

A systematic approach to learning design for supervisor training in Ophthalmology Education

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Specialist medical education aims to develop clinical knowledge in conjunction with professional attributes such as communication skills, collaboration, health advocacy, management, and professionalism. RANZCO is undertaking a 3-year curriculum redesign plan that incorporated feedback received from the Australian Medical Council and is moving towards a systematic approach to supervisor and trainee teaching and learning interventions to improve the quality of the learning experience. In parallel to the new curriculum, the college has established the Digital Learning Transformation initiative by developing theoretical frameworks to guide a systematic approach to learning design. The frameworks informed the design, implementation, and evaluation of interactive modules to support supervisors in educational topics. This concise paper aims to present the theoretical underpinning and the *Modus Operandi* of the intervention. The authors hope this initiative could inspire other medical colleges to take an evidence-based educational approach to supervisor training.

Keywords: Medical education, supervisor training, learning design, evidence-based education.

Introduction

RANZCO is undertaking a curriculum review to address the feedback received from the Australian Medical Council (AMC) and implement a trainee-centred approach (Johnson, Owens & O’Neil, 2019). The AMC feedback included strengthened the professional capabilities, cultural safety and provide training in evidence-based medical education for supervisors. As a result, an updated version of the Vocational Training Program (VTP) curriculum includes four domains: foundation skills and knowledge, clinical, procedural, and professional. The objective of the VTP program is to produce a specialist ophthalmologist who, on completion of training, is equipped to undertake safe, independent, comprehensive, general ophthalmology practice. The VTP curriculum document outlines several components: general ophthalmology competencies, domain learning outcomes, an overview of domain content, learning and teaching approaches, assessments, and evaluation and monitoring. This new iteration of the curriculum strengthened the professional domain as it underpins all critical knowledge, skills and behaviours required to provide outstanding care for patients (Frank & Danoff, 2009). In addition, it focuses on cultural safety practices, advocacy and sustainability, leadership and management, and ethical frameworks in clinical practice.

The next step is implementing the new VTP curriculum to prepare supervisors to cater to trainee needs. Preparing trainees to undertake safe, independent, and comprehensive approaches to specialist medical education will require supervisors equipped with the latest evidence-based principles of medical education (Joshi, 2021). These principles are basic knowledge in learning theories, teaching strategies, assessing learning, and providing feedback. The supervisor training will require a systematic approach underpinned by theoretical frameworks strengthened by evaluation and improvement. This paper aims to present these theoretical frameworks and their application to design the supervisor training program.

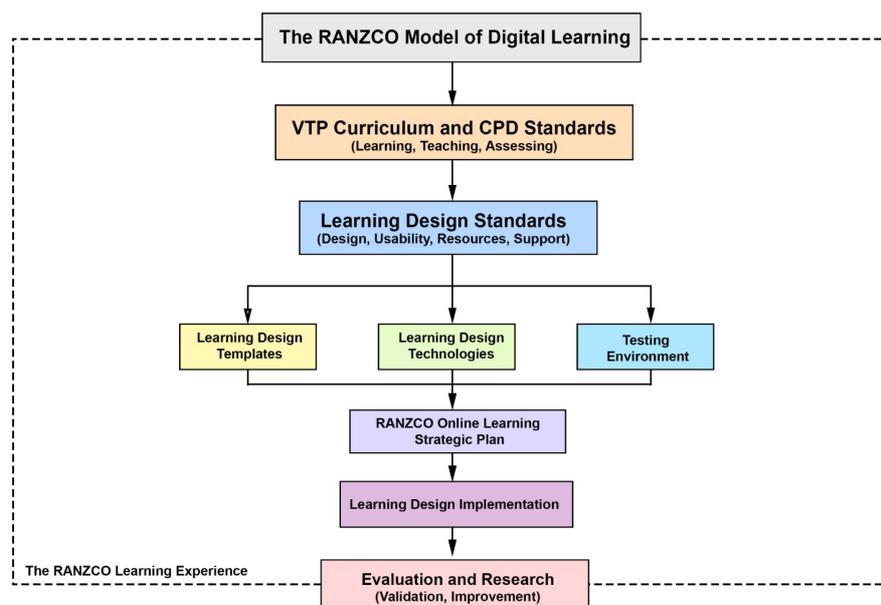
Development of Conceptual Frameworks

The following section presents the theoretical frameworks developed by the college that underpin the development of the supervisor training program. These frameworks are evidence-based as they incorporate the latest research and practices in medical education.

