

An innovative, remote supported problem-based learning model in a South African medical curriculum during the COVID-19 pandemic

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Why was the idea necessary?

The undergraduate medical curriculum at the Faculty of Health Sciences at the University of Cape Town (UCT) has adopted an interdisciplinary, active learning approach, termed supported problem-based learning (SPBL). The SPBL model retains the hallmarks of a PBL curriculum,^[1] which is a self-directed,^[2] collaborative, experiential and constructivist approach to learning.^[3,4] However, learning is supported by lectures, tutorials and practical sessions.

SPBL engages active learning through facilitator-led, face-to-face small-group work that addresses contextually relevant paper-based cases, and aims to develop the higher-order cognition and clinical reasoning of pre-clinical students (years 1 - 3). Students engage with each case through an eight-step process that entails interrogating their prior knowledge (i.e. constructivism), linking important concepts, identifying gaps in their knowledge about the case (i.e. self-directed learning) and addressing these knowledge gaps through engaging with the work independently and within their SPBL groups.

COVID-19-related risks required an urgent transition from face-to-face teaching to emergency remote teaching (ERT),^[5] which is an entirely online curriculum. This created significant challenges, as many students and staff struggled to work from home owing to increased family responsibilities, unstable internet connectivity and a lack of access to computer devices and data. These challenges prompted UCT to issue the following guidelines for course revisions in ERT, which incorporated a socially just and equitable approach:

- reduced curricula time from 40 to 30 hours per week
- a completely online curriculum using low technology and low data costs
- asynchronous learning, i.e. information-sharing and peer engagement, which occurred without real-time sessions.

Furthermore, many students experienced increased anxiety, social isolation and depression owing to the COVID-19 crisis. Therefore an element of social cohesion had to be included in ERT. A critical rationale for maintaining SPBL in ERT was to render emotional containment through paced online sessions with small-group learning. Thus a SPBL curriculum was developed to address the pedagogical challenges of ERT in a South African setting, namely remote SPBL.

What was tried?

UCT's online collaboration and learning environment, VULA, was the primary technology used to drive remote SPBL, especially since it was

the data was zero-rated by mobile networks as a result of the COVID-19 pandemic.^[6] Each SPBL group had a dedicated 'folder/section' on the Forums tool in VULA (see evidence of innovation section), where they could actively engage with one another via asynchronous online discussions by uploading responses to learning objectives, and posting questions. However, some groups acknowledged the need for greater collaboration, and opted for synchronous discussions (i.e. real-time engagement) using various online communication tools, mainly WhatsApp. Narrated lectures, online tutorials and continuous formative assessments were uploaded onto VULA to support student learning. Student engagement with SPBL cases assisted with the assimilation of complex concepts and knowledge transfer during ERT. Laptops and data were provided to students who required them.

Reduced curriculum time during ERT, and the limitations of the online tools, led to certain amendments to SPBL, such as the exclusion of self-directed learning (SDL) and the interrogation of prior knowledge. The loss of these principles was offset by the flexibility afforded within years 1 - 3, which is one extended learning cohort, thereby offering opportunities for catching up in the later years of the MB ChB programme.

A key priority was to ensure that students completed the core learning material. Consequently, SDL was excluded, as students were provided with weekly guidelines and lesson plans to assist with time management. Collaborative, experiential and contextual learning was maintained, as small-group learning continued to centre around locally relevant paper-based cases.

Another priority during ERT was non-academic student support, and the early identification of students who were struggling academically. Facilitator-led group work was maintained to ensure that a network of staff members was in contact with all students. Thus the early detection of each student's barriers to learning was facilitated and relevant support rendered timeously. SPBL facilitators received training to guide their groups online and monitor student participation. An effective student referral system was developed between facilitators, students, class representatives and course convenors through consistent communications on WhatsApp groups and regular (fortnightly) meetings (Fig. 1). Following feedback from students, facilitators and class representatives, convenors referred students to appropriate support structures. This would have been impossible if the small-group learning model was abandoned during ERT.

The lessons learnt

What worked

Remote SPBL achieved the aim of providing students with academic and social support while working remotely. Students found solidarity, appreciated their peers' diverse experiences and supported one another during the pandemic. Remote SPBL offered an effective learning repository for students to share resources, resulting in enriched interactions with the content. Moreover, students appreciated the peer-held accountability for SPBL sessions, and seeing their peers' integration of different resources. It also ensured student inclusion, contributed to their progression and facilitated the successful completion of their courses.

Remote SPBL offered new scope for preparing students for ethical digital communications and online learning, and developed their confidence in using technology. It strengthened the students' capacity to effectively problem-solve using the technologies of the fourth industrial revolution, enhancing their capacity for online interaction, networking and collaboration.

