Medical student reflections and learning from completing a clinical audit: Gains for the health system

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Abstract

Introduction: The exponential growth in healthcare knowledge, accreditation and professional development frameworks has increased an emphasis on quality assurance/improvement (QA/I). Today's medical practitioners lead and engage in the design and implementation of healthcare monitoring and QA/I initiatives. For undergraduate medical students, QA/I scholarly placements may have dual benefits. While teaching scholarly skills in an applied context, they simultaneously support healthcare services to complete clinical audits, monitoring progress towards meeting health service quality and safety targets. This study examined the role of QA/I scholarly concentrations (SC) in developing medical students' scholarly skills.

Methods: Data comprised written reflections focusing on students' experiences and learning. Of the 405 SC projects conducted to meet the requirements of the Monash medical program, clinical audits that met the inclusion criteria were completed by 20 final-year medical students. Qualitative content analysis was used to examine student experiences, specifically how students' knowledge, skills and attitudes towards scholarly work were influenced by undertaking a QA/I SC. A deliberate practice approach provided the theoretical framework for analysis.

Results: Six themes were identified: (1) appreciation for the role and significance of QA/I activities, (2) the multidisciplinary team context, (3) valuing documentation, (4) personal challenges and growth, (5) the role of literature reviews in evidence-based medicine and (6) student satisfaction. Students' understanding of the importance of clinical audits was improved and technical skills were acquired through receiving timely feedback.

Conclusion: QA/I SCs may provide opportunities for developing scholarly skills while embedding evidence-based practice, multidisciplinary collaboration and critical thinking to build the capacity of the medical workforce and inform clinical policy, guidelines and practice.

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Introduction

Health services require clinicians to have strong scholarly skills to enable them to translate the research evidence base into clinical practice (Curtis et al., 2017). Concurrently, national medical education standards in many countries internationally (Ahmed et al., 2022), including Australia (NHMRC, 2014), now require graduates to gain competencies in demonstrating leadership in the safety and quality realm. Scholarly placements or projects, i.e., "scholarly concentrations" (SCs) foster research attributes in medical students in authentic and immersive ways (Laidlaw et al., 2012). The implementation of SCs in medical degrees has increased in recent years (Cornett et al., 2021), however their duration, learning outcomes and assessments vary, as do their chronological place in the curriculum and the extent of students' autonomy in relation to the choice of topic (Bierer & Chen, 2010).

Evaluations of SCs have found them to be effective in improving student knowledge and competence in critiquing the literature, understanding the research process, academic writing (Bierer & Chen, 2010) and protocol development (Mullan et al., 2014). Students' SC experiences have also been associated with their subsequent interest and participation in future research endeavours (Devi et al., 2015), which is beneficial for promoting practitioner research with tangible clinical implications across the health industry.

Most of the literature on SCs focuses on students engaged in research projects (Bierer & Chen, 2010). SCs may also involve "non-research" placements, which can include non-research QA/I projects within healthcare settings, including clinical audits. A clinical audit can be defined as "a systematic review of aspects of clinical performance against explicit predetermined criteria, and the implementation of change when the results indicate standards aren't being met" (RACGP, 2023, para. 1). While researchers have found clinical audits used in isolation from a systems-based approach to quality improvement to be ineffective and expensive (Boyle & Keep, 2018), when used in conjunction with coordinated resources and effort to achieve structural reform, they can be an integral component of the quality improvement cycle.

There is a gap in the literature in relation to educational outcomes of clinical audits (Jones et al., 2015). Audits may be underutilised and undervalued by both students and academics due to the perception that despite using similar methods, audits are not preferred activities to teach research competencies.

Barriers to QA/I projects also arise due to sensitivities about reporting results that are unfavourable to health services, and the associated reputational risk. An Australian university investigating perceptions of medical graduates and their workplace supervisors highlighted the educational and clinical benefits of participation in clinical audits

(Chapman et al., 2015). Other studies have focused on improved patient-care outcomes (Davis et al., 2017; Mak & Miflin, 2012). However, with these exceptions, few papers report on the outcomes of medical students engaging in undergraduate clinical audit programs (Chapman et al., 2015; Mak & Miflin, 2012). We aimed to address this evidence gap.

