# Experiencing Feedback Channels during Online Research Supervision: A Perspective by Preclinical Students

**Nurfarahin Nasri**[*] , **Nik Mohd Rahimi** , **Harwati Hashim** and
**Nurfaradilla Mohamad Nasri**
Faculty of Education, Universiti Kebangsaan Malaysia, Malaysia

**Abstract.** Due to the unprecedented faculty closures, the COVID-19 pandemic has rendered online learning as one of the most effective tools for maintaining access to higher education. While there is a growing body of literature investigating the pedagogical aspect of online learning, less attention has been paid to address the issue of online research supervision. This qualitative study investigated preclinical students' perceptions and experiences of different feedback channels during online research supervision. A total of 113 (n=66 females, n=47 males) preclinical students volunteered for the focus group discussions. The data were analysed using a hybrid inductive and deductive analysis approach. Findings revealed three overarching themes: (1) diversified personal input, (2) responsive to socio-emotional needs, and (3) prompt for actions. These findings showed that preclinical students received various feedback through different channels during their online research supervision. Most importantly, this study indicated that personalising feedback channel within an online research supervision serves as the key in supporting and sustaining preclinical students' research progress, especially during critical times. The findings of this study can be used as a guide for supervisors who are doing remote online research supervision to focus on personalising feedback channels in response to individual students' learning demands and circumstances.

**Keywords:** online research supervision; feedback channels; feedback experiences; preclinical students; qualitative

## 1. Introduction
Active engagement in preclinical research activities has been demonstrated to assist the growth of a variety of essential skills, including time management, problem-solving, information searching, critical thinking, and reasoning (Salam

---

[*]Corresponding author: *Nurfarahin Nasri; nurfarahinnasri@yahoo.com*

et al., 2015; Patel et al., 2019). Numerous existing studies confirm that the interaction or relationship between the student and supervisors is one of the most important elements of a successful research engagement (Rees et al., 2020; Hart et al., 2022). Given the challenges and competing interests of designing an effective and sustainable research programme for the preclinical students, it is therefore essential to look into how they experience research supervision, particularly with regards to feedback channels.

The recent COVID-19 pandemic has posed an additional challenge to continuing the delivery of the research programme (Finn et al., 2022). According to Barrot et al. (2021), transitioning into an online learning environment is challenging on many different levels. For instance, educational institutions struggled to develop teaching governance policies; educators felt pressured to adopt technology despite lacking technological competence; and students faced a higher risk of dropouts due to a variety of reasons. Moreover, feedback issues in online learning were described as ineffective time management, poorly coordinated communication, delayed feedback, and unclear instructions or expectations (Jensen et al., 2021). Despite the fact that nearly everything can be learned by students online, learning may not always be at its best, particularly for research programmes that call for direct engagement and face-to-face supervision (Zaheer & Munir, 2020).

For these reasons, this study investigates the impact of the COVID-19 pandemic on traditional research supervision by examining preclinical students' experiences with and perspectives on various feedback channels during online research supervision, as well as how it influences their research activities. Based on the qualitative findings, this study proposes using a variety of combination of feedback channels when conducting online research supervision, as this approach was found to be effective in meeting the individual student's learning needs, helping the students to complete their research or theses while providing them with sufficient socio-emotional support to advance and focus on their learning.

## 2. Literature Review
This section provides an elaborative discussion or review of literature that is pertinent to the aim of this study. This section is divided into three subsections: feedback, research supervision, and community of inquiry (CoI) framework.

### 2.1 Feedback
Feedback serves the purpose of improving students' learning, and proper use of feedback should lead to better learning (Jug et al., 2019). In order to enhance students' learning and to ensure a positive impact of feedback on learning, feedback should have specific characteristics that are associated with constructive formative functioning. First, feedback must include comprehensive recommendations for improving the learning task (Gray et al., 2022). Second, feedback should encourage students to reflect on their learning progress, particularly when considering necessary improvement strategies (Zhang, 2022). Third, feedback must acknowledge the effort being put into achieving a learning task rather than simply focusing on cognitive ability or personality (Mahoney et

al., 2019). Fourth, students must be able to act on feedback in order to improve their learning performance (Winstone et al., 2017). Fifth, feedback strategies should aim to shift students' high dependence on an educator's feedback towards self-generating their own feedback (Carless, 2019). This study views these characteristics as the antecedents for effective feedback to improve students' learning experiences.

Influenced by the perspective of feedback as a meaningful dialogue between students and educators to support current and future learning (Jensen et al., 2021), feedback can therefore be considered a socially constructed process. This understanding implies that students' past or current feedback experiences can influence their perception, and to a great extent, shape their individual improvement strategies in learning (Mahoney et al., 2019). Within an online learning environment, where both students and educators are not physically present, dialogic feedback is sent through different forms of channels, namely digital written text, voice, or video (Martin et al., 2020).

