classrooms and self-paced eLearning modules. To ensure accessibility and engagement, the program was made available on a flexible learning management system (LMS), Blackboard®, that allowed practitioners to learn at their own pace. In addition to offering online discussion forums (see Figure 8), synchronous web conferences were held at certain intervals so that participants could interact with subject matter experts through live discussions and practical exercises (see Figure 9). The implementation also included guided learning paths tailored to different levels of expertise (see Figure 1 below), ensuring that both new and experienced practitioners benefited from the program while allowing for stackable credentials towards higher professional qualifications.

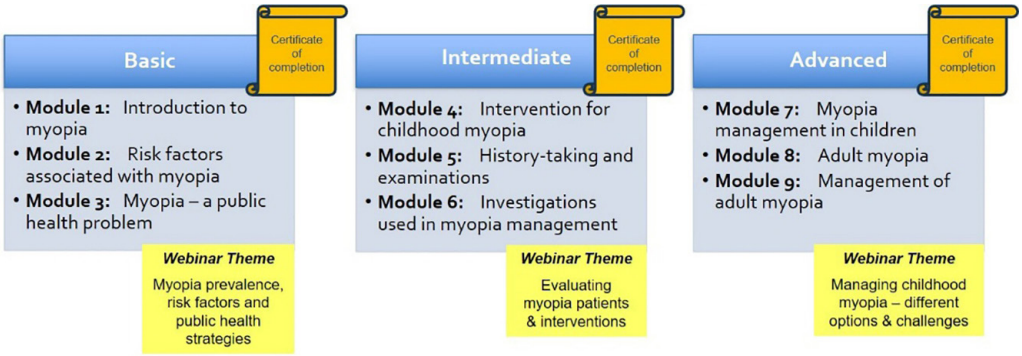


Fig. 1. Course was specially crafted into basic, intermediate and advanced sections. This structured and comprehensive approach allows all learners to build a strong foundation of understanding before augmenting their knowledge with subsequent modules, suiting varying needs

6 EVALUATE

Evaluation was an ongoing process conducted at multiple stages: before, during, and after the implementation of the learning intervention. A mixed-methods approach was used to measure the effectiveness of the program. Quantitative data was collected through pre-and post-assessments (see Figure 10), tracking improvements in knowledge and skills related to myopia management. Qualitative feedback was gathered through participant surveys (see Figure 11) and focus group discussions to assess engagement, relevance, and practical application of the content. The evaluation results provided valuable insights that informed future iterations of the learning intervention, ensuring continuous improvement and alignment with industry needs.

7 IMPLEMENTATION AND EVALUATION

A blended learning intervention was adopted [7], integrating synchronous virtual sessions, asynchronous eLearning modules, and interactive webinars. The implementation phase was carefully structured to accommodate different learning preferences, allowing eye care practitioners to engage with the content at their own pace while still participating in peer-to-peer guided discussions monitored by the subject experts. The rollout involved multiple cohorts, segmented into sponsored learners, internal staff, and self-paid participants from local and overseas countries.

8 PARTICIPANT ENGAGEMENT AND COMPLETION RATES

A total of 187 internal learners participated, with a 60.96% completion rate. Additionally, all sponsored and self-paid learners completed the modules.

Feedback from learners highlighted the course's smooth flow and comprehensive content. However, some challenges were noted, including the cumbersome two-factor authentication to access the learning platform, difficulties navigating the online platform, and issues with video loading speeds.

9 CONTENT DESIGN AND DELIVERY

Participants appreciated the interactive design and structured learning paths, though they suggested further improvements, such as the inclusion of more layman-friendly terms, enhanced visual aids, and the option to download course materials in PDF format for offline access. Due to the need to meet continuing professional education points requirements determined by professional accreditation bodies, the content resources also included a series of quizzes, case studies, and real-world scenarios to reinforce learning outcomes, practical application, and evaluation of learning against set benchmarks.

10 EVALUATION

The evaluation phase involved both quantitative and qualitative methods, conducted at various stages of the intervention to gauge effectiveness and inform future iterations.

Pre- and post-assessments were used to measure knowledge improvement. Results showed a marked increase in participants' understanding of basic myopia management concepts. For instance, a significant shift was observed in the post-assessment scores, with most participants advancing from basic to more proficient levels of comprehension.

Feedback was gathered from multiple sources, including surveys, focus groups, and webinar evaluations. Participants valued the diverse perspectives shared by experts during webinars but recommended more structured formats to enhance the clarity of key messages. Suggestions for future improvement included introducing more quizzes, enhancing video content, and offering additional case studies focused on everyday clinical practice.

11 DISCUSSION

The eLearning initiative described in this paper highlights the importance of a learner-centric approach in professional development, especially in healthcare settings where accurate knowledge application is critical. By following the DCIE process, the learning program was able to address the specific needs of eye care practitioners, bridging the gap between theoretical knowledge and practical implementation.