Reflexivity is a means to understand the learning students gain from (in this case) Monash University Medical Program's 6-week SCs, called scholarly intensive placements. Facilitating opportunities for students to engage in reflection promotes reflexivity and supports development of student capacity for integration of new learning and critical thinking (Ng et al., 2015). Hence, student reflections were integrated as a form of assessment for this unit to challenge undergraduates to think critically about their own thinking and about the medical systems they were placed within (Dennison, 2023). Reflection not only promotes personal growth and enhances learning but also supports the development of "more adaptive, critical, dynamic, reflective orientations that can better withstand and flourish in complexity" (Ng et al., 2015, p. 465). Pioneered by Schön (2017), reflection both in action and on action facilitates learning and prepares practitioners for reflexive practice by developing the ability to think about their behaviour in the moment.

Written reflections provided students with an opportunity to externalise their thinking and, hence, elucidate their areas of learning. There has been limited research examining the learning derived from engagement in scholarly intensive placements using reflective writing, and this is a gap that our study seeks to address. Our research aim was, therefore, to identify student perceptions of the value of undertaking a QA/I SC and the impact on their scholarly knowledge, skills and attitudes, with a lens on how this learning might be transferred to clinical settings in the future.

Method

In this study, the reflective summaries of 20 students who completed their 6-week scholarly intensive placements through undertaking non-research QA/Is in 2021 were examined from March to June 2022 using qualitative content analysis. We utilised these reflections as an illuminating form of written data that is rarely used to examine learning experiences in SCs or QA/I projects. This decision was underpinned by a social constructivist theoretical orientation, which acknowledges the unique subjectivity of each individual and the ways in which social environments influence the generation of knowledge and experience (Burr, 2024). We aimed to address the following two research questions: (1) What are student perceptions of the value of undertaking a QA/I SC and the impact on their scholarly knowledge, skills and attitudes? (2) How do students anticipate this learning might be transferred to clinical settings in the future? The project was approved by Monash University Human Research Ethics Committee (Approval number: 22920).

Setting

At Monash University, the Doctor of Medicine degree includes as a compulsory 6-week, full-time SC (referred to as a scholarly intensive placement) in the final year. Eight learning outcomes are articulated and included in the unit (see Table 1) and are aligned with five assessment tasks: research methods modules, a student–supervisor learning agreement, a scholarly report, an oral presentation and a self-reflection report (see Figure 1). This unit forms part of the "science and scholarship" domain in the Australian medical schools' curriculum (NHMRC, 2014).