Moreover, factors influencing students' perceptions on particular online feedback channels vary depending on the conditions in which the study takes place (Espasa et al., 2022). For example, some studies reported that students preferred audio feedback over written feedback because the former is perceived to be more personal, and thus promotes a greater feeling of engagement (Morris & Chikwa, 2016). Another group of studies found that the majority of students preferred a combination of audio and video feedback because it increases students' learning satisfaction, fosters emotional engagement, enhances motivation and resiliency, and decreases the feeling of isolation (Rasi & Vuojärvi, 2018; Johnson & Cooke, 2016). Although there is a growing body of literature investigating the impact of feedback on online teaching and learning activities (Wei et al., 2020; Winstone et al., 2017; Mahoney et al., 2019; Carless & Boud, 2018), little research has been done to examine how preclinical students experience feedback channels within the specific context of online research supervision.

## 2.2 Research Supervision
According to Stelma and Fay (2012), supervision includes a combination of pedagogical and psychological knowledge of teaching and necessitates close engagement between students and supervisors in discussing the students' research project or dissertation work. Fundamental to the idea of supervision, the role of supervisors is three-fold; they are accountable for facilitating students' research work, evaluating and monitoring students' research progress, and acting as a mentor that provides emotional support and encouragement with the ultimate goal of ensuring that the students achieve their goal (Blythe, 2018). On the other hand, students are responsible for the successful completion of their research under the professional guidance of their supervisors. Taking part in a supervision requires students to effectively and cognitively engage with supervisors' feedback on academic work. Ideally, students that take an active role and establish a collaborative relationship with their supervisors are more likely to become competent and independent researchers (Fan et al., 2019). Therefore, this
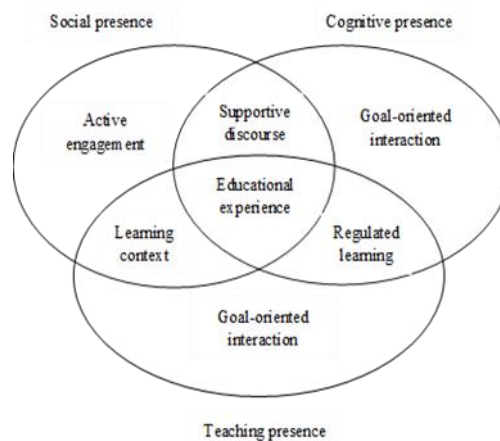
study stresses the primary purpose of supervision, which is to steer and support students' research by providing specific academic guidance and practical advice.

However, due to the rapid advancement of technology, supervisors have begun to widely adopt online research supervision by utilising appropriate technologies that enable effective digital communication. Although online research supervision has long been practised across institutions around the world, there has recently been renewed interest among researchers, particularly in terms of supporting students' research projects amid a global health emergency (Throne & Bourke, 2022). This is especially important for medical education providers because producing a newer generation of physician-scientists can help bridge the gap between research outcomes and clinical practices, resulting in significant growth in the field (Jacobs et al., 2022).

Price and Money (2002) identified three categories of online supervision, namely remote supervision where students and supervisors are geographically distant and communication depends greatly on the utilisation of technology as students are physically separated from their supervisors, traditional supervision where students and supervisors are geographically co-located in which face-to-face interaction occurs on the campus, and semi-remote supervision where it incorporates a combination of remote and traditional supervision. With this knowledge, the study operationalises online research supervision as a remote practice that include synchronous or asynchronous approach through the use of multiple feedback channels such as text, voice or video in supporting students' research works.

## 2.3 Community of Inquiry (CoI) framework

The Community of Inquiry (CoI) framework is both a theoretical framework and a process model developed by Garrison et al. (2000). The CoI framework provides an engaging and meaningful learning experience based on a collaborative and constructive relationship (Garrison, 2017). Of the numerous frameworks, this framework was selected because it is the most significant framework that informs research on online learning and the practice of online instructions (Yu & Li, 2022) and is thus highly relevant to the current study. Figure 1 depicts the CoI framework that illustrates the educational experience that takes place at the confluence of social, cognitive, and teaching presence.

**Figure 1: The Community of Inquiry (CoI) framework**
**(Garrison et al., 2010)**

According to Garrison et al. (2010), a productive online learning environment in which knowledge is constructed depends on three forms of presence. First, social presence that describes students' ability to be recognised by the community, to participate in meaningful communication, and to establish trust-based interpersonal relationships. Second, cognitive presence, whereby students' ability to be observant and reflective in constructing meaning. Third, teaching presence which involves designing, facilitating as well as directing both cognitive and social processes to ensure individual learning goals are achieved.