The results from both qualitative and quantitative evaluations indicate that while participants experienced significant knowledge gains, successful learning outcomes extend beyond content comprehension. The integration of interactive elements, scenario-based exercises, and collaborative discussions were crucial in fostering deeper engagement and ensuring that the learning translated into improved patient care practices.

However, the challenges reported—such as navigation difficulties and content accessibility—underscore the need for ongoing refinement and adaptability in digital learning solutions. These insights are critical as the industry increasingly shifts towards remote and hybrid learning models, especially in the post-pandemic landscape.

In the context of myopia management, where misconceptions and outdated practices can adversely affect patient outcomes, targeted eLearning programs provide an effective solution. The content's modular structure enabled participants to focus on areas most relevant to their roles while remaining up to date with the latest research. Moreover, offering flexible learning options, such as asynchronous modules complemented by synchronous expert discussions, was particularly effective in catering to busy practitioners' different learning preferences and time constraints.

12 CONCLUSION

This paper demonstrates that a well-designed eLearning intervention can significantly enhance the professional development of eye care practitioners by providing up-to-date, evidence-based training on basic myopia management. The DCIE framework allowed for a structured, needs-driven approach addressing content delivery and behavioral change.

Key takeaways from this project include the necessity of co-creating content with subject matter experts and end users to ensure relevance, the value of integrating diverse instructional strategies to accommodate different learning preferences, and the importance of continuous evaluation for iterative improvement.

The blended learning approach, incorporating both synchronous and asynchronous elements, proved effective in accommodating different learning preferences and time constraints. However, the challenges of content accessibility and platform navigation reveal areas for continuous improvement. The evolution of eLearning offers promising pathways to address these challenges.

As the healthcare sector continues to navigate rapid advancements and evolving patient needs, digital learning will play an increasingly vital role in ensuring practitioners remain competent and confident in their practice. To support this rapidly changing healthcare landscape, clinical organizations are evolving into—and should be supported as—the schools of the future, supporting continuous learning and training by enhancing learning and development capabilities. The Singapore National Eye Centre's experience in implementing this program offers valuable insights for similar organizations aiming to leverage eLearning for professional development in clinical

settings. Future work should focus on refining content accessibility, incorporating more clinical case studies, and exploring the use of emerging technologies, such as the use of AI-driven digital assistants, which could anticipate learning needs to create a more personalized and impactful learning experience.