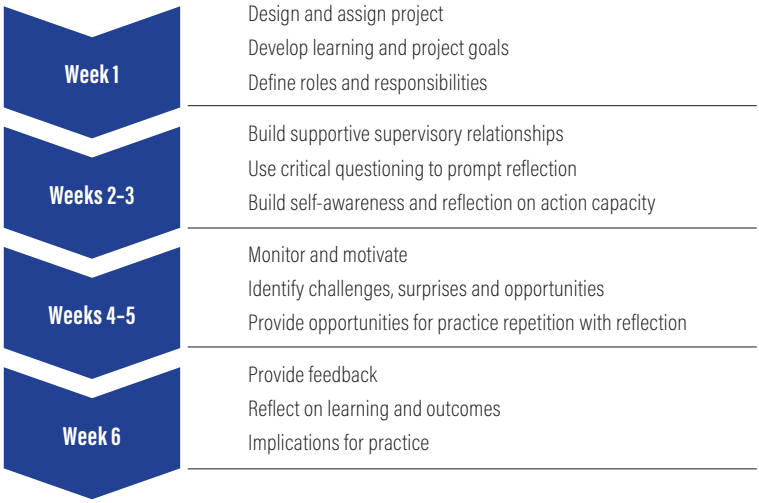
Table 1

Monash University Scholarly Intensive Project (SIP) Learning Objectives

	SIP Learning Objectives
1	Utilise specialist knowledge and skills to justify the need for a research, teaching or professional practice issue to be investigated or evaluated
2	Devise and implement a plan for the placement and identify key outcomes
3	Review, synthesise and critically appraise clinical and scientific literature in a specific area of medical science, education or professional practice
4	Practise and demonstrate an understanding of academic integrity, research integrity and ethical behaviour in the context of medical science and/or delivery of care
5	Collect and categorise information related to a key question relevant to the community and to medicine
6	Analyse and summarise information related to a key question to the community and to medicine
7	Justify approaches to solve a complex problem relevant to their placement
8	Communicate critical arguments or key concepts and findings to a professional audience in oral and written formats

Figure 1

Conceptual Framework for Monash University QA/I SCs



SC projects are classified as research or "non-research" and are offered across numerous metropolitan and rural teaching hospitals. Examples of non-research projects include clinical audits of discharge processes and antimicrobial stewardship.

Data source

Student self-reflection reports on completing "non-research" QA/I projects were purposefully selected as the data source for this study. From a total of 405 SC projects across the faculty, the purposive sample for this study included the reflections of all students who completed a clinical audit project. The students were required to respond to prompts such as: What was your biggest challenge during your scholarly intensive placement and why? What scholarly knowledge or skills did you acquire or improve upon through completion of the scholarly intensive placement? How (if at all) do you think your scholarly intensive placement experience will influence your future practice? Students were informed that their de-identified reflections may be used for research purposes, but this would only occur after final marks had been submitted.

Inclusion/exclusion

SC coordinators of each school were asked to identify the reflections of students who had completed a QA/I project within a healthcare setting. They did so by reviewing the SIP project titles and descriptions of each student within their cohort, downloading the reflections associated with that student and securely transferring them in electronic form to the research team. Projects were excluded if they were literature reviews or if they were education/professional development based without an evaluation or audit component.

Analysis

Content analysis was undertaken as a flexible inductive approach, which enables the generation of rich and complex interpretations that are grounded in the text (Kade & Wadsworth, 1989), i.e., the subjective reflections of SC students. The procedural steps included identification of QA/I projects by the SIP coordinators of each school, who selected only reflections that were based on projects pertaining to QI/A SC projects; reading and rereading de-identified reflections to gain familiarity; and initial coding, whereby researchers reviewed the data line by line and inductively allocated codes that captured the core meaning. This was followed by focused coding, which involved researchers comparing data and codes within and between the different reflections. Discussions between the researchers occurred during coding processes to facilitate the synthesis of results.

The data was examined through Schön's (2017) reflective practice framework. This was considered a congruent fit with the structure of the SC program, which embedded opportunities for critical self-reflection throughout the project, predominantly through reflection on action. This involved the medical school and/or health service supervisor designing a project with capacity for rich scholarly learning and the student engaging

in regular supervision sessions to reflect on their learning journey, progress towards meeting their learning goals and completion of tasks. In addition to the written reflection assessment, students were also required to deliver an oral presentation of their project to key stakeholders at their health service site. Responding to questions from the audience prompted reflection on learning, including decisions, opportunities, challenges, constraints and surprises encountered along the way. In terms of the data analysis, Schön's (2017) framework was applied as a deductive process following inductive coding. Examples of reflection on action and reflection in action were identified and their meaning considered through researcher dialogue.

Results

From analysis of the 20 included reflections across five schools within the faculty, six themes were generated: (1) appreciation for the role and significance of QA/I activities, (2) the multidisciplinary team context, (3) valuing documentation, (4) personal challenges and growth, (5) the role of literature reviews in evidence-based medicine and (6) student satisfaction. Overall, student reflections revealed that they gained an appreciation of numerous non-clinical elements of the healthcare system, acquired scholarly knowledge and skills and felt satisfaction with the learning experience.