Within the CoI framework, both teaching presence and social presence can enhance students' cognitive presence (Garrison et al., 2010). Educators can create an interactive learning environment where students can express their ideas, share knowledge, and help each other, which strengthens their cognitive presence. The students can also increase their confidence by exchanging thoughts with their educators and peers. Therefore, educators, in their capacity as supervisors, can encourage students to complete the course or programme assignment by enhancing their self-regulation and ensure advancement by monitoring the students' performances (Yu & Li, 2022).

Based on these explanations, the CoI framework offers this study a means to consider the components of successful online research supervision, which comprise elements of social presence, cognitive presence, and teaching presence. These elements are used to help explain the various use of feedback channels to promote the research projects of preclinical students. Most importantly, this framework serves as a good anchor for viewing online research supervision as a form of online learning experience for preclinical students to grasp knowledge and skills related to their research. The CoI framework is also a useful tool for determining what and how different feedback channels fit into an online research supervision.

## 3. Methodology
This qualitative study adopted the narrative research design to understand the lived experiences of preclinical students who engaged in online research

supervision. More specifically, the focus of this study was to explore how preclinical students experienced different feedback channels during online research supervision. A qualitative methodological framework was selected for this study as it closely aligned with the exploratory aim and purpose of this study (Peterson, 2019). This study was guided by two research questions:

(1) How do preclinical students experience different feedback channels during online research supervision?
(2) What are their perspectives towards different feedback channels during online research supervision?

### 3.1 Setting

This study took place at two separate medical schools from two Malaysian research universities that offered Doctor of Medicine (M.D.) programmes. These universities were selected as they had a specific niche in research and showed interest in improving their online research supervision for their preclinical students. These students underwent mandatory 16-week research rotations that spanned a whole semester. During these rotations, they were paired with at least one research supervisor, who was in charge of selecting their research topics, assisting them with their research, and helping them write their theses. The supervisors gained full control over selecting the best channels for feedback, which led to a wide range of feedback approaches across the preclinical research activities at the universities. Prior to the COVID-19 pandemic, the students had full access to the library's resources and could schedule meetings with their supervisors at the faculties. However, the national movement control order that was announced due to the worsening pandemic forced the students to leave their faculties and continue learning from home.

### 3.2 Sampling

Purposive sampling was used to recruit participants for this study for several reasons. First, the sampling method allowed the identification and selection of information-rich target participants. Second, given the challenging circumstances, the sampling method was appropriate in selecting participants who showed willingness to contribute their perspectives via online. The selection criteria were, namely (1) preclinical students undergoing active research rotation and (2) students undergoing remote research supervision. An initial group of 232 preclinical students showed interest in participating in this study. However, only 113 preclinical students (n=66 females, n=47 males) submitted their informed consent forms and were included in this study.

### 3.3 Data Collection and Analysis

Several focus group discussions (FGDs) were conducted, each with a minimum of three and a maximum of six participants. FGD was decided because it helps participants feel more at ease and encourage them to openly share their experiences (Hennink et al., 2019). Moreover, a semi-structured interview format was chosen as it allows for a flexible yet focused approach to collect qualitative data (Brown & Danaher, 2019). The FGD sessions were guided by two topics, from which a series of questions were designed that corresponded to the related topics. The first topic sought to elicit participants' experiences in receiving feedback via

various channels during online research supervision, as well as how participants acted on the feedback provided. The second topic involved understanding the participants' perspectives on the impact of different feedback channels on their research work. All sessions lasted for about 45 minutes to an hour, via the Zoom platform and were recorded. The sessions were mainly conducted in English; however, the participants were free to speak in Bahasa Malaysia. The flexible use of both languages was intended to make the students feel more comfortable to express their ideas without being constrained by their speaking proficiency.

During the analysis stage, the recordings were manually transcribed verbatim transcribed and translated where necessary. Manual transcription was considered more efficient than using other assistive technologies as two of the research members are qualitative research specialists and had extensive experience in the area. The translation process was conducted by one of the research members who is an expert in Teaching English to Speakers of Other Languages (TESOL). The transcripts were later analysed using a hybrid inductive and deductive approach. This hybrid analytical approach is helpful in assisting the researchers in identifying findings based on prior literature while also allowing for the emergence of new findings and protecting against the loss of key findings (Fereday & Muir-Cochrane, 2006). Inductive analysis was data-driven and enabled the emergence of novel insights, whereas deductive analysis used theory-driven structures and sought to identify existing issues. A codebook that described each code with a concrete definition and quotes from the transcripts served as the main document of reference to guide the coding process. The process of coding and categorising was conducted within and across the transcripts. Similar patterns and differences in the findings were carefully noted. Relevant themes that emerged were then constantly compared to capture the interrelatedness and complexities that existed in the data.