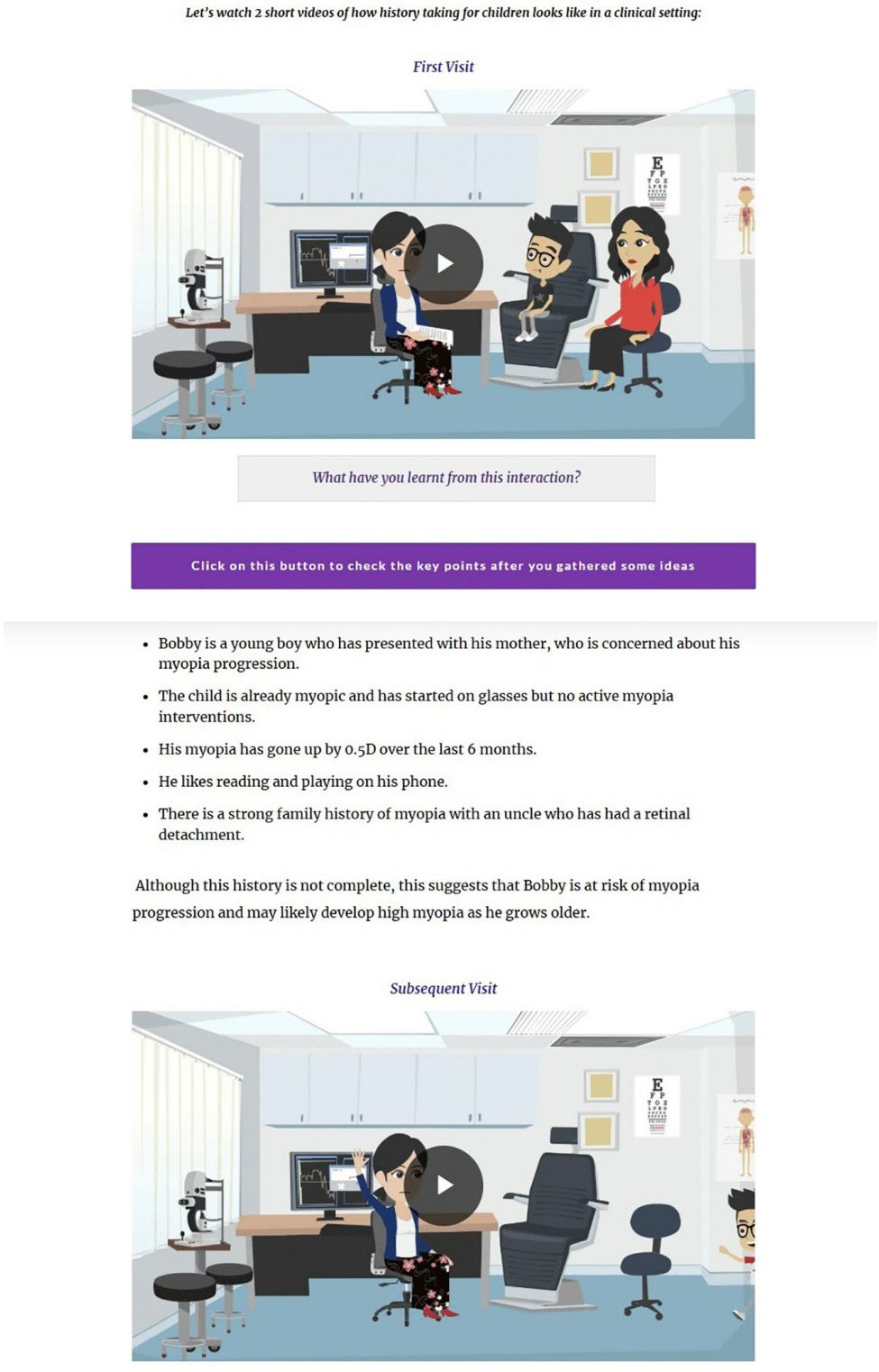
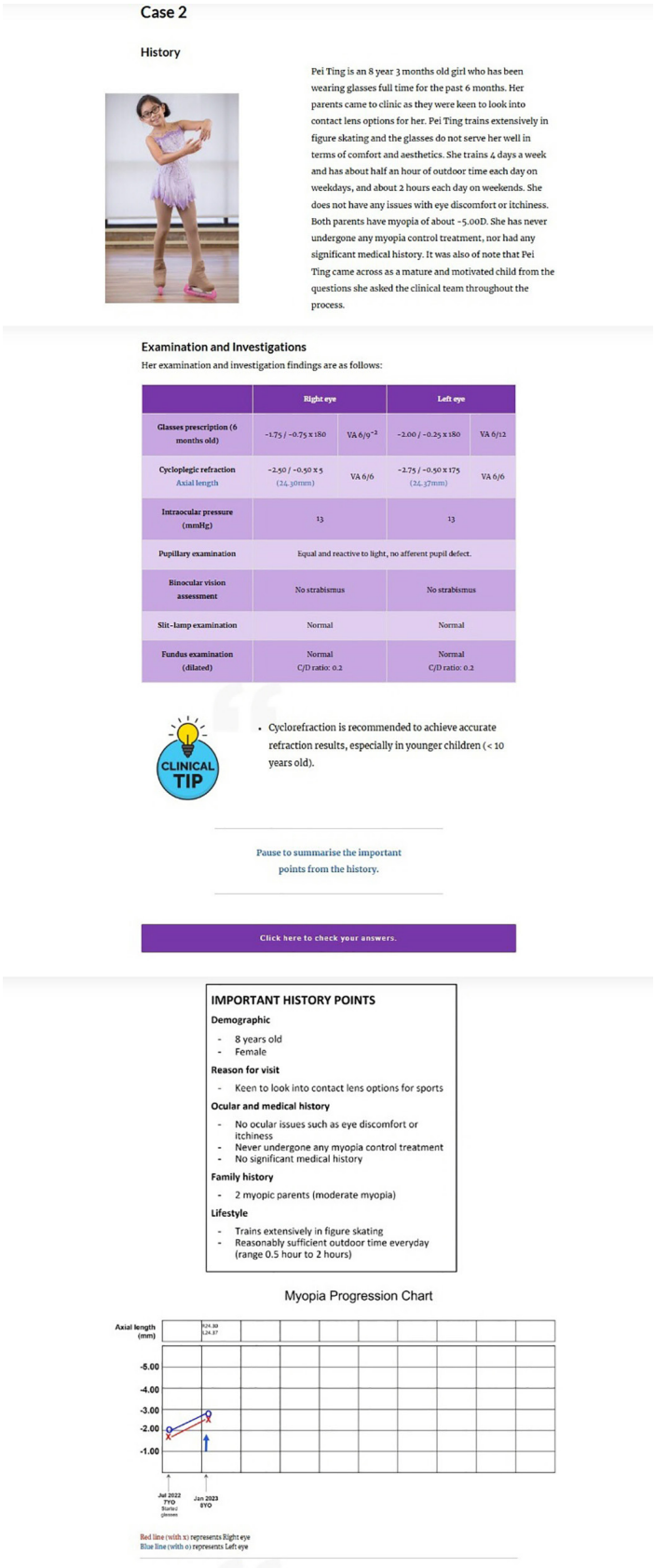


