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Brydon Panozzo

The University of Newcastle, Australia, and Central Coast Local Health District

Georgina Dixon

The University of Newcastle, Australia, and Central Coast Local Health District

Phillip St Flour

The University of Newcastle, Australia, and Central Coast Local Health District

Mary-Ann Ryall

The University of Newcastle, Australia, and Central Coast Local Health District

Amanda Dawson

The University of Newcastle, Australia, and Central Coast Local Health District

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Evaluating medical student and teacher attitudes of virtually delivered near-peer medical teaching during the COVID-19 pandemic

Brydon Panozzo,* Georgina Dixon,* Phillip St Flour,* Mary-Ann Ryall,* Amanda Dawson*

* The University of Newcastle Central Coast Clinical School, Newcastle, Australia and Central Coast Local Health District, NSW, Australia

Abstract

Objective: To evaluate the effectiveness of video conferences for the delivery of near-peer medical teaching adopted in response to the COVID-19 pandemic from the perspective of medical students and near-peer teachers.

Methods: A mixed-methods online survey of medical students (years 3 – 5 of a five-year medical program) and near-peer teachers (junior medical officers post-graduate years 1-3) participating in a video conference based near-peer medical teaching (NPMT) program was undertaken throughout the 2020 clinical year. A further comparative survey was conducted with those students and near-peer teachers who had previously participated in face-to-face near-peer teaching sessions. The results of these surveys were analysed using descriptive statistics and inductive thematic analysis.

Results: Students and near-peer teachers found the video conference software to be user friendly (93.3%, n = 14 and 77.8%, n=7) and expressed interest in ongoing video conference delivered material (93.4%, n= 14 and 88.9% n = 8). Students were divided as to whether the video conference method of delivery limited (40%, n= 7) or did not limit (26.7%, n = 4) their interactions, while teachers noted that video conferencing did not enhance engagement (66.7%, n= 6). These findings were supported by the qualitative analysis. Key themes identified included positive reception of the teachers, content, and improved attendance/ease associated with video conferencing. Difficulties with the foreign nature of the teaching style and student engagement were also reflected in the qualitative data.

Conclusion: The COVID-19 pandemic has impacted the manner in which medical student education is approached. The experience presented here from medical students and near-peer teachers demonstrates a general acceptance of video conferencing as a method of content delivery in the near-peer setting, necessitated by restrictions on face-to-face interactions secondary to the COVID-19 pandemic. Divisions remain as to whether the technology, as it is currently implemented, can maintain or surpass the interaction and engagement which accompanies face-to-face near-peer medical education.

I INTRODUCTION

The COVID-19 pandemic has introduced many new challenges. Medical educators have been required to adapt and innovate with urgency to support learners whilst ensuring the safety and minimising potential exposures of patients, staff, and students (Rose, 2020). The University of Newcastle's Central Coast Clinical School on the New South Wales Central Coast provides education to medical students from the University of Newcastle as part of the five-year undergraduate Joint Medical Program with the University of New England. Much of the formal university teaching transitioned to online platforms during 2020 to minimise potential exposure to Covid19 and to minimise groups of people moving through the hospital, as per health and safety restrictions guided by the clinical school. Video conferencing, as a platform for the delivery of medical education, has been previously used successfully to address geographic challenges of providing education in rural and remote areas (Smith et al., 2012).

Near peer medical teaching is becoming an established component of medical education programs around the world (Benè & Bergus, 2014). No firm definition of a 'near-peer teacher' exists, and the near-peer teachers do not necessarily possess formal training in education. They do, however, share a similar background or circumstances to the students, and are generally within a two to five-year training margin (Border et al., 2017). The Central Coast Near Peer Medical Teaching (NPMT) program is the current iteration of a local education initiative first established in 2016 (Near-Peer Medical Teaching Program, 2020). The NPMT provides educational sessions for medical students at the Central Coast Clinical School, as an adjunct to the medical students' formal university teaching activities and self-directed study. The NPMT program is run by the Junior Medical Officers (JMOs); generally, post-graduate years 1-3, working in the Central Coast Local Health District. It includes voluntary weekly tutorials, small group bedside teaching and skills sessions for University of Newcastle medical students in years 3-5 who are currently undertaking a rotation at the Central Coast Clinical School. All of the content is written and facilitated by JMOs and reviewed by senior medical officers (prior to the teaching session/publication) on a voluntary basis.