### 3.4 Trustworthiness
This study employed four strategies to establish overall trustworthiness (Mohamad Nasri et al., 2020). First, prior to executing the study, trust-based relationships between researchers and participants were established as the latter were kept informed about the goal of the study as well as their expected role. Furthermore, their identities would remain confidential, and pseudonyms were used to preserve anonymity. Second, to ensure that the transcripts were accurate, a two-round transcription approach was used, where the recordings were listened to and re-listened to check for any typographical errors. Third, participants were provided a copy of their respective transcript to validate whether their responses were accurately conveyed. Fourth, a hybrid analysis approach was adopted to analyse the data to prevent researchers from overlooking key themes.

### 3.5 Ethical Statement
Ethical review and approval were waived for this study, as this study involves no more than minimal risk to subjects. However, informed consents were obtained from each participant involved in the study.

## 4. Findings and Discussion

This section presents the three themes and their relevant discussions; which also included the interview extracts and a short summary of how the findings were related to the existing literature. The following table presents a description of each theme that emerged from the data analysis.

**Table 1: Description of themes**

| Themes | Description |
|---|---|
| Diversified personal input | The first theme presents students' varying learning needs, resources or conditions which all can influence their perceptions on particular feedback channels. |
| Responsive to socio-emotional needs | The second theme focuses on the capacity for one feedback channel in meeting the socio-emotional needs of the students. |
| Prompt for actions | The third theme describes the fact that feedback initiates student's responses in improving their research. |

### 4.1 Theme 1: Diversified personal input

All participants agreed that effective feedback from their supervisors had tremendously supported their progress in conducting their research. Despite the challenges of the pandemic, they revealed that their supervisors were very responsive in providing feedback through various channels, namely voice, text, and video. The majority of the participants preferred synchronous video feedback since it allowed them to attend a commonly shared virtual space with other students. These participants concurred that doing it this way would enable them to compare their own progress to the work of other students, which would further motivate them to pursue research-related activities. Examples of digital platforms used for synchronous virtual meetings include Zoom Meeting, Microsoft Teams, and Google Meet. For example, one participant stated that her supervisor would set up a Google Meet where other students could join and present their research progress.

> *"It is very exciting for me when she gathers all students under her supervision in one Google Meet. In this way I know how much I progress in comparison to my other colleagues. It is very easy to feel lost during this pandemic. So, from that I know if I'm going too slow or I'm progressing well."*

On the other hand, several participants perceived asynchronous video feedback as extremely useful, as they were able to listen to feedback while at the same time observing the indicators and markings made by their supervisors. This allowed them to determine exactly where and how they needed to improve their thesis writing. The participants also reported that they could easily incorporate or reproduce the remarks into their original work using a specific application and thus save much of their time. In this way, they acquired sufficient time to further make amendments to their research work.

> *"I don't have to spend much time watching and rewatching the video to know what the comments are really about. I can just use some online*

*apps, and the apps can duplicate the comments into my writing. So, it's very time efficient, something I really need during the pandemic."*

*"I prefer this type of video as I can directly use the comments made by my supervisor to improve my writings. I do not need to physically copy them one by one and this saves my time so I can use the extra time to read more about the topics that my supervisor asks me to work on."*

Surprisingly, some participants showed a greater preference for receiving written feedback. According to this group of participants, written feedback demonstrated their supervisors' commitment to analysing their work in greater depth and provided an opportunity for them to reflect on their research decisions. They could also revisit the feedback multiple times to fully comprehend the comments or suggestions made by their supervisors and revise their work as needed. These participants said that written feedback was the best form of feedback for their individual conditions because they were unable to attend virtual meetings due to other conflicting commitments, especially when they needed to care for their younger siblings because their parents worked from home and some did not have good Internet connections at their homes. Additionally, participants who had been hospitalised or placed in isolation in public quarantine halls believed that receiving written feedback really aided in enabling them to carry on with their research work despite being in difficult circumstances.

*"I prefer written feedback because to be honest, I don't have time to prepare and get ready for a virtual supervision session. My working parents expect me as the oldest to care for my younger sisters, so it's very hard to juggle during this time".*

*"I like written feedback because I don't feel pressured to attend any online meetings. Not that I do not prefer these meetings but sometimes the situation makes it hard for me to be present in those meetings. I've once been isolated at the public quarantine centre for four weeks. I do not have the space and it has always been noisy and busy at the centre."*

These findings confirm that preclinical students face additional challenges in completing their research during the pandemic. Some had the privilege to receive video feedback through synchronous virtual meetings, while others were experiencing health problems and conflicting commitments. This proves the fact that these students may require different feedback channels, depending on their living conditions and their health status. Preclinical students who have group supervision tend to value peer feedback more and embrace social presence when exchanging ideas in groups (O'Connell et al., 2022). This resonates with the idea and understanding that feedback is a socially constructed process. On the other hand, asynchronous video feedback and written feedback are considered to be more effective for preclinical students who struggle to maintain work-life balance during the pandemic, as this way provides more time and flexibility. This may portray feedback as occurring in isolation during the pandemic, but this feedback channel allows them to keep working on improving their research.