Fig. 2. Active learning with animated video, showing practical application of how to do history taking for children



Case 2

History

Pei Ting is an 8 year 3 months old girl who has been wearing glasses full time for the past 6 months. Her parents came to clinic as they were keen to look into contact lens options for her. Pei Ting trains extensively in figure skating and the glasses do not serve her well in terms of comfort and aesthetics. She trains 4 days a week and has about half an hour of outdoor time each day on weekdays, and about 2 hours each day on weekends. She does not have any issues with eye discomfort or itchiness. Both parents have myopia of about -5.00D. She has never undergone any myopia control treatment, nor had any significant medical history. It was also of note that Pei Ting came across as a mature and motivated child from the questions she asked the clinical team throughout the process.

Examination and Investigations

Her examination and investigation findings are as follows:

	Right eye		Left eye	
Glasses prescription (6 months old)	-1.75 / -0.75 x 180	VA 6/9^{-2}	-2.00 / -0.25 x 180	VA 6/12
Cycloplegic refraction Axial length	-2.50 / -0.50 x 5 (24.30mm)	VA 6/6	-2.75 / -0.50 x 175 (24.37mm)	VA 6/6
Intraocular pressure (mmHg)	13		13	
Pupillary examination	Equal and reactive to light, no afferent pupil defect.			
Binocular vision assessment	No strabismus		No strabismus	
Slit-lamp examination	Normal		Normal	
Fundus examination (dilated)	Normal C/D ratio: 0.2		Normal C/D ratio: 0.2	

CLINICAL TIP

- Cyclorefraction is recommended to achieve accurate refraction results, especially in younger children (< 10 years old).

Pause to summarise the important points from the history.

Click here to check your answers.

IMPORTANT HISTORY POINTS

Demographic
- 8 years old
- Female

Reason for visit
- Keen to look into contact lens options for sports

Ocular and medical history
- No ocular issues such as eye discomfort or itchiness
- Never undergone any myopia control treatment
- No significant medical history

Family history
- 2 myopic parents (moderate myopia)

Lifestyle
- Trains extensively in figure skating
- Reasonably sufficient outdoor time everyday (range 0.5 hour to 2 hours)

Myopia Progression Chart

Fig. 3. A patient case with examination data is provided for scenario-based learning. Learners are prompted to identify important information from the given case history before they click to check their answers and learn from what they might have missed out