Supervisor and Trainee Framework

The starting point of the intervention was to develop the [Supervisor and Trainee Framework](#) to identify the elements that will inform the development of a set of standards. This framework guided the content for interactive modules for supervisors. It was essential to develop the RANZCO Digital Learning Transformation Project (Figure 1), an evidence-based workflow from the learning design perspective to guide the supervisor and trainee learning experience. This workflow comprises the [Model of Digital Learning](#), the [Basic Standards for Online Learning](#), and the [Learning Design Templates](#). Having these evidence-based frameworks helped to establish a systematic approach to supervisor training.

Figure 1: The RANZCO digital learning transformation project



An excellent clinical supervisor is a trainee-centred facilitator who is enthusiastic, encourages the development and refinement of trainee skills, and provides timely and constructive feedback (NHS Education for Scotland, 2019). A supervisor able to support learning in line with their scope of practice will enable the trainee to develop their competence and meet program outcomes (Kilminster, Cottrell, Grant & Jolly, 2007). A clinical supervisor should be comfortable raising and responding to trainee conduct and competence concerns and providing strategies to overcome difficulties the trainee is experiencing.

The *Supervisor and Trainee Framework* developed outlines six key elements that shape a productive learning environment such as (i) medical knowledge; (ii) teaching and learning; (iii) communication skills; (iv) cultural safety; (v) ethical and professional, and (vi) monitoring and reflection. Each element has a set of standards expressed as learning outcomes. The quality of training received by the trainee and the skills they develop will be the measurable outcome of the standards. For instance, creating an online module for supervisors to engage in effective feedback will embed all these elements by contextualising the topic to real-life clinical settings.

Model of Digital Learning

The [Model of Digital Learning](#) is a critical component of the RANZCO blended learning initiative that provides online resources to complement face-to-face learning in clinical settings. The model has eight core principles that comprise the philosophy behind the development of learning materials. These principles align with the VTP curriculum (Table 1).

Table 1. The core elements of the Model of Digital Learning

Element	Description
Proven educational practices with a learner-centred approach	Uses an evidence-based approach to personalise learning and develop and extend knowledge, skills and behaviours required to undertake safe, unsupervised clinical practice as a general practitioner (Sternschein, Hayes, & Ramani, 2020).
Continuous assessment	Supports a programmatic assessment approach for trainees, including low and

and feedback	high stakes assessments and timely and meaningful feedback. For trainees, their assessments will be used to analyse their performance, inform their continuing development, remediation (if required) and progression decisions (Misra, Iobst, Hauer, & Holmboe, 2021).
Technology-enhanced learning, flexible and authentic	Uses innovative technologies, principles, and real-life situations to deliver enhanced, self-paced, authentic learning experiences which require trainees to engage and interact with content, learning, other trainees, themselves, and the technology (Goh, 2016).
Embraces cultural safety	Considers cultural safety, cultural knowledge, cultural skills, cultural encounters, and cultural desire and develops trainees' capabilities to deliver culturally safe treatments. Cultural safety embraces a patient-centred approach and creates a safe working environment for everyone (Kurtz et al., 2018).
Engages with the needs of society	Develops an understanding of society's current medical needs and trainees' responsibilities to provide patient-centred care, which has positive outcomes for patients, their families, and their communities (Mirzaei et al., 2013).
Promotes professional, ethical, and reflective practices	Requires adherence to professional and ethical practice (codes, regulations, protocols, behaviours, attitudes) and critical reflection on experiences to continually refine and improve clinical practice (Daryazadeh, Yamani, & Adibi, 2020).
Promotes research and innovation	Develops trainees' capabilities to undertake and apply research and innovations to improve the provision of patient care (Nania et al., 2021).
Continual improvement through evaluation and research	Evaluation is a reflective and ongoing process that gathers multiple data sets from trainees to identify ways to enhance digital learning experiences. The research aims to generate new knowledge which is shared with the medical education community to improve digital education practices (Akdemir, Peterson, Campbell, & Scheele, 2020).

Learning Design Standards

The [learning design standards](#) (design, usability, resources, and support) ensure that the online content delivery is pedagogical (Pasarica, Kay, & Cameron, 2019) and instructionally sound (Fatima, Naz, Zafar, Fatima, & Khan, 2020), visually appealing (Malamed, 2015), and that it embeds universal design, usability and accessibility principles. It uses multimedia learning principles such as Segmentation, Redundancy, Split Attention, Modality and Personalisation (Mayer, 2008) to ensure the best learning experience for trainees. The standards will assist in creating a consistent identity and online presence that follows the *Model of Digital Learning* (Table 1), including visual design guidelines which convey professionalism and credibility. These guidelines aim to standardise learning design and the look and feel of the content and learning modules developed.