**4.2 Theme 2: Responsive to socio-emotional needs**

Participants who received synchronous video feedback specifically described their experiences as though they were having in-person conversations in real time. The participants stated that their supervisors not only provided feedback on their work but also encouraged them to overcome challenges brought on by the pandemic. Aside from guiding them to continue their research or write their thesis, the supervisors offered comforting words for the participants, encouraging them to maintain a positive attitude and prioritise their mental as well as their social well-being. As a result, receiving synchronous video feedback along with pertinent life advice was seen as a successful technique for fulfilling the participants' socio-emotional needs. This was helpful as the participants could not afford to attend counselling sessions during the pandemic.

> *"The video feedback not only tells me what I need to improve but it also provides me a soothing sense where I need to challenge myself and stay resilient to get through this difficult time."*

> *"Just by seeing the face of my supervisor and the rest of my friends is good enough to put a smile on my face. Studying from home can be very lonely for me. Both of my parents are doctors so they are fighting the war outside. They rarely come back home. So, I'm happy to see familiar faces."*

Regardless of the feedback channels, many participants reported that they often viewed their supervisors as their life coaches because they gave them enlightening words of wisdom and inspirational comments. This true, selfless behaviour was very valuable because the participants had a very challenging time keeping on top of their work because they were physically isolated from their colleagues and had to cope with the pandemic's added challenges. Following this, the participants felt the need to show their appreciation by producing high-quality research, which could be achieved by taking into account the feedback given to them.

> *"I don't know how to describe it. This little act may not carry so much weight pre-pandemic, but I need them the most during this time. Sometimes it feels quite suffocating, especially because I'm doing the research alone. So, to know that someone out there knows my struggle is very comforting."*

> *"It genuinely warms my heart to see how much my supervisor cares about me by encouraging me to take good care of my health and think optimistically. She somehow comes across as being extremely genuine in her advice. That makes me feel incredibly grateful, and I feel like I should thank her by doing the research and acting on her feedback."*

These findings show that synchronous video feedback has the potential to increase positivity and resiliency among preclinical students throughout the pandemic. In addition to providing feedback to help students improve their research work, these findings underline the significance of synchronous video feedback in providing socio-emotional support for preclinical students, particularly at this crucial time. This is in line with the global resolution for all educational institutions to place students' socio-emotional health as their top concern throughout the pandemic (Zieher et al., 2021). Since students are expected

to take on a variety of tasks in daily life, which adds strain and stress, they are particularly susceptible to experiencing declining mental and emotional health during this critical period.

### 4.3 Theme 3: Prompt for actions

All participants were satisfied with their online research supervision experiences, especially because the feedback they received was useful and constructive, and it inspired them to take action in improving their research works. Since the participants were aware that they might not have extensive experience in conducting research, having supervisors who were willing to guide them and provide suggestions for them made them feel more interested in doing research works. For instance, some supervisors had gone a step further and paid for a subscription so that the participants could analyse their data in a more time-efficient manner. Since the participants understood that their supervisors had gone above and above to assist them in finishing their research, they felt more compelled to respond to their supervisors' criticism.

> "My supervisor sponsored Atlas.ti for me to analyse my data more efficiently and this software saves me a lot of time. I really appreciate her good will and now I know that she sincerely wants me to learn and complete my research, and thus I take her feedback more seriously."

> "I'm glad that my supervisor is well aware of the difficulties I have when conducting my research remotely. She was aware that the students she was supervising were not well off and could not afford a monthly internet plan. She purchased a one-year group subscription internet plan for us to use to complete our research. That made me feel more driven to work on her feedbacks."

Moreover, knowing that their supervisors empathised with their study conditions made them feel stronger to face the additional challenges they faced in completing their research during the pandemic. Despite the fact that the participants claimed their supervisors gave them a strict deadline to meet in order to advance their research on time, they claimed that in reality, their supervisors were accommodating and understanding. The participants further discussed that, upon receiving feedback, they could quickly develop an action plan either to address the relevant comments or to strengthen their justification for their research decision. This would involve them communicating their concerns to their supervisors and negotiating their future plan.

> "Feedback without action would lead to nowhere. So, any feedback, either video or written, should result in action. So, my supervisor did well to keep me on track".

> "My supervisor assigns me a number of due dates so she can keep track of how I'm doing. That's OK, and I appreciate her flexibility on the matter. She is aware of the struggles I'm having at home. She says she is more than happy as long as I deliver some works. I still have room to negotiate my future plan by taking in her feedbacks and communicating my concern."