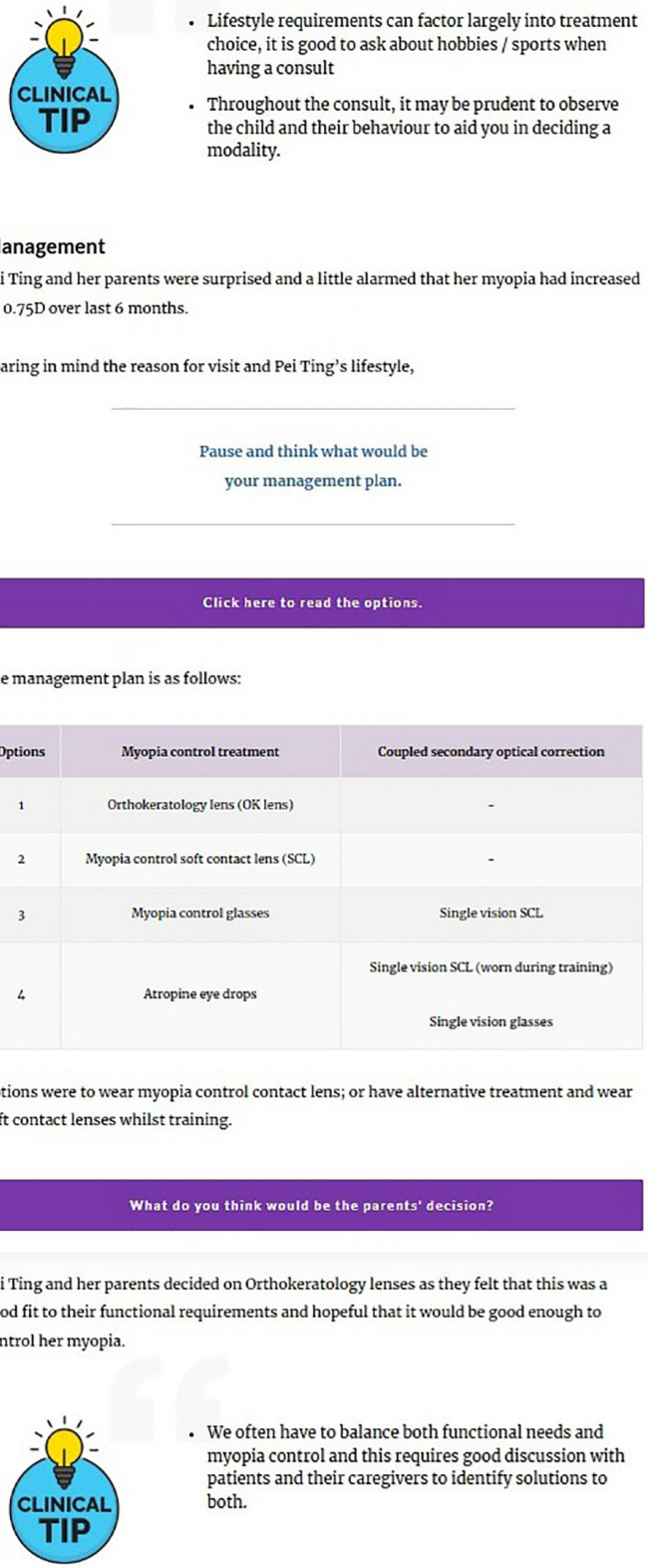


Fig. 4. Useful clinical tips are provided along the way as new knowledge and for learners to apply and put into practice in their work, if relevant. With all the provided information and data so far, learners are prompted to apply the theoretical knowledge they have learnt to setup some relevant management plans appropriate for the patient in this case scenario. They will then click to check their answers for progressing further

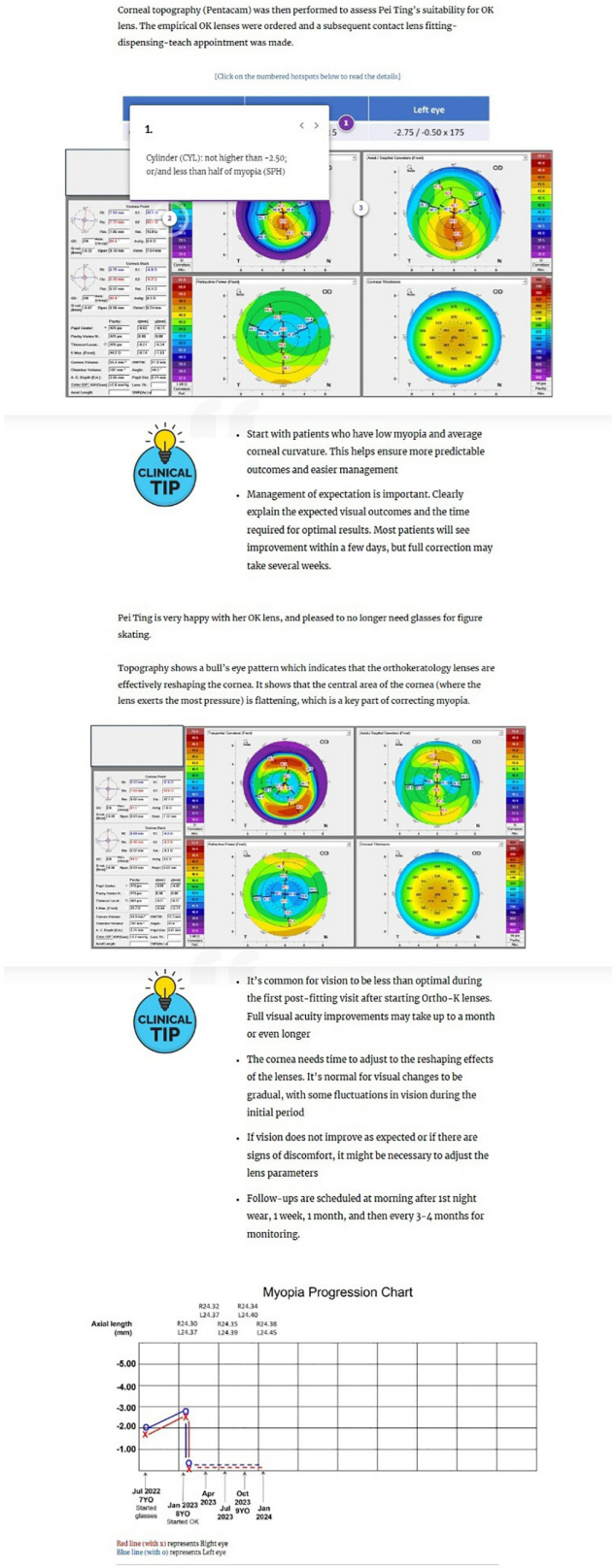


Fig. 5. When necessary, new knowledge is embedded in the case scenario for learners to pick up at the most appropriate part of the learning process. Here, learners interact with the corneal topography to learn how to interpret the results. Patient's progression chart over a period of consultation is shown to help learners determine if the management plan is working and if there is a need to revise the plan