Prior to 2020, face-to-face sessions were the primary educational format of the NPMT program. The transition of the NPMT program to exclusively video conference sessions and online resources, as necessitated by the pandemic, suspended face-to-face interactions between the medical students and near-peer teachers. The NPMT sessions, which were previously delivered during business hours, were rescheduled to the late evening for the duration of the period of online-only delivery. No changes were made to the length of individual sessions or the number of hours of content delivered per week. All of the course content is freely available online on the NPMT website, in keeping with the Free Open-Access Medical education (FOAM) ideology (Near-Peer Medical Teaching Program, 2020; Nickson & Cadogan, 2014).

The NPMT program committee felt that the face-to-face interactions underpinned much of the value of the NPMT program, through the creation of an environment where students felt comfortable to ask questions that they may otherwise not feel able to ask more senior lecturers/educators. Undoubtedly, this social proximity facilitates a degree of unintentional learning outside of the program content, the "Hidden Curriculum". This concept identifies the difference between what is taught, and what is incidentally learned (implicit social and cultural messages), and has been the subject of criticism for contributing to a decline in medical professionalism (Rajput et al., 2017). It should be highlighted, however, that the Hidden Curriculum may also exert a positive effect on student development within the health care environment. This has been previously demonstrated by McKenna and Williams (2017), who examined the attitudes of nursing and paramedicine students and their near-peer teachers following the completion of a near-peer led or supported clinical skills session. The authors concluded that the Hidden Curriculum can be a powerful vessel for positive learning when the

less desirable aspects are identified and managed (McKenna & Williams, 2017). Through these near-peer relationships, it is more likely that the Hidden Curriculum can be identified by the near-peer teachers in less formal teaching sessions, thereby increasing the students' awareness of the potential pitfalls that harbours, and thus decreasing its negative impact.

This study was undertaken to characterise the medical student and near-peer teacher perspectives on the pandemic-driven transition to online-only education, and to ascertain the effect of removing face-to-face interactions on their respective experiences with the NPMT program.

II METHODS

The research was completed as a mixed methods study. Medical students and near-peer teachers who participated in the 2020 virtual NPMT program were invited to complete an online anonymous survey. This invitation was extended as a broadcast email from the Medical Education Workforce Unit to all JMOs and all local medical students with a second, 'reminder', email broadcast two weeks later. The survey asked recipients to confirm that they had participated in the NPMT program prior to proceeding. The survey participants were asked to respond to a list of statements on a Likert scale from 1 (strongly disagree) to 5 (strongly agree) relating to their general experience of the virtual sessions. The near-peer teachers were also asked specifically about the video conferencing features available on the platform, again responding to statements on a Likert scale from 1 (I did not use this feature) to 4 (helpful). Respondents who had participated in both a virtual session in 2020 and face-to-face session in 2019 were invited to complete an additional survey providing responses to a list of statements comparing their face-to-face to virtual experience from 1 (strongly disagree) to 5 (strongly agree). The survey questions are summarised in the Results section below. The data were analysed using basic descriptive statistical methods. Respondents were also given the opportunity to make unstructured additional comments in free text. Inductive thematic analysis of the free-text responses was conducted (Braun & Clarke, 2006). Qualitative data was used to contextualise quantitative findings, providing explanations and clinical insight.

Survey data was collected anonymously and managed using REDCap electronic data capture tools hosted at the Central Coast Local Health District (Harris et al., 2019). The 2020 virtual NPMT sessions were delivered via the Zoom video conferencing platform, due to its wide availability, to reduce barriers to participation for both students and near-peer teachers (<https://zoom.us/>). Zoom also contains a range of features that may be employed to enhance teaching.

This project was authorised by the University of Newcastle Ethics Committee (approval number: QA230) and the Central Coast Local Health District Operation Research Committee (approval number: 0420-041C).

III RESULTS

A Quantitative

Between January 2020 and August 2020, 16 teachers offered a total of 38 virtual NPMT sessions, conducted with between 1 to 12 participants in each attended session. A total of 24 survey responses were received, 15 students and 9 teachers (Tables 1 & 2). Of the 24 responses received, 8 completed the additional comparison survey, 6 students and 2 teachers (Table 3). Responses were received from students in their 3rd, 4th, and 5th years of medical education, with the majority having participated in at least 4 virtual sessions (53%, n = 8) and all respondents having participated in at least 2 sessions.