This finding emphasises the importance of feedback in generating prompt actions for preclinical students to follow through on in order to improve their work. The feedback motivates the students to take additional actions, demonstrating that feedback does not have to come solely from supervisors, as these students' current practice has allowed them to develop into self-directed learners capable of self-planning, self-assessment, and self-monitoring to improve their own work (Wong et al., 2019).

## 5. Implications for Practice

Preclinical students need a lot of feedback to get through their research rotations because they are required to work on their projects in a variety of settings, including critical wards, day care centres, rehab centres, or public spaces, as well as handle a tonne of complex clinical data. This study hopes to shed some light on the importance of understanding the experience of receiving feedback during online research supervision from the perspective of preclinical students. In general, this study shows that the current method of online research supervision used during the pandemic has the potential to promote the growth of positive relationships between supervisors and students. Despite requiring remote research supervision, there is evidence that knowledge sharing and feedback are efficiently communicated in accordance with each student's circumstances.

This study makes a major contribution in the area of online research supervision as it reveals that personalisation remains the key to sustaining effective feedback in order to foster positive outcomes among preclinical students who are in their research rotations. The students' in-depth perceptions towards different feedback channels, such as through asynchronous video, synchronous video, or written text, are consistent with the CoI framework as their experiences cover either the social, teaching, or cognitive presence. This shows the importance of applying different feedback channels as one way to keep the students engaged in their research. Despite synchronous video feedback was favourably received by the vast majority of preclinical students due to its capacity to foster social presence, this channel might not be as useful for other students who encountered challenging conditions. These findings therefore provide strong evidence that tailoring feedback channels to students' learning needs and their available resources is essential to assisting them in advancing their research work.

In addition to serving the primary objective of improving the quality of students' research or theses, it can be claimed that selecting an appropriate combination of feedback channels is vital for increasing students' motivation and attitude toward research while also giving them socio-emotional support during challenging periods. More importantly, despite the fact that preclinical students' preferences for feedback channels vary based on their individual living conditions or circumstances, this study is able to establish that such variances should be understood by the supervisors to assist personalisation for each student. Even though the focus of this study was preclinical students' perceptions and experiences with various feedback channels during online research supervision, the findings have practical implications for supervisors, particularly in selecting or personalising feedback channels for the students.

In this case, this study offers the following recommendations for supervisors to take into account when conducting remote online research supervision for preclinical students:

1. A feedback channel could be highly effective for one student but ineffective for another. Consider and personalise the use of feedback channels that do not put extra pressure on students. Gather information about students' living conditions, health conditions, or resources prior to choosing any feedback channel.

2. Synchronous video feedback is useful in nurturing a social and caring learning environment to support active students' engagement in research. By encouraging critical reflection on other students' work, it also helps students develop their own insight into their research work.

3. Asynchronous video feedback and written feedback work extremely well for students who have conflicting commitments, a lack of resources, or are physically ill. It is important for supervisors to explore different possibilities for helping the students continue their research and complete their rotations. Additional support may be given to help them thrive despite the poor conditions.

## 6. Conclusion

The findings of this study give an in-depth and authentic account of preclinical students' engagement with feedback channels during online research supervision. Based on the qualitative findings, this study promotes an understanding of how to view an effective online research supervision as having the capacity to utilise various feedback channels in terms of providing diversified personal input, being responsive to socio-emotional needs, and prompting for action. More particularly, this study emphasises that integrating several feedback channels is fundamental to effective online research supervision. However, no specific combination of feedback channels is shown to be successful for all students. The recommendations made in this study can be used as a guide for supervisors to concentrate on tailoring feedback channels in response to specific students' learning needs and circumstances during remote online research supervision.

Finally, there are several limitations that should be addressed in this study. Firstly, our qualitative findings are not generalisable to a larger population. However, we never intended to generalise our findings but rather to offer a comprehensive understanding of the phenomenon, which is in line with the purpose and aim of analysing a social phenomenon from a qualitative, interpretivist paradigm. Additionally, we argue that some of the experiences described in this study might resonate with other students who are participating in online research supervision. Secondly, this study focuses mostly on various feedback channels rather than examining how they can promote positive relationships between students and supervisors. As a result, we encourage more study to examine the relationship between students and supervisors in the setting of online research supervision.