Despite the challenges of implementing remote SPBL, the core elements of the curriculum and the integration of disciplinary knowledge were maintained. Responsiveness to student and facilitator feedback was central to the success of remote SPBL, which evolved to be more user-friendly over time. Lastly, the asynchronous format required fewer facilitators, negating the need to train new facilitators, and thereby saving on costs.

What did not work

During remote SPBL, some challenges were identified, including the limitations of an asynchronous digital learning platform for effective group interaction and collaborative learning. This resulted in diminished interactions and visual prompts, which impacted students' conceptual integration and discussion. This, along with limited preparation time, resulted in students' applying Bloom's lower-order thinking skills of rote learning, rather than higher-order thinking skills^[7] that utilise critical thinking and problem-solving.^[8] Furthermore, time management was a reported problem, as students struggled with the pace of the online curriculum, which impacted their SDL.

Non-academic commitments presented obstacles to accessing online learning adequately, and varied across gender, class, race and location, for example, caring for elderly relatives, young children and livestock, and trying to work in disruptive environments.

What we will keep in our practice

Upon students' return to campus, it was anticipated that their access to the internet would improve. Where the low-technology approach necessitated asynchronous learning, which negatively impacted collaborative learning, future online SPBL models will adopt a blended learning approach utilising appropriate tools and technology. This will enable an amalgamation of synchronous discussions using online communication tools, and asynchronous engagement with the learning materials. Tools such as a virtual whiteboard (e.g. Padlet) should be considered to enhance small-group communication and teamwork. Therefore the implementation of the blended SPBL approach is imperative to effectively scaffold students' learning and facilitate their higher-order thinking skills.

Before embarking on remote SPBL, surveys of student access to the internet, data and devices, and home circumstances, were conducted to inform the need for financial and other forms of support to ensure that no student was excluded or disadvantaged by online learning. Such surveys should be updated on an annual basis for efficacious feedback to account for new students and evolving needs.

Remote SPBL promoted group cohesion and social solidarity and provided emotional containment among students at a time of crisis. Continuity in group membership and facilitation led to sustained relationships that rendered greater peer support and stability in the learning environment. Therefore, SPBL groups should remain the same for more than one semester.

With the move to blended teaching where distanced teaching is still required, the blended SPBL approach will be valuable in tracking student participation, identifying students with

anxieties and challenges, providing appropriate academic, social and emotional support and fostering a sense of social solidarity, thereby strengthening collaborative learning. Hence we will continue with this approach as we navigate the changing requirements for social distancing.

The remote SPBL innovation could be adopted in low-resourced educational and healthcare settings, owing to its easy and cost-effective approach that draws on simple web-based learning platforms. Virtual collaborative learning through asynchronous peer discussion utilising problem-based cases could be included in the training programmes of other healthcare professionals, and in preparing community members for task-shifting (e.g. community health workers or traditional birth attendants).

What we will not do

Core aspects of SPBL are constructivism and SDL. Therefore, these steps will not be excluded in future, to ensure scaffolding of knowledge and personalised learning. SPBL will also not be delivered solely asynchronously at UCT as long as adequate resources are available. However, in the event of inadequate resources, the benefit of hindsight has revealed that asynchronous group discussions could be strengthened by structured and active online facilitation, and incorporating interactive tools such as blogs and Padlet. We caution against dividing learning objectives among students and assessing their SPBL participation, as this will further undermine collaborative learning.

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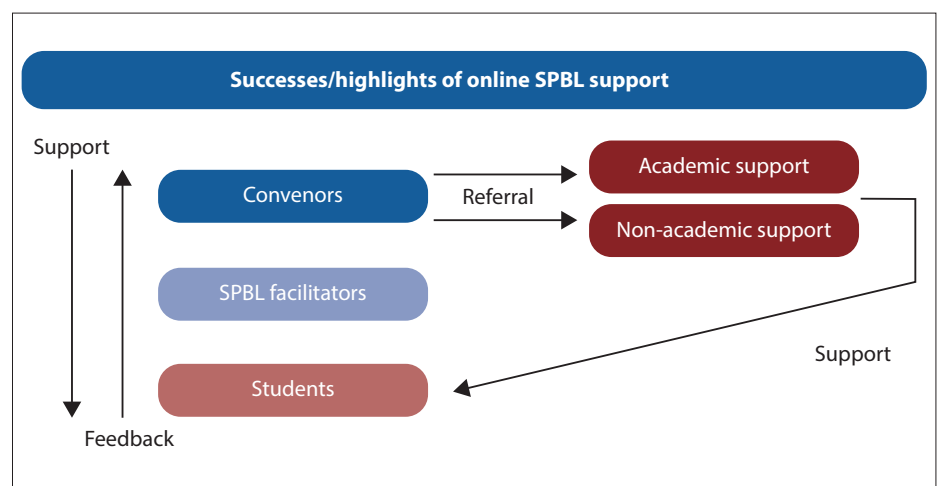


Fig. 1. Student referral system in the remote supported problem-based learning (SPBL) model.

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Evidence of innovation



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