Appreciation for the role and significance of QA/I activities

A new-found appreciation was articulated by students for the importance of undertaking QA/I practices, as "local audits are an important yet humble form of research for quality improvement and can help shed light [on] areas in need of attention" (P20). Students gained technical skills to undertake QA/I activities in the workplace, and problem-solving skills were required to manage the difficulties encountered in the real-world healthcare settings, such as delays in accessing health records and sensitive communication of unfavourable results:

> *I expected the results to be a lot better than they were, and so I found it very hard to write a report about a unit that probably wasn't functioning as optimally as they should be … with the registrars and consultants. … I was able to nut out where the unit was struggling as a whole, which in turn helped me write my discussion and provide suggestions as to how they may be able to improve their efficiency.* (P5)

Many students understood QA/I activities to be a core component of professional accountability and evidence-based medicine.

The multidisciplinary team context

Exposure to multidisciplinary teams elucidated the significance of these roles and functions to the medical students in ways that had previously been invisible. Students reflected on the diverse and complementary contributions of clinicians from different disciplines, quality and safety staff, and from staff who managed patient records, providing an expanded view of healthcare systems.

One student observed "communication and teamwork skills were strengthened as I grew to further appreciate the importance of collaboration and multiple perspectives" (P7). Supervisors through to librarians were identified as providing support and assistance to progress their project.

Valuing documentation

Projects required file audits and were associated with key aspects of the patient journey. These projects necessitated students extracting data from medical record systems, which emphasised the importance of accurate, timely, succinct documentation in patient records. A lack of accurate documentation frustrated data collection efforts and emphasised to students the significance of this component of medical practice:

> *I learned the reason we do discharge summaries and the real risk posed to patients if we do not complete this document correctly. I learned about what points are important to include in discharge documentation and how to communicate these clearly to a reader who may be time poor and need only essential and not extraneous information.* (P2)

Personal challenges and growth

The scholarly environment differed to clinical placements students had completed previously. While many students relished the opportunity to take ownership and drive the project direction, others found it daunting. Tight timeframes meant putting "aside my perfectionist attitude to appropriately manage time—a skill I see as vital to my role as a doctor" (P19).

Students noted improvements in their ability to communicate and collaborate, effectively manage their time and "balance different commitments" (P1), assess the scale of a project and cultivate resilience—overcoming challenges to see a project through to completion.

Students described some of the challenges, limitations and barriers they faced along with the skills and knowledge gained. This included development of theoretical and conceptual knowledge and specialised knowledge relating to their audit topic. One student shared:

> *This experience allowed me to learn about hospital audits as well as gain a deeper understanding into antimicrobial stewardship. … Daily immersion in antimicrobials and therapeutic guidelines has allowed me to continuously immerse myself in appropriate prescribing behaviours.* (P13)

The role of literature reviews in evidence-based medicine

Students gained a wide variety of scholarly knowledge and capacity, including conducting literature reviews, project planning, designing data collection tools, managing data, collaborating with teams and presenting their findings. Students gained insight into critical thinking and evidence-based practice, which some felt would provide them with an evaluative lens.

Students noted how the SC had supported them to develop a clearer understanding of how literature reviews contribute to evidence-based medicine. The technical skills to carry out a review were another learning outcome frequently mentioned. One student recognised "conducting and critiquing research will likely benefit me as I begin my career in an evidence-based field" (P8).

Student satisfaction

Students expressed high levels of satisfaction with their SC experience. Many students derived gratification from the completion of a project within the time frame and being able to follow the entire quality improvement process through. Seeing the meaning and value of the work and contributing to "producing results that may be a catalyst for change" (P2) was another satisfying element.