**Acknowledgement**

## 7. References

Barrot, J. S., Llenares, I. I., & Del Rosario, L. S. (2021). Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. *Education and information technologies*, *26*(6), 7321-7338. https://doi.org/10.1007/s10639-021-10589-x

Blythe, S. (2018). The research supervisor as friend. *Practical Theology*, *11*(5), 401-411. https://doi.org/10.1080/1756073X.2018.1536353

Brown, A., & Danaher, P. A. (2019). CHE principles: Facilitating authentic and dialogical semi-structured interviews in educational research. *International Journal of Research & Method in Education*, *42*(1), 76-90. https://doi.org/10.1080/1743727X.2017.1379987

Carless, D. & Boud, D. (2018). The development of student feedback literacy: enabling uptake of feedback. Assessment & Evaluation in Higher Education, *43*(8), 1315–1325. https://doi.org/10.1080/02602938.2018.1463354

Carless, D. (2019). Feedback loops and the longer-term: towards feedback spirals. *Assessment & Evaluation in Higher Education*, *44*(5), 705-714. https://doi.org/10.1080/02602938.2018.1531108

Espasa, A., Mayordomo, R. M., Guasch, T., & Martinez-Melo, M. (2022). Does the type of feedback channel used in online learning environments matter? Students' perceptions and impact on learning. *Active Learning in Higher Education*, *23*(1), 49-63. https://doi.org/10.1177/1469787419891307

Fan, L., Mahmood, M., & Uddin, M. (2019). Supportive Chinese supervisor, innovative international students: A social exchange theory perspective. *Asia Pacific Education Review*, *20*(1), 101-115. https://doi.org/10.1007/s12564-018-9572-3

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, *5*(1), 80-92. https://doi.org/10.1177/160940690600500107

Finn, G. M., Crampton, P., Buchanan, J. A. G., Balogun, A. O., Tiffin, P. A., Morgan, J. E., Taylor, E., Soto, C., & Kehoe, A. (2022). The impact of the COVID-19 pandemic on the research activity and working experience of clinical academics, with a focus on gender and ethnicity: a qualitative study in the UK. *BMJ Open, 12*(6), e057655. https://doi.org/10.1136/bmjopen-2021-057655

Garrison, D. R. (2017). *E-Learning in the 21st Century: A Community of Inquiry Framework for Research and Practice* (3rd Edition). Routledge. https://doi.org/10.4324/9781315667263

Garrison, D.R., Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *Internet and Higher Education, 13*(1), 5-9. http://dx.doi.org/10.1016/j.iheduc.2009.10.003

Garrison, D.R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text based environment: computer conferencing in higher education. *The Internet and Higher Education, 2*(2-3), 87-105. https://doi.org/10.1016/S1096-7516(00)00016-6

Gray, K., Riegler, R., & Walsh, M. (2022). Students' feedback experiences and expectations pre- and post-university entry. *SN Soc Sci 2*, 16. https://doi.org/10.1007/s43545-022-00313-y

Hart, J., Hakim, J., Kaur, R., Jeremy, R., Coorey, G., Kalman, E., Jenkin, R., & Bowen, D. (2022). Research supervisors' views of barriers and enablers for research projects

undertaken by medical students; a mixed methods evaluation of a post-graduate medical degree research project program. *BMC Medical Education*, *22*(1), 1-12. https://doi.org/10.1186/s12909-022-03429-0

Hennink, M. M., Kaiser, B. N., & Weber, M. B. (2019). What influences saturation? Estimating sample sizes in focus group research. *Qualitative Health Research*, *29*(10), 1483-1496. https://doi.org/10.1177/1049732318821692

Jacobs, R. J., Caballero, J., & Kane, M. N. (2022). Medical students' confidence in their abilities and barriers to conducting research: A mixed-methods study. *Cureus*, *14*(1), e20896. https://doi.org/10.7759/cureus.20896

Jensen, L. X., Bearman, M., & Boud, D. (2021). Understanding feedback in online learning–A critical review and metaphor analysis. *Computers & Education*, *173*, 104271. https://doi.org/10.1016/j.compedu.2021.104271

Johnson, M. G., & Cooke, A. (2016). Self-regulation of learning and preference for written versus audio-recorded feedback by distance education students. *Distance Education, 37*(1), 107–120. http://doi.org/10.1080/01587919.2015.1081737

Jug, R., Jiang, X. S., & Bean, S. M. (2019). Giving and receiving effective feedback: A review article and how-to guide. *Archives of Pathology & Laboratory Medicine*, *143*(2), 244-250. https://doi.org/10.5858/arpa.2018-0058-ra

Mahoney, P., Macfarlane, S., & Ajjawi, R. (2019). A qualitative synthesis of video feedback in higher education. *Teaching in Higher Education*, *24*(2), 157-179. https://doi.org/10.1080/13562517.2018.1471457

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education*. 159, 104009. https://doi.org/10.1016/j.compedu.2020.104009

Mohamad Nasri, N., Nasri, N., & Abd Talib, M. A. (2020). Cross-language qualitative research studies dilemmas: A research review. *Qualitative Research Journal*, 21(1), 15-28. https://doi.org/10.1108/QRJ-12-2019-0093