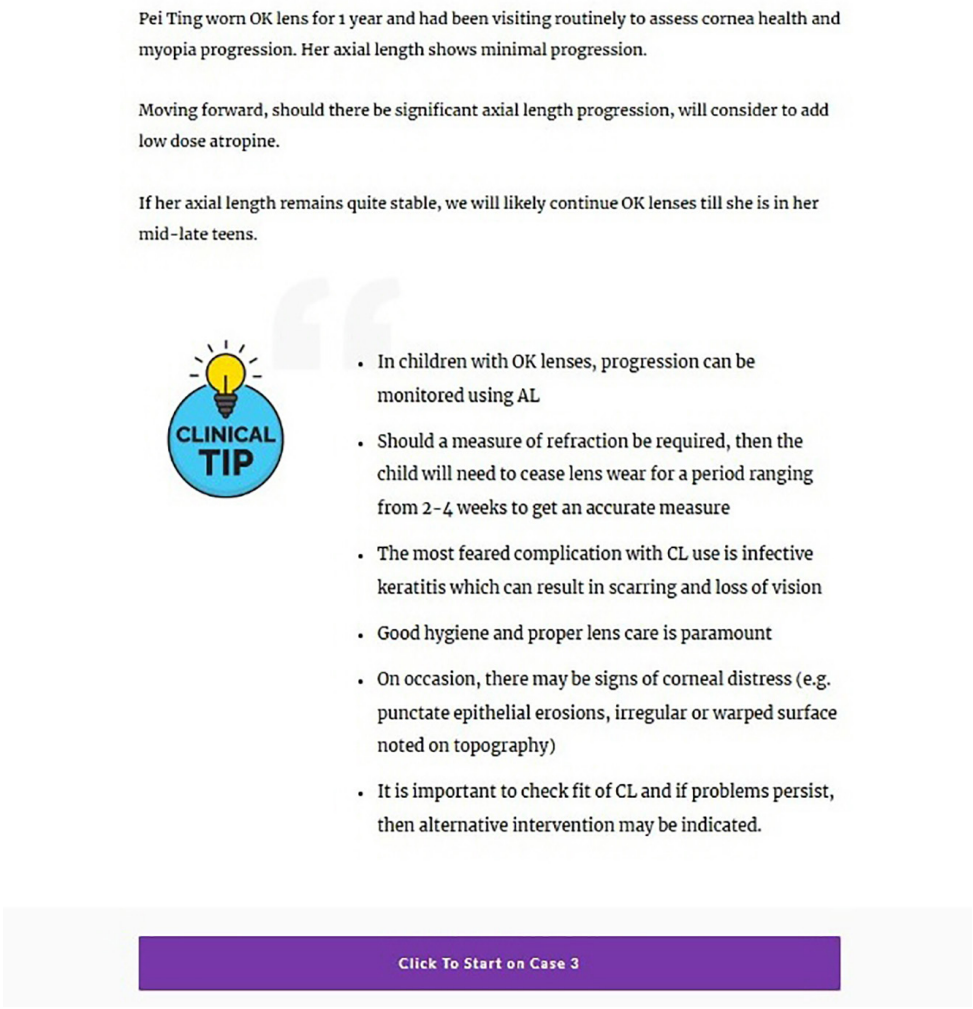


Fig. 6. A summary of the case scenario is provided at the end for learners to understand how patient will continue with treatment

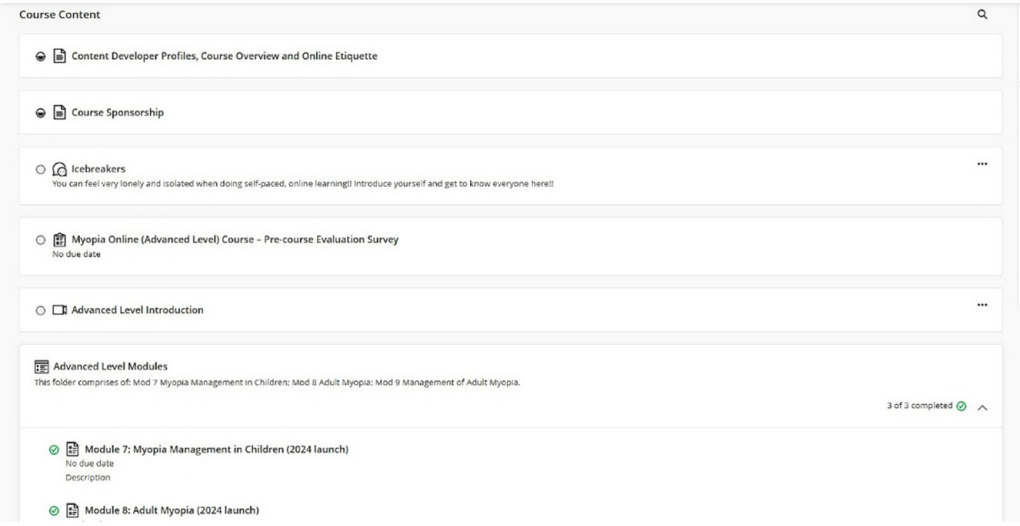


Fig. 7. Course is hosted on the Blackboard® learning management system (LMS) and setup in a simple and clear course structure for easy navigation with the content chunked into modular and manageable learning segment to fit busy schedules