Other sources of satisfaction included finding solutions to problems that presented and developing productive, collaborative relationships with supervisors. The vast majority of students reported supervisory experiences in which they felt welcomed, supported and engaged:

> *I was extremely fortunate to have two amazing (SC) supervisors who facilitated inspiring discussions about the topic and provided support where needed, whilst still allowing a lot of flexibility.* (P3)

Students were motivated by the eagerness of members of their project team. This helped them to see the broader value of their work and the contribution it was making to the healthcare setting.

Discussion

The structures of Monash University's scholarly intensive placements have been purposefully designed to facilitate reflective practice. Regular discussions with supervisors provided opportunities for naming distinct elements of the "messy" auditing process and framing experiences and observations of everyday clinical practice through a scholarly lens. Student reflections touched on various aspects of Schön's (2017) reflective practice framework. At times, students expressed surprise when reflecting on action, for example, when confronted with unfavourable audit results and needing to carefully navigate how to communicate these results to those whose practice they related to. Situations such as this highlighted for students the discrepancies between theory in use (Greenwood, 1993) and the stated focus of medical care, as articulated in healthcare policies and standards. Value conflicts (Schön, 2017) became visible in recognising how the time constraints of a demanding healthcare context can subvert efforts to complete important tasks, such as writing effective discharge summaries. Kinsella (2010) also related to Schön's description of the messy and increasingly complex healthcare context in which practice takes place, emphasising the need for integration of reflection, which SCs can provide for emerging health professionals through undertaking QI/A projects.

Opportunities for practice and repetition were incorporated throughout the project, with regular supervisor feedback and support promoting reflection and learning. Projects concluded with oral and written assessments that consolidated knowledge and provided additional occasions for reflection, critical questioning, constructive feedback and review.

The value of QI/A SCs

Regardless of whether medical graduates find employment in research, policy or practitioner roles, undergraduate SC experiences can be drawn upon to inform subsequent approaches to the scholarly components of future roles in medicine. In these findings, the knowledge and skills students report acquiring are highly relevant and transferable to diverse healthcare settings.

Gould and colleagues (2002) have highlighted the potential improvements to patient care outcomes that engaging medical students in QA/I activities could generate, and our results substantiate this. Future research could investigate patient outcomes through file audits, gathering patient perspectives and/or examining evidence of changes to policy and/or practice.

These findings demonstrate that educational and healthcare system outcomes are not mutually exclusive. Jones and colleagues (2015) identified "the inter-related complexities of the educational and care-delivery systems" (p. 110). This provides a rationale for medical schools to increase opportunities for students to undertake QA/I projects to build capacity in the areas highlighted in these findings and increase the number of placements available for SCs, giving students exposure to a wider variety of settings.

Future research could focus on the outcomes of QI/A SCs for the healthcare settings that host them. Measuring the longitudinal impact on policy, practice and patient outcomes is warranted, as well as exploring SC supervisors' experiences of employing a reflective practice framework.

Research considerations

This study was confined to a single university setting, and the results were generated from a relatively small sample of student data. Furthermore, this research relies on student perspectives alone. We would recommend future research apply quantitative and qualitative methods to explore the outcomes of QI/A SCs from the perspectives of healthcare staff from a range of roles and disciplines and, importantly, gather patient and family/carer experiences and outcomes. The strengths of this study lie in its novel use of student reflections and the inclusion of data from students undertaking rural healthcare placements, an under-researched setting but one that deserves increased focus given the well-documented health disparities between rural and metropolitan communities (Ward & Harvey, 2023).

Conclusion

QA/I activities are a valuable but often overlooked learning mechanism by which medical students may gain scholarly knowledge and skills while simultaneously being introduced to the broader healthcare environment of safety and quality. Increasing opportunities for students to undertake QA/I projects can support important translation of knowledge from theory to practice, from the classroom into the workplace, providing supportive guidance to promote the confidence and competence of medical students in implementing evidence-based practice.

Conflicts of interest and funding

The authors all declare that they have no conflicts of interest. No funding was received for this study.

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