Table 1
Student Responses in the Video Conference NPMT survey

Statements	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
The video conferencing software was user friendly	0.0	0.0	6.7	40.0	53.3
The video conferencing platform limited your learning	13.3	53.3	26.7	6.7	0.0
The video conferencing platform enhanced your engagement	0.0	26.7	60.0	13.3	0.0
The video conferencing platform limited interactions	6.7	20.0	33.3	40.0	0.0
The video conferencing platform was a barrier to your attendance	66.7	26.7	0.0	6.7	0.0
The content was relevant to my studies/exams	0.0	0.0	0.0	66.7	33.3
The content covered will be useful as a junior doctor	0.0	0.0	0.0	40.0	60.0
I receive other teaching on this topic elsewhere in my course	0.0	33.3	13.3	46.7	6.7
The content was presented in a unique way to other teaching I receive in my course	0.0	6.7	6.7	66.7	20.0
The session was interactive	0.0	0.0	13.3	53.3	33.3
My understanding/confidence in the topics was improved by the session	0.0	0.0	6.7	53.3	40.0
I would like to attend video conference Near Peer Medical Teaching (NPMT) tutorial sessions in the future	0.0	0.0	6.7	46.7	46.7

Student responses to the video conference NPMT survey n = 15

Table 2
Teacher Responses in the Video Conference NPMT survey

Statements	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
The video conferencing software was user friendly	0.0	0.0	22.2	66.7	11.1
The video conferencing platform limited your teaching	0.0	0.0	0.0	100.0	0.0
Student engagement appeared enhanced on the video conferencing platform	11.1	55.6	22.2	11.1	0.0
The video conferencing platform limited interactions	0.0	22.2	0.0	55.6	22.2
The video conferencing platform was a barrier to student attendance	11.1	11.1	33.3	22.2	22.2
I would like to facilitate video conference Near Peer Medical Teaching (NPMT) tutorial sessions in the future	0.0	0.0	11.1	77.8	11.1
The video conferencing software was user friendly	0.0	0.0	22.2	66.7	11.1

Teacher responses to video conference NPMT survey n = 9

Table 3
Student Responses to the comparator NPMT survey

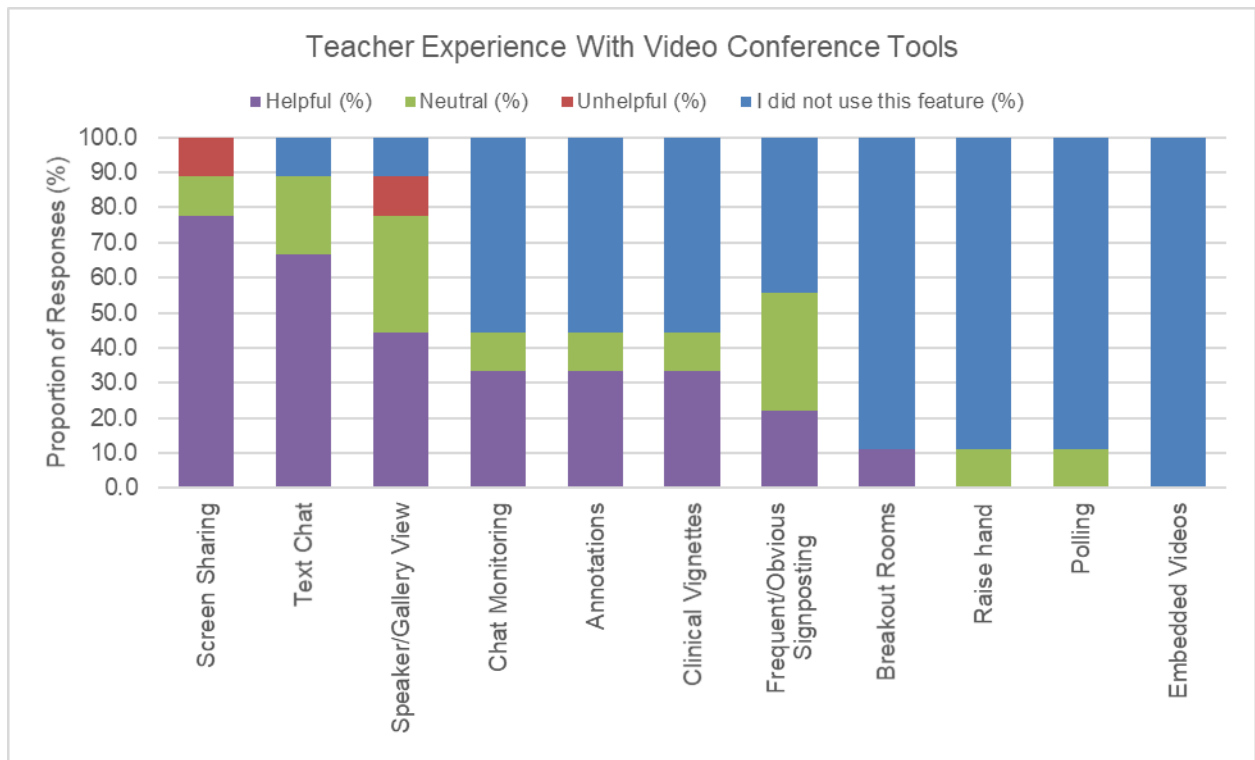
Statements	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Video conference sessions were more engaging	0.0	50.0	50.0	0.0	0.0
Teachers made a bigger effort to engage students in face-to-face sessions	0.0	16.7	16.7	33.3	33.3
Students were more distracted in video conference sessions	0.0	33.3	16.7	50.0	0.0
Questions were more readily able to be addressed in face-to-face sessions	0.0	33.3	33.3	33.3	0.0
Face-to-face sessions were more interactive	0.0	33.3	0.0	50.0	16.7
I would prefer more video conferencing of NPMT sessions	0.0	33.3	16.7	33.3	16.7
I would be more likely to attend/facilitate video conferencing of NPMT sessions	0.0	16.7	0.0	66.7	16.7

