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Experience-based learning: how a crisis solution informed fundamental change in a clinical education curriculum

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Abstract

Background: Clinical education represents the most important formative period in undergraduate medical education. It is often criticised as haphazard and inefficient. Experience-based learning (ExBL) is a novel clinical education design that utilises practices of support, learner participation and real patient learning to enhance students' development of vital professional capabilities. We introduced ExBL to address the challenges of a 50% reduction in clinical placement time that arose during the COVID-19 pandemic.

Approach: Final year medical students were assimilated into clinical teams as co-workers to facilitate learning through participation rather than observation. Placement education was supported by an integrated case-based learning and high-fidelity simulation program. Real patient learning in workplace contexts was supported by a network of clinician mentors.

Evaluation: A qualitative evaluation revealed that granting students co-worker status strongly supported participatory learning and professional identity formation. Furthermore, the triangulation of placements with cognitive coaching and high-fidelity simulation greatly enhanced skills development and students' sense of readiness for practice.

Implications: Utilisation of ExBL significantly enhanced the quality of informal learning on clinical placements despite the reduced clinical placement time. In addition, the integration of cognitive coaching with simulation opportunities meant students were better prepared for meaningful participation as members of clinical teams. The introduction of ExBL increased the workload of clinical teachers. Moreover, favouring learning through participatory experience reduced exposure to more traditional formal bedside teaching encounters. Despite these challenges, we have adopted an ExBL model created in a crisis as our core educational design for our final year clinical programme.

1 | BACKGROUND

Clinical education represents a vital formative period for undergraduate medical learners. Despite its importance, it is often portrayed as unplanned and inefficient. The necessities of service delivery and patient care mean that education is often a secondary consideration. Experience-based learning (ExBL) is a mid-range theory that describes a novel approach to practice-based clinical education.[1] Founded on social learning perspectives including communities of practice theory, ExBL provides an evidence-based alternative to traditional observation-based apprenticeship learning where students learn most and best through supported participation in clinical activities.[2] Participation may take one of three forms: *observing* others practice, *rehearsing* one's own practice (e.g. eliciting patient history) or *contributing* to patient care. These are all components of what ExBL terms 'real patient learning' that facilitate the development of key proficiencies that underpin their identity formation as doctors.[1,2]

Student participation and real patient learning are contingent on the quality of support afforded in clinical placements. ExBL describes three essential forms of support: pedagogic (e.g. enabling students to learn through reflection on experience), affective (e.g. supporting students' sense of belonging within clinical teams) and organisational (e.g. curricular designs that support learning from experience).[2]

The COVID-19 pandemic generated unprecedented challenges for the delivery of effective clinical education worldwide.[3,4] In Ireland, social distancing requirements meant clinical placement time for undergraduate medical students required 50% reduction. These major and abrupt changes proposed a major challenge for curriculum planners to provide sufficient and effective clinical training. Here, we describe the approach taken by one medical school to address the clinical placement deficit by changing the status of students from observers to co-workers using the ExBL approach.[5] We used the essential ExBL characteristics of participation, real patient learning and support to structure our new immersive clinical education programme for final year medical students.

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The context for this innovation is a mid-size direct entry medical school (200 + annual intake). It offers a 5-year systems-based undergraduate programme in which the latter 2 ½ years are dedicated to clinical education. Prior to the COVID-19 pandemic, the medical school employed a traditional clinical attachment model in which students were placed as observers in a non-participatory role, in clinical teams across clinical specialties interspersed with block learning (Table 1). The onset of the pandemic led to a nationally mandated 50% reduction in clinical placement time for final year medical students. Given the marked reduction in clinical immersion, we elected to use an ExBL approach to increase the efficiency and effectiveness of students' clinical education experience.

2 | APPROACH

We initiated several changes to the final year undergraduate medical curriculum:

1. Clinicians were approached early in the organisational process. They had direct input into mapping the learning objectives for their specialty and the teaching approach. Shift-based rotas were introduced in the emergency department and acute assessment units. To accommodate a 'one student per team' approach, subspecialties that traditionally were not directly involved in teaching were included (e.g. oncology, haematology and urology). Students were not expected to have in-depth subspecialty teaching, but rather to learn about the patient journey in a hospital. The net effect was that clinicians were more invested in practical ward-based teaching, with the knowledge that specific learning objectives were being covered in the classroom.

2. Brief training opportunities and materials were provided to clinicians in how to teach 'on the hoof' as well as facilitate reflective debriefings of clinical encounters. Educational approaches such as the '1-min preceptor' were shared. This was to offset any perceived potential disruption to clinical workflow that enhanced teaching could pose.[6] Such teaching methods were utilised because they facilitate reflection in action and on action whilst delivering clinical service.[7,8]

3. We designated students on placement as embedded contributors to the work of clinical teams rather than observers. As co-workers, students carried out patient admissions and diagnostic procedures and participated in informal case discussions. In addition, medical students carried out administrative duties such as pursuing the results of investigations, thereby assisting the other junior team members.