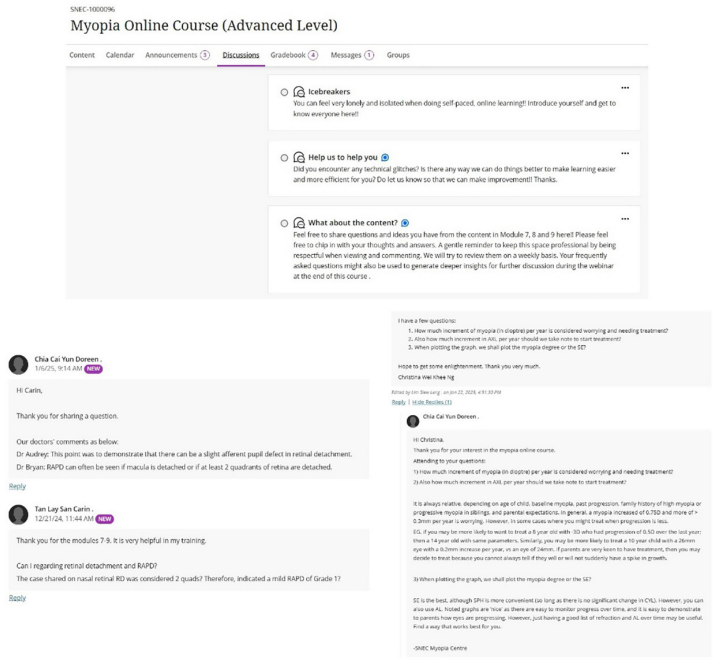


Fig. 8. Online discussion forums with sample questions from learners and answers from doctors

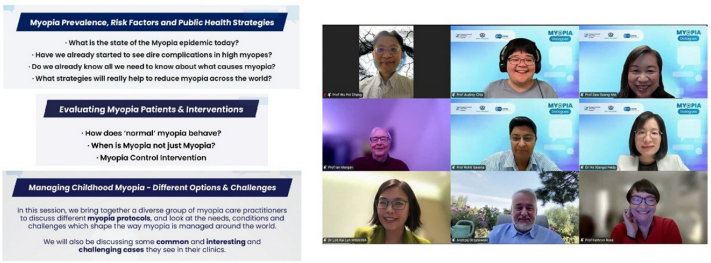


Fig. 9. Synchronous and engaging web conferences held at end of each course level. Had invited renowned panelists from around the world including Australia, China, India, Ireland, Netherlands, Poland, Singapore and Taiwan