Learning Design Templates

The [Learning Design Templates](#) mirror clinical scenarios using Case-Based Learning (CBL) approaches to guide supervisor and trainee modules. CBL is a standard teaching tool in medical education and uses real cases to help learners connect theory with practice (Ali et al., 2018). There is strong evidence in the literature that CBL enhances clinical knowledge, teamwork, clinical skills, practice behaviours, and patient outcomes (McLean, 2016). The templates were designed based on the VTP Curriculum outcomes. They included culturally diverse patients, such as Aboriginal and Torres Strait Islander peoples in Australia and Maori and Pacific peoples in New Zealand. The templates also incorporated the three characteristics of good learning design: (i) learning is active; (ii) activities are presented in a stepwise progression and (iii) the template is reusable (Britain, 2007). Trainees will have the opportunity to engage in immersive learning activities that will provide automatised expert feedback and assess their knowledge using higher-order thinking multiple-choice questions. Learning design templates include the knowledge and skills template and the non-surgical and surgical scenario templates that follow a reviewed version of the World Health Organization Guide to Good Prescribing (Tichelaar, Richir, Garner, Hogerzeil, & de Vries, 2020). Each section of the templates is aligned with the VTP curriculum and the *Model of Digital Learning* (Table 1).

Supervisor Modules

As a result of the VTP curriculum upgrade and the supervisor and trainee framework, RANZCO identified the need to develop modules for supervisors on medical education that reflect the latest evidence-based practices in medicine. This initiative involved a systematic approach to online learning based on the college [Digital Learning Transformation initiative](#). This initiative comprises the [Model of Digital Learning](#), the [Basic Standards for Online Learning](#), and the [Learning Design Templates](#). The frameworks informed the design and deployment of supervisor modules.

The project goal was to develop essential online training modules for RANZCO supervisors focussing on the core principles of medical education (Table 2). The content for the modules addressed the six elements previously presented in the supervisor's framework and included measurable learning outcomes. The modules also align with the *Model of Digital Learning* (Table 1), specifically with: (i) proven educational practices with a learner-centred approach; (ii) technology-enhanced learning, flexible and authentic; (iii) engages with the needs of society, and (iv) promotes professional, ethical, and reflective practices. Upon module completion, supervisors will be able to claim their Continuous Professional Development (CPD) points. The modules content underwent a peer-review process by relevant academic educational experts.

Features of the modules include (i) authentic clinical scenarios; (ii) learning design sequence (concept, worked example, activity and feedback); (iii) table of contents to facilitate navigation; (iv) self-paced with the ability to bookmark sections; (v) ability to highlight and annotate content; (vi) responsive design according to the device (laptop, tablet or phone) and platform (Windows, Macintosh, Android and iOS), and (vii) PDF version of the module for printing.

Table 2. The supervisor training modules

Module	Description
M1: Introduction to Medical Education	This module built a solid understanding of learning theories and adult learning principles applied in contemporary medical education. It also covers basic principles of cognitive psychology such as memory, self-regulation, and motivation.
M2: Teaching in Medical Education	This module develops critical skills on evidence-based delivery practices such as Experiential Learning, Work-Based Learning, and small group teaching. The module also covers blended, flipped, mobile learning, simulation-based learning, social media learning, and study skills.
M3: Assessment in Medical Education	This module develops critical skills on principles, standards, instruments, and types of assessments. These theoretical concepts are essential to understand how the college designs trainees' assessment tasks to enhance their learning experience.
M4: Feedback in Medical Education	This module develops critical skills on evidence-based principles of timely, actionable, meaningful, and respectful feedback to trainees. In addition, they will find valuable tips to improve their practice as supervisors and apply their knowledge to engage with video scenarios about providing feedback in challenging situations.

RANZCO is undertaking a pilot evaluation using a mixed-methods evaluation approach to assess supervisor acceptance of the newly developed modules, evaluate the improvement in supervisors' knowledge related to the learning outcomes, and optimise their practice with trainees. The evaluation also aims to improve the modules in the subsequent iterations. The evaluation will consist of pre-and post-Multiple-Choice Questions (MCQs) and reflective activities embedded in critical parts of the module and a post-module online survey followed by semi-structured interviews. In addition, the study will utilise triangulation of data to provide credibility to the results. The supervisor modules are currently on a pilot before deployment across the networks.

Future Directions

This is the first time RANZCO has taken a systematic approach to learning design to improve online supervisor educational practices. The frameworks developed and applied to the supervisor training modules will be utilised in future learning design at the college. In addition, the authors hope that the online survey can be validated and used consistently when deploying new educational interventions to enhance the trainee learning experience. In the future, the college will design additional modules and consider implementing a micro-credential system and microlearning approach. The next step will be to engage trainees as partners in learning design by providing them with the opportunity to co-create course material. This paper articulates an evidence-based educational

approach to enhance the trainee learning experience. The authors hope this intervention could inspire other specialist medical colleges to support supervisor training and improve the trainee learning experience, leading to improved eye care in Australia and New Zealand.

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