4. Individual students were rapidly assimilated into the daily activities of clinical teams and were provided with considerable support in making sense of their clinical experiences. Supported participatory encounters are critical for students in developing strong professional identities as well as developing vital capabilities necessary for taking on the role of doctor.[3,9]

TABLE 1 Outline of student activity, including structured teaching and clinical placements in 2019 (pre-COVID-19) and 2020 (during COVID-19)

2019		2020	
Placement blocks	Each student • 4-week surgery • 4-week medicine • 4-week integrated care • 9-week junior internship Observership based 3–4 students attached per team	Clinical placement	Each student • 2-week surgery • 2-week medicine • 2-week integrated care • 6-week junior internship Clinical immersion within team 1 student attached per team
Didactic weeks	Live lectures interspersed between each block	Didactic weeks	Asynchronous and synchronous lectures delivered via web-based platform between each block
Bedside teaching and small group core topics	Delivered by clinical lecturers, interspersed within clinical placement time	Structured teaching	Each student • Surgery teaching • Medicine teaching • Integrated care teaching Composed of: • Case-based learning • Simulation • Clinical skills
Assessment	SAQ SBA OSCE Long cases	Assessment	SAQ SBA OSCE using some standardised patients Long cases (standardised patients)

Abbreviations: OSCE, Objective Structured Clinical Examination; SAQ, Short answer Questions; SBA, Single Best Answer Questions.

5. Classroom-based high-fidelity simulation, clinical skills training and case-based learning (CBL) were aligned with clinical placements. All students had equal exposure to clinical placements and structured teaching (Table 1). Teaching blocks were created that prepared students in advance of placement and facilitated their development of clinical reasoning and practical skills. Clinical lecturers were supported in the development of CBL content and creation of simulation scenarios and provided with learning technology support to deliver materials online.

6. CBL scenarios were delivered via videoconferencing using a 'flipped classroom' approach.[10] Clinical skills that would be of immediate use for students in the clinical environment were selected. High-fidelity simulation scenarios that were previously designed to prepare students for clinical practice[11] were adapted to incorporate important non-technical skills, transitions of care scenarios and prescribing into the simulation scenarios. This included interaction with families, escalation of care, discharge planning and patient safety elements around new medications to reflect real-world clinical practice.

7. Each student was assigned a mentor, who played a pivotal role in supporting students. They met regularly to discuss practical issues regarding placement, memorable experiences and critical incidents. Mentors were made aware of university channels for supporting students in distress. A key element of mentorship was to reflect on all encounters (Figure 1). The traditional medical logbook was altered to reflect regulatory limitations on clinical placement time as well as the new ExBL design. It facilitated students' recording,
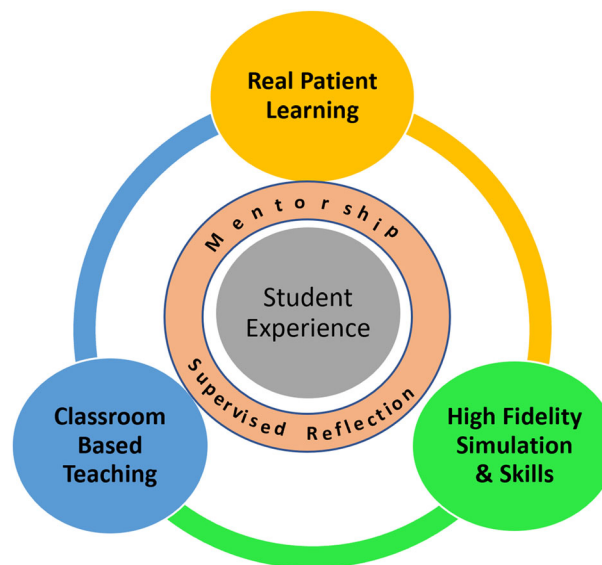
FIGURE 1 Summary diagram explaining the integration of real patient learning, high-fidelity simulation and classroom-based teaching and the pivotal role of mentorship and supervised reflection on the student experience

making sense and writing reflections in relation to important patient encounters and became a focal point during meetings.

8. The medical school provided students with distinctly coloured and labelled surgical scrubs for use in clinical settings (Figure 2). Surprisingly, we found that this simple innovation strongly enhanced

undergraduate students' sense of fitting in with clinical teams and acted as a visual reminder for clinical staff to facilitate learning at every opportunity.

9. COVID-19 transmission risk was addressed by developing a mobile phone application to facilitate daily student 'check-ins'. If asymptomatic, students received a 'green pass'. It was regularly checked prior to attendance at clinical placement.