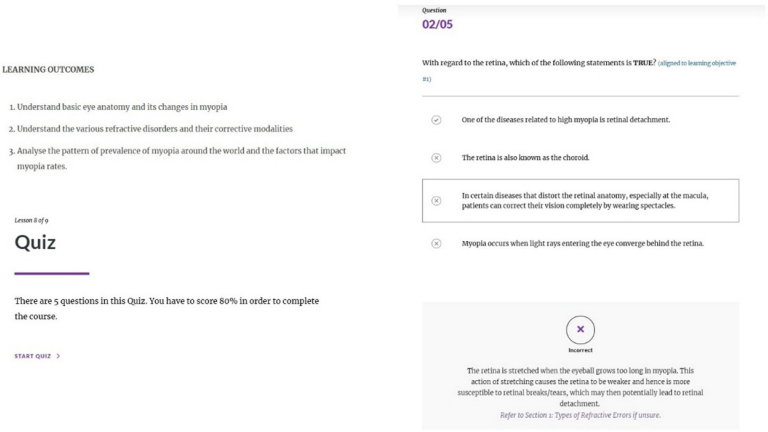
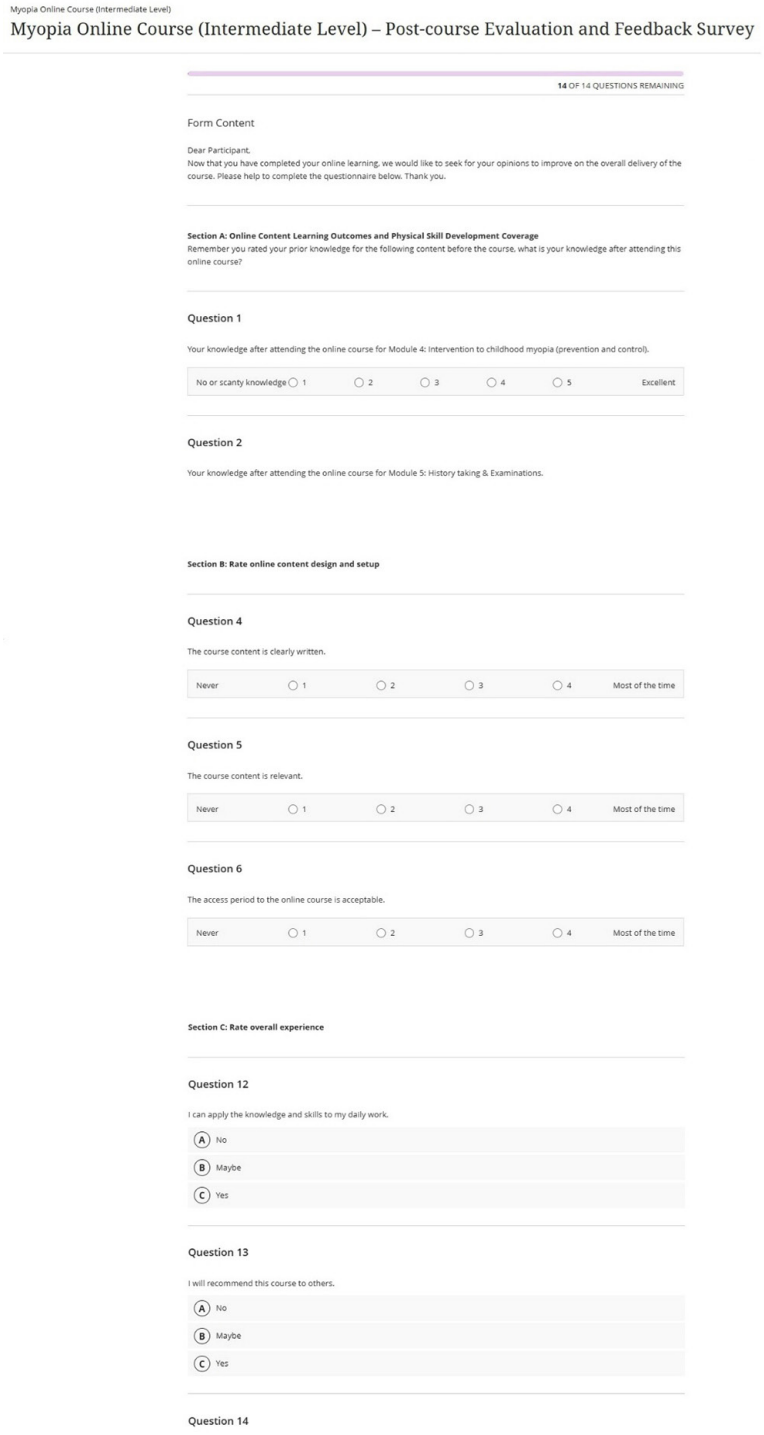


Fig. 10. Module quizzes to track understanding and improvements in knowledge and skills. Quiz questions are constructively aligned to address every learning outcome stated. Feedback is provided upon submission of answer to facilitate learning. The quiz scores also determine the meeting of passing requirement towards attainment of a certificate of completion which can be submitted to professional boards for CPD points


Myopia Online Course (Intermediate Level)

Myopia Online Course (Intermediate Level) – Post-course Evaluation and Feedback Survey

14 OF 14 QUESTIONS REMAINING

Form Content

Dear Participant,
Now that you have completed your online learning, we would like to seek for your opinions to improve on the overall delivery of the course. Please help to complete the questionnaire below. Thank you.

Section A: Online Content Learning Outcomes and Physical Skill Development Coverage
Remember you rated your prior knowledge for the following content before the course, what is your knowledge after attending this online course?

Question 1

Your knowledge after attending the online course for Module 4: Intervention to childhood myopia (prevention and control).

No or scanty knowledge ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 Excellent

Question 2

Your knowledge after attending the online course for Module 5: History taking & Examinations.

Section B: Rate online content design and setup

Question 4

The course content is clearly written.

Never ○ 1 ○ 2 ○ 3 ○ 4 Most of the time

Question 5

The course content is relevant.

Never ○ 1 ○ 2 ○ 3 ○ 4 Most of the time

Question 6

The access period to the online course is acceptable.

Never ○ 1 ○ 2 ○ 3 ○ 4 Most of the time

Section C: Rate overall experience

Question 12

I can apply the knowledge and skills to my daily work.

(A) No
(B) Maybe
(C) Yes

Question 13

I will recommend this course to others.

(A) No
(B) Maybe
(C) Yes

Question 14

Fig. 11. Surveys to gather feedback to improve future iterations of the course specifically in the area covering content and skill, online content design and setup, and overall learning experience

13 ACKNOWLEDGEMENT

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