Morris, C. & Chikwa, G. (2016). Audio versus written feedback: exploring learners' preference and the impact of feedback format on students' academic performance. *Active Learning in Higher Education, 17* (2), 125-137. https://doi.org/10.1177/1469787416637482

O'Connell, E. L., Langborne, S., Habib, G., Davis, A., & Wong, D. (2022). Early career psychologists "muddling through the same challenges": how the experience of structured group supervision can support the transition to work. *Clinical Psychologist*. Advance online publication. http://dx.doi.org/10.1007/s10879-011-9198-9

Patel, S., Walsh, C. M., & Udell, J. A. (2019). Exploring medically-related Canadian summer student research programs: a National Cross-sectional Survey Study. *BMC Medical Education*, *19*(1), 1-9. https://doi.org/10.1186/s12909-019-1577-z

Peterson, J. S. (2019). Presenting a qualitative study: A reviewer's perspective. *Gifted Child Quarterly*, *63*(3), 147-158. https://doi.org/10.1177/0016986219844789

Price, D. C., & Money, A. H. (2002). Alternative models for doctoral mentor organisation and research supervision. *Mentoring & Tutoring: Partnership in Learning*, *10*(2), 127–135. https://doi.org/10.1080/1361126022000002446

Rasi, P. & Vuojärvi, H. (2018). Toward personal and emotional connectivity in mobile higher education through asynchronous formative audio feedback. *British Journal of Educational Technology, 49*(2), 291–304. https://doi.org/10.1111/bjet.12587

Rees, C. E., Davis, C., King, O. A., Clemans, A., Crampton, P. E., Jacobs, N., McKeown, T., Morphet, J., & Seear, K. (2020). Power and resistance in feedback during work-integrated learning: contesting traditional student-supervisor

asymmetries. *Assessment & Evaluation in Higher Education*, *45*(8), 1136-1154. https://doi.org/10.1080/02602938.2019.1704682

Salam, A., Hamzah, J. C., Chin, T. G., Siraj, H. H., Idrus, R., Mohamad, N., & Raymond, A. A. (2015). Undergraduate medical education research in Malaysia: Time for a Change. *Pakistan Journal of Medical Sciences*, *31*(3), 499–503. https://doi.org/10.12669/pjms.313.7389

Stelma, J., & Fay, R. (2012). Intentionality and developing researcher competence on a UK master's course: An ecological perspective on research education. *Studies in Higher Education*, *39*(4), 517-533, https://doi.org/10.1080/03075079.2012.709489

Throne, R., & Bourke, B. (2022). Online research supervisor engagement: Fostering graduate student researcher positionality. In *Research Anthology on Doctoral Student Professional Development* (pp. 398-412). IGI Global. https://www.igi-global.com/book/research-anthology-doctoral-student-professional/296275

Wei, W., Sun, Y. & Xu, X. (2020). Investigating the impact of increased student feedback literacy level on their expectations on university teachers' feedback. *Assessment & Evaluation in Higher Education*, *46*(7), 1092-1103. https://doi.org/10.1080/02602938.2020.1846017

Winstone, N. E., Nash, R. A., Parker, M., & Rowntree, J. (2017). Supporting learners' agentic engagement with feedback: a systematic review and a taxonomy of recipience processes. *Educational Psychologist*, *52*(1), 17–37. https://doi.org/10.1080/00461520.2016.1207538

Wong, J., Baars, M., Davis, D., Van Der Zee, T., Houben, G. J., & Paas, F. (2019). Supporting self-regulated learning in online learning environments and MOOCs: A systematic review. *International Journal of Human–Computer Interaction*, *35*(4-5), 356-373. https://doi.org/10.1080/10447318.2018.1543084

Yu, Z., & Li, M. (2022). A bibliometric analysis of Community of Inquiry in online learning contexts over twenty-five years. *Education and Information Technologies*, *27*(8), 11669-11688. https://doi.org/10.1007/s10639-022-11081-w

Zaheer, M., & Munir, S. (2020). Research supervision in distance learning: issues and challenges. *Asian Association of Open Universities Journal*, *15*(1), 131-143. https://doi.org/10.1108/AAOUJ-01-2020-0003

Zhang, Z. (2022). Promoting student engagement with feedback: insights from collaborative pedagogy and teacher feedback. *Assessment & Evaluation in Higher Education*, *47*(4), 540-555. https://doi.org/10.1080/02602938.2021.1933900

Zieher, A. K., Cipriano, C., Meyer, J. L., & Strambler, M. J. (2021). Educators' implementation and use of social and emotional learning early in the COVID-19 pandemic. *School Psychology*, *36*(5), 388-397. https://doi.org/10.1037/spq0000461