3 | EVALUATION

ExBL was integrated at our medical school as a rapidly achievable way to enhance the learning process for our students during a crisis. Our evaluation strategy was not considered during the design. Accordingly, we undertook a retrospective look at learner perceptions (i.e. Kirkpatrick's framework Level 2)[12] of the initiative. Realising the potential for ongoing integration of ExBL, we sought feedback from our students to detail what worked well and what could be improved upon. Although this evaluation took place several weeks after the ExBL intervention had ended, student feedback has been useful in highlighting benefits and identifying learning gaps.

Given that they had undergone traditional observational clinical placements in earlier years, students were in a good position to comment on differences in the final year placement. Two strong and consistent findings emerged (Table 2):

1. Being situated as an embedded clinical team member with uninterrupted clinical immersion. Previously, the integration of classroom and clinical education interfered with clinical placement. Students often had to leave the clinical setting to attend formal teaching events. However, the uninterrupted clinical experience was viewed as a positive development. In addition, wearing distinct clinical scrubs supported participatory learning and professional identity formation.

2. The alignment of intense clinical placements with CBL and high-fidelity simulation enhanced both learning experiences where one learning environment complemented the other.

Assessment remained largely unchanged, apart from introduction of standardised patients for some components (Table 1). Ultimately, it was not the key driver for our curriculum revision.

4 | IMPLICATIONS

Our priority in redesigning clinical placement was to ensure students were supported in clinical workplaces to become self-actualising participants[13] despite the COVID-19 limitations. From our evaluation, it appeared that solo placements ensured that students were invited to be active participators and contribute to patient care rather than play the role of passive observers. Symbolic elements such as wearing team scrubs mattered hugely in terms of supporting identity formation and a sense of belonging. A key decision arising from our experience is that we will not return to our traditional observational based and non-participatory clinical education model.

Our priority in redesigning clinical placement was to ensure students were supported in clinical workplaces to become self-actualising participants[13] despite the COVID-19 limitations.

TABLE 2 Themes from qualitative data on the restructured medical curriculum

Theme or Outcome	Quotations
Enhanced participatory learning and professional identity formation	'I was made to feel part of the team from the first morning'
	'Student immersion as part of the team might be the best change to clinical placement …. I did not feel as if I was merely shadowing the team as part of a small group of assigned students. Rather, I felt that I was a part of the team …. Absolutely fantastic change'
	'Wearing blue scrubs makes us identifiable, so interns and other NCHDs from entirely different departments came up to me and spontaneously gave me mini tutorials on the wards!'
	'I liked how clinical activities are separate from formal teaching. This meant that I did not have to jet off to some tutorial/ lecture halfway through clinic or seeing a patient'
Complementary alignment of intense clinical placements with case-based learning and high-fidelity simulation	'Simulation days were very good for getting us into the role of a future intern … I really felt the need to transition from the passive medical student mindset to a more proactive intern way of thinking in these sessions'
	'The simulation sessions are an excellent learning experience as when studying you take that you understand or know things for granted … now I approach my study a little differently, ensuring I fully understand the steps of my management and how the whole thing would unfold in a clinical environment'
	'The separation of clinical placement and structured teaching, as you can really focus more on each one while you are doing them—worked very well for me'

Mentorship and supervised reflection based on logged experiences allowed students to appropriately anchor learning and reflect on experiences of participation. This enabled students to understand the scope and complexity of illness and disease and to link theory with practice.[3] Student agency was fully supported by clinical colleagues. In planning clinical placements, students were given implicit licence to join the team work practices. Our intent was not to plan for a cultural change towards medical students, but by changing the environment (e.g. scrubs and implicit team contact), there was a cultural shift towards placement from both a student and a clinician perspective.

The deliberate integration of real patient learning, classroom-based education and high-fidelity simulation accelerated learning and ensured students were better prepared for subsequent placements. By integrating transitions of care into scenarios, we merged principles relating to ExBL with the hi-fidelity simulation environment. Instead of being viewed in conflict and competing for space in the curriculum,[14] we demonstrated a synergistic effect, which will require further exploration.

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There were also some drawbacks in our approach that we have attempted to address in our curriculum planning. Although our students had a greatly improved informal learning experience through immersion in the day-to-day working of clinical teams, this came at the cost of a reduction in opportunities for formal bedside observation of students' performance of clinical skills and acumen. To address this deficit, we have introduced formative work-based learning assessments such as the mini-CEX in which students get formal one-to-one observation and feedback on aspects of practice. Providing an EXBL programme with a synergistic CBL and simulation experience significantly increased the workload of our clinical teachers. With the reduction in the requirements for social distancing, we have been able to mitigate this somewhat by working with larger class sizes and are exploring methods for broadening our educator base through innovations such as peer-assisted learning.

In summary, our rapidly adapted program appeared to be effective in maintaining, and possibly improving, the student learning experience. As we undertake further evaluation and research into the impact of the changes necessitated by the pandemic, it appears that medical education is currently undergoing transformative changes. Whilst disruptive to organise, there have been numerous positive outcomes of integrating an ExBL model into our programme, and we hope to continue to embrace change and work towards the best educational experience for students, patients and educators.

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