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Improving the Pedagogical Skills of PASS Leaders on the Job with Synchronous Feedback: A Feasibility Study

ABSTRACT

Peer assisted study sessions (PASS), also known as supplemental instruction, are structured peer guided sessions linked to a specific course, led by experienced and trained students called PASS-leaders. These PASS-leaders undergo several days of training before running their first session and receive supervision and feedback "on the job." Research suggests that training improves student outcomes whereby supervision is considered best practice, as required by PASS protocols. However, it is unclear what type of supervision best supports PASS-leaders. Thus far, studies have not compared different methods for on-the-job training. Current practice involves supervisors observing PASS sessions without intervening but providing post hoc feedback. While this prevents undermining the PASS leaders, it delays their ability to act on feedback. This study, carried out at an institution for initial teacher education, developed and tested a method for providing immediate feedback using a bug-in-ear device linked to a live-stream. Six PASS-leaders were observed during four to six sessions each, receiving either synchronous feedback with a bug-in-ear or in-person asynchronous post hoc feedback. In group interviews PASS-leaders reported appreciating the immediacy of synchronous feedback which allowed them to act in real-time. The surveys after each lesson indicated that they felt significantly more confident about teaching following live feedback. They described the supervisor as an invisible helper, providing support or assistance. Because the bug-in-ear method could only provide feedback on visible instructional and pedagogical actions, both PASS-leaders and PASS-supervisors recommended using this as a supplement to a pre-session briefing and a post-session debrief.

KEYWORDS

peer learning, pedagogical skills, PASS, synchronous feedback, higher education

INTRODUCTION

Peer assisted study sessions (PASS), also known as supplemental instruction (SI), are a structured form of peer learning attached to high-risk courses and complementary to classes from faculty. PASS are small group sessions in which collaborative learning strategies are facilitated by a trained peer who has already successfully completed the course. Since its inception in 1973, PASS has been widely implemented around the globe to facilitate active learning and student performance and retention (Dawson et al. 2014). This form of near peer learning works on the condition that the peers providing support, the so-called PASS-leaders, have sufficient content and pedagogical skills to offer to their peers (Dekker et al. 2023a). PASS-leaders are trained for their tasks by qualified PASS-supervisors. PASS-supervisors are university employees (teachers or support staff) who have undergone supervision training at the international or regional SI-PASS centre. During their training, PASS-leaders learn to design lesson plans with a pre-structured template and practise pedagogical

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skills that promote active learning. The PASS-leader typically does not provide the answers but helps students figure out how to get to the answers themselves, for example by redirecting questions. After two to four days of training, the PASS-leaders plan and host their first sessions. According to the International Center for SI, it is essential that the PASS-leaders' sessions are regularly observed by a supervisor who provides feedback in order to ensure correct implementation and ongoing professional development (Zhan 2022). This prevents "program drift" and ensures that the PASS sessions retain their methodological setup instead of becoming regular tutoring sessions, for example (International Center for Supplemental Instruction 2019).

Much of the PASS literature (e.g., Wheeler, Maeng, and Whitworth 2015; 2016) shows that many peers find it hard to learn and apply the pedagogical skills required for supporting active learning instead of directly providing answers or lecturing students. These complex skills, such as knowing when to wait, and knowing when to intervene without taking over, are mostly learned on the job. The feedback that supervisors provide post hoc after observing does not allow an opportunity for the PASS-leaders to apply the new insights instantly. This makes it a matter of speculation as to whether the suggested action would have improved the session.

A recent review of near-peer teaching in higher education by Dekker et al. (2023a) found that training and supervision of peer leaders are important conditions for success. Their review underscored that we have insufficient insight into the optimal ways to prepare and support near-peer leaders for their role, because different types of preparation or supervision are not usually compared. As far as can be ascertained from existing reviews, this study is the first to compare different types of supervision for PASS-leaders (Dawson et al. 2014; Dekker et al. 2023a). The current study piloted an innovative method that could improve the pedagogical on-the-job training and the continuing development of PASS-leaders without undermining the working mechanisms of PASS.