Student responses to the comparator NPMT survey n = 6

As a platform, overall students and teachers found the video conference software to be user friendly (93.3%, n = 14 and 77.8%, n = 7). Students were divided as to whether they agreed or disagreed that the platform limited their interactions (40%, n = 7 vs 26.7%, n = 4). Furthermore, the majority of students answered neutrally (60%, n=9) as to whether the medium of delivery enhanced their engagement. All teachers agreed that the video conference software limited their teaching (100%, n = 9) and noted that the platform did not enhance engagement (66.7%, n = 6). Of the 6 students who completed the comparator survey, no one agreed that the video conference sessions were more engaging than face-to-face sessions, with the majority stating that the face-to-face sessions were more interactive (83.3%, n = 5). Most students (93.3%, n = 14) disagreed when asked if they believed that the video conference format was a barrier to their attendance. The three video conferencing features rated as the most helpful were screen sharing, text chat and speaker/gallery view (Figure 1). The majority of teachers indicated that they would be interested in additional training or skills development in preparing for video conference sessions (77.7%, n=7).

All students answered that they believed that the content of the NPMT sessions was both relevant and useful to the work of a junior doctor. The majority of students and teachers expressed interest in engaging in more NPMT video conference sessions in the future (93.4%, n = 14 and 88.9% n = 8). All students indicated overall satisfaction with the virtual program.

Figure 1
Teacher Experience with Video Conference Tools



Teacher responses to the experience with video conference tools n=9

B Qualitative

The qualitative data from the free-text ‘additional comments’ question in the surveys provided support for the quantitative findings and insights into particular differences between student and tutor experiences of using the video conferencing platform during the COVID-19 pandemic.

Students’ comments centred around the near-peer teachers, and the content and format of the sessions. The students consistently commented on teachers being “very interactive and knowledgeable”, “excellent” and “great facilitators”. Teachers were generally described as approachable and non-judgemental, with particular appreciation of the ‘near peer’ nature of the teachers, illustrated by the comment: “... The fact they [NPMT sessions] were provided by junior doctors also meant I felt more able to ask questions that I may not have been comfortable to ask of a consultant”.

The majority of students felt that the video conference sessions were of appropriate length, the content was relevant – “really helpful, especially the VIVA session about how to approach answering questions”. Generally, the students commented that the video conferencing platform allowed for a positive level of interaction between students and with the teacher. One student, however, commented on difficulty amalgamating the NPMT content with their university curriculum, “I really struggled with the formatting of classes in attempting to approach the learning objective framework.... Overall, I learned a lot, I am just concerned if I have learned what I need to pass the exams”.

As demonstrated in the quantitative data, teachers universally commented that video conferencing limited teaching and was a foreign teaching style, illustrated in the comment: “I found it poorly suited for my preferred teaching style, which is more whiteboard action and hands-on with material”, and “I found the lack of direct feedback to be a bit distracting, and many times it felt like I was speaking into the void”. There was also concern that the platform limited the

“teaching practical skills that require physical attendance”. Concerns regarding student engagement were consistent in the teachers’ comments. Teachers noted students appeared uncomfortable with having video/microphones ‘on’ but did engage better with the text ‘chat’ feature, and smaller numbers of attendees.

Both students and teachers noted the improved convenience and access associated with video conferencing sessions. One student noted “video probably improved attendance rate ... online meant I didn't miss out”. This was also true for teachers, who commented on the increased ease of the online platform, illustrated by this teacher’s comment: “It [video conferencing] is a convenient system that allows teaching outside working hours”.