BACKGROUND

Theorising peer learning and professional development of near-peer teachers

Structured forms of peer learning in higher education have proliferated since the second half of the twentieth century, because they allow for relatively cost-effective ways to provide active forms of learning for an increasing influx of students (Dekker, Koerhuis-Pasanisi, and Koek 2024). Near-peer teachers are theorised to have specific advantages over regular staff because of cognitive and social congruence: cognitively they speak the language of the learner, and socially they are more approachable and empathise more easily when their peers' do not understand course content that they also recently struggled with (Loda et al. 2019). They are, however, usually not yet trained or qualified as a domain expert or teacher, which makes them less suited to providing summative feedback or presenting new concepts to peer students. The most frequently studied forms of peer learning compensate for this by providing introductory courses, structured formats for study sessions, and/or supervision (Dekker et al. 2023a). During their introduction and with the structured formats and supervision, near peers often learn to act as a guide or facilitator of learning rather than an instructor who provides theory and answers. By helping students discover how to find the answers themselves, the peer helps the students to adopt better study strategies (Dekker, Koerhuis-Pasanisi, and Koek 2024). In PASS, the PASS-leaders do this by using collaborative learning strategies and applying pedagogical techniques that support students to think for themselves.

PASS leader feedback

The aforementioned recent systematic literature review by Dekker et al. (2023a) on near-peer guidance (which includes both PASS and peer assisted learning, provided by both undergraduate and graduate peers or teaching assistants), found that preparation and supervision are important conditions for quality facilitation and learning gains for both students and PASS leaders. Research into the different types of training and supervision, however, compared training with no training (De Smet et al. 2010; Horneffer et al. 2016; Johansson et al. 2018), or teaching confidence before and after the training (e.g., Lufler, Lazarus, and Stefanik 2019). None of the 111 studies that Dekker et al. (2023a) included compared different types of supervision, such as written versus oral feedback, pre-brief versus debrief, or synchronous versus asynchronous feedback. When supervision occurs, it usually means that a supervisor attends and observes the lessons and provides feedback afterward, or that near-peer teachers have a supervision session where they can discuss how to deal with challenges that occur during their sessions. Peer teachers identified feedback on teaching as a core component and highly appreciated it (Onorato et al. 2021). PASS supervision can consist of several components: lesson observations, PASS-planning briefs, group debriefs for leaders, or reflective reports after sessions with feedback from supervisors. Currently, it is not known which of these components is most effective and how this ideally should be implemented. A more in-depth investigation of some of the aforementioned types of supervision could help fill this gap and provide useful insight for supervisors and peer teachers.

PASS-leaders typically receive post hoc performance feedback. According to the supervisor manual of the International Center for Supplemental Instruction (2019), this should be done during the first three sessions and weekly from there on (less for more experienced “returning” leaders). Its “importance cannot be overstated” according to the manual because PASS-leaders could otherwise “struggle to use a variety of strategies” (International Center for Supplemental Instruction 2019, 53). The provision of weekly feedback needs to be considered against the backdrop of the massification and modularisation of higher education (Carless 2020), where PASS supervisors will also be juggling their own teaching and research obligations with their requirements to observe and provide feedback to the PASS-Leaders. Physically attending sessions for observation puts a strain on the workload of the supervisor. The manual provides an extensive observation form that includes statements such as “consistently and effectively checks for understanding” with a checkbox and ratings based on how many boxes are checked ranging from developing to skillful. It is, therefore, essential that PASS-leaders are responsive to feedback, i.e. that they have developed their feedback literacy (Carless and Boud 2018), in order to have a positive impact on the successful learning outcomes of peer students (Skalicky 2008). Feedback literate students become self-regulating lifelong learners who seek, process and use feedback from different sources (Carless and Boud 2018) so the focus of feedback practices in higher education should be on promoting learning rather than assuring assessment. Research suggests that both oral and written feedback are more effective than a grade or evaluation (Black and Wiliam 1998) and that insufficient or inadequate feedback may lead to inappropriate practice (Teo et al. 2015). For effective uptake, feedback should be timely, relevant, and contextualised. Yet most performance feedback is post hoc, i.e., provided outside of the target context, and may, therefore, be too late and lack clear guidelines resulting in a “gap in shared supervisor and mentor knowledge” (Hammill, Best, and Anderson 2015, 50). Research findings (e.g., Gander and Dann 2022; Kehrwald, Stahl, and Sharplin 2018; Scheeler, Morano, and Lee 2018) confirm the value of immediate and contextual performance feedback to help accelerate skills development.

Synchronous performance feedback

Immediate synchronous performance feedback (SPF) is feedback provided within three seconds of a particular behaviour within the context of that behaviour. It can be efficient and effective for changing instructional and pedagogical performance for preservice and in-service teachers and paraeducators on the receiving or providing end of the feedback in individual, small group, full class, and avatar teaching and learning environments (e.g., Coninx, Kreijns, and Jochems2013; Gander and Dann 2022; Horn et al. 2023; Scheeler, McKinnon, and Stout 2012), whilst being less intrusive than an additional physical presence in the class (Teo et al. 2015). It has been successfully implemented in peer teaching practice sessions in higher education, mainly for the practice of particular skills (e.g., Kehrwald, Stahl, and Sharplin 2018; Scheeler et al. 2009; Sharplin, Stahl, and Kehrwald 2016; Stahl, Sharplin, and Kehrwald 2016); to our knowledge, it has not yet been implemented directly in peer supervision settings, such as the PASS environment.

Technology can offer timeliness, convenience, and a potential solution for managing feedback practice in classroom settings (e.g., Carless and Winstone 2020; Gander and Dann 2022; Molloy, Boud, and Henderson 2020). Relatively cheap and easily accessible technology in the form of a so-called bug-in-ear device, a small Bluetooth earpiece linked to a camera and livestream, can be used to implement SPF for an individual actively engaging in the target task without loss of momentum (Scheeler, Morano, and Lee 2018). Practically, providing synchronous performance feedback allows the supervisor to conduct lesson observations without being physically present. This could relieve some of the workload for supervisors. Potential downsides of SPF include the technology-dependence of the method. Students and supervisors can be hesitant to use a method that is dependent on a stable internet connection and well-functioning materials. Additionally, wearing the bug-in-ear could be seen as contrary to classroom etiquette, given that wearing earphones is generally prohibited for students. PASS sessions, which typically involve peer-assisted study and collaborative learning strategies might benefit from incorporating SPF with a bug-in-ear. This instant feedback encourages active, dialogic collaboration with the supervisor and creates a more responsive learning environment since PASS-leaders can refine their skills in situ in response to received feedback. If it is not used for high-stakes feedback, i.e., a summative assessment is not part of the process, it is less likely to produce anxiety and more likely to be perceived as supportive and thus invoke a (re)action from the PASS-leader (Lipnevich, Berg, and Smith 2016).

Ingredients of synchronous performance feedback

Previous literature on SPF identifies two important conditions for its success: it should not undermine teaching confidence, and it should not lead to cognitive overload for the person receiving the feedback (Taylor, Oostdam, and Fukkink 2022). Given that the body of knowledge into feedback practices indicates that it not only impacts learning but also emotions, it is important to consider the cognitive angle of feedback and the psychological, relational aspects (Voerman et al. 2014). Both in the context of higher education teaching, and in the context of teacher education, performance feedback anxiety can still play a role (Dekker et al. 2023a; Gorospe 2022). Teaching confidence, the belief in one's capabilities to carry out the course of action required to achieve a desired outcome, is a component of teacher self-efficacy. This is a critical aspect of innovation and adaptability, even more so than content knowledge (Ertmer and Ottenbreid-Leftwich 2010). Teachers with more confidence are generally more effective in providing the instructional and affectional support necessary for positive learner outcomes (Zee et al. 2016). A lack of relatedness between the feedback giver (the PASS-supervisor) and recipient (the PASS-leader) can result in the recipient losing confidence in

teaching and failing to implement feedback (Ajjawi, Tai, and Dawson 2023); it is important that the feedback dyad (PASS-supervisor and PASS-leader) have a relationship of trust. The PASS-leaders must be willing to form learning partnerships and use feedback to experiment, cooperate, and alter their behaviour in order to improve their performance (Carless 2013; Scheeler, Morano, and Lee 2018).

For PASS-leaders, it is also important to realise this "multidimensionality, simultaneity, and immediacy" (Wolff, Jarodzka, and Boshuizen 2017, 142) of supervising peer sessions can already be cognitively challenging, so it is essential that SPF does not increase these challenges. To that end, the use of a feedback taxonomy, such as the Synchronous Online Feedback Taxonomy (SOFT, see appendix) (Taylor, Oostdam, and Fukkink 2022), focussed on visible performance could help add structure to the observation and feedback whilst allowing for individual and contextual differences and ensuring the message is timely, short, and focussed on improvement.

Synchronous online feedback taxonomy

Based on international teaching standards, the SOFT was designed to enable SPF for K–12 teachers and instructors and to ensure compliance with the principles of effective feedback. Although originally developed for pre-service teachers in K–12 education, this taxonomy could also be useful to peer teachers or teaching assistants in higher education if the terminology and performance descriptors are clear and intuitive enough for their context. The SOFT is organised using a simple structure that enables observers to focus on visible behaviour whilst providing simple and rapid feedback to the instructors. The SOFT comprises twenty feedback cues and distinguishes four feedback levels: feedback on the self, feedback on the task, feedback on the process, and feedback on self-regulation (Hattie and Timperley 2007). Task feedback cues resemble direct instructions, such as "instruct how long," whereas process cues require more agency, such as "check understanding." The short keyword cues in the SOFT can help avoid cognitive overload (Coninx, Kreijns, and Jochems 2013). In line with recommendations for SPF (Shute 2008), the SOFT should help the PASS-supervisor present feedback in manageable chunks and can help both PASS-leader and PASS-supervisor to focus on performance and learning goals. Since not all feedback is equal, and a taxonomy helps guide feedback whilst allowing for contextual personalisation, it is interesting and important to know the extent to which a feedback taxonomy may be used in combination with SPF in order to guide PASS-leader performance.