This sentiment was echoed in the comparison survey, as seen in this student’s comment “I was more likely to attend when I could [video conference] in from home”. One teacher noted: “The attendance rates were higher in video conference sessions than face-to-face sessions ... doing sessions from home meant that they were not interrupted by clinical priorities ... The ability to record sessions was also useful for students who could not attend the sessions or wanted to revise content after the session”. Student comments were split on whether there was a difference in quality between face-to-face and video conference session, however, everyone appeared to accept it in the context of the COVID-19 pandemic. For example, one student commented that they “found no difference in the quality of the sessions”, while another noted “I found that the experience of teaching was superior in face-to-face sessions. However, given the COVID pandemic... video conference sessions were a useful adjunct to ensure teaching was able to continue”. One teacher commented that the video conferencing platform was “very useful given the COVID situation”.

IV DISCUSSION

The results of the survey generally demonstrate mixed attitudes towards the shift to video conference NPMT sessions, a change necessitated by the COVID-19 pandemic. It is currently unclear as to what extent the adopted virtual practices should be integrated into regular practice following the resumption of face-to-face clinical educational opportunities. The qualitative analysis certainly demonstrates a positive student perspective towards the utility of the adaptive changes made to the NPMT program under the COVID-19 circumstances. It may be that the positive reception of the online delivery was, however, confounded by the context of its initiation, such that some teaching was better than no teaching. The quantitative analysis clearly demonstrated gaps in the virtual program in key areas including engagement, with teachers feeling limited by the novel virtual arrangement. These concerns about teaching and engagement were consistent in the qualitative data. Zoom was the chosen platform, as it is free and accessible to all, thereby reducing barriers to access. Furthermore, it has many features that may be used to enhance the educational experience. Unfortunately, however, the data demonstrated that near-peer teachers felt inadequately equipped to utilise the software and its various features. Further training for near-peer teachers in additional zoom features including polling, annotations and break out rooms may be useful, especially considering the interest expressed by teachers for further skills development in this area. Training may also assist in improving engagement and interaction, which were areas highlighted by the teachers as a point of concern.

The study is limited by the small number of respondents, particularly in the qualitative data, as not all respondents left text comments. The program’s attendance records captured the cumulative number of student-teacher interactions across all of the NPMT sessions, however, did not identify individual students. As such, we are unable to accurately estimate the response rate from the data available. A further limitation of the study is the impact of recall bias, particularly in the context of the comparative survey, which required respondents to compare recent experiences with those from up to 18-months ago (previously attended pre-COVID-19 face-to-

face NPMT sessions). Context bias may have impacted the positive reception of the transition to video conference delivery of NPMT tutorials, as all face-to-face teaching was placed on hold due to COVID-19.

Further research is required to establish if the mixed perspectives regarding loss of engagement and interaction, and teacher feelings of video conference platform limiting their ability to teach, are associated with an objective difference in the educational outcomes of face-to-face NPMT sessions, when compared to video conferencing NPMT sessions. Further studies should also be conducted outside of the acute context of a global pandemic (which has necessitated social distancing) to confirm that video conferencing is still positively received when delivered alongside face-to-face tutorials.

V CONCLUSION

The COVID-19 pandemic has dramatically impacted the way medical student clinical education is approached. The impact of the health and safety restrictions imposed by the clinical school in an effort to reduce the level of risk to staff, students, and patients in the pandemic environment, is yet to be fully elucidated. The unexpected change demanded rapid and sweeping adjustments to the delivery of clinical teaching. The adaptive responses made to accommodate student educational requirements in this novel environment require cautious and constant evaluation. The experience presented here from medical students and near peer teachers demonstrates a general acceptance of video conferencing as a method of content delivery, particularly in the context of limited face-to-face interactions necessitated by the pandemic. Divisions remain, however, as to whether the technology, as it is currently implemented, can maintain or surpass the interaction and engagement which accompanies face-to-face education. Training of near peer teachers in video conferencing techniques and specifically in features of Zoom may improve the engagement and the experience of teachers and students. Further research, particularly looking at objective outcome measures, would be of benefit to more thoroughly evaluate the shift to online delivery of the NPMT sessions. As face-to-face delivery of the teaching sessions once again becomes possible, a repeat evaluation which includes a direct comparison between face-to-face and virtually delivered sessions would likely be invaluable to our understanding of the impact that the delivery method has on student and teacher attitudes toward the NPMT program.

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