Current study

To that end, the purpose of this study was to conduct a feasibility study. Feasibility studies are designed to answer the overarching question: can it work? (Orsmond and Cohn 2015). The answer depends on the degree to which the intervention would be acceptable and useful to both PASS-leaders and PASS-supervisors. Therefore, we investigated the experiences of PASS-leaders and PASS-supervisors with synchronous and asynchronous performance feedback using a feedback taxonomy to guide feedback. The questions guiding this study include:

1. (How) can synchronous and asynchronous feedback using the SOFT be implemented for the supervision of PASS-leaders by PASS-supervisors?
2. What is the perceived impact of synchronous and asynchronous performance feedback on PASS-leaders' confidence in their facilitation skills?

METHOD

Participants and setting

This study was carried out at a Dutch university of applied sciences in the department of initial teacher education. When selecting participants, we included a convenience sample comprised of six

second-year undergraduates (four male, two female, mean age 25.5 years at start of study, *sd* 10.58) who volunteered to participate (see Table 1 for demographics). All participants were enrolled in a four-year undergraduate bachelor of education programme for lower secondary school (12–15 years) and vocational education (from 16 years) and were in their second year of study. Our sample is representative of the population of PASS-leaders at our university's department of initial teacher education. Recruitment took place through emails sent directly to the PASS-leader cohort. This group provided PASS to their first-year subject peers at the university. Additionally, two teacher educators who are also qualified PASS-supervisors (one philosophy teacher educator, one educational scientist) volunteered to carry out the observations and provide feedback. We used a sample size of six PASS-leaders because we wanted all participants to thoroughly experience both forms of feedback and had only two qualified PASS-supervisors available that semester. This meant supervisors observed and provided both synchronous and asynchronous feedback up to three times for all six PASS-leader respondents.

Learner participation in the PASS-sessions was optional, and the number of participants per session varied, though fewer than the average of 25 learners in regular classes at the initial teacher education department participated.

Table 1. Demographic information of PASS-leaders

PASS-leader pseudonym	Subject taught	Age at start of study
David	French	18 years
Nina	English	20 years
Mary	English	48 years
Michael	Economics	28 years
Robert	Maths	19 years
Anthony	Maths	20 years

Participants provided written consent to participate in the study after ethics was granted (UvA 2020-CDE-11987).

Materials

We equipped participants with the technology used to conduct observations and feedback, namely a Bluetooth earpiece with microphone connected to a laptop or mobile phone. For the synchronous and asynchronous performance feedback sessions, PASS-supervisors and leaders needed internet access since we used Microsoft Teams for the observations and recording. We placed a camera and microphone in the classroom so that the supervisor could observe and hear all participants.

Procedures and measures

Prior to the start of the study, we trained all participants in the use of the feedback taxonomy and the equipment. During a session lasting approximately 45 minutes, we presented participants with 22 lesson clips demonstrating visible instructional and pedagogical skills These lessons came from lessons of preservice teachers teaching in lower secondary (12–15 years) and vocational (15–25 years) education as examples of typical classroom practice and visible teacher behaviour. We selected 18 of the clips to represent the four feedback levels of Hattie and Timperley (2007) and to cover the cues in the SOFT. There were no clips for the self-regulation cue since lesson plans were not available to provide insight into any changes made to the planning, though these were discussed with the participants as part of the training. We also included four red herring clips, which did not require any

feedback. After each clip, we asked participants what feedback they would provide and what response they hoped to see. They subsequently looked at the SOFT to see if the feedback they had chosen was on the list.

Following this performance feedback training, participants practised setting up the equipment. This comprised a laptop or mobile telephone placed at the back of the classroom with the camera positioned in such a way that the PASS-leader and peers could be observed and heard through an open Microsoft Teams session which also recorded the session. The PASS-supervisor observed the session from another location through the web conferencing system and provided feedback to the PASS-leaders through the Bluetooth earpiece they wore in one ear during the session. The PASS-supervisors had their cameras off to minimise distractions, and the Bluetooth earpiece ensured only the PASS-leaders could hear the feedback.

We used a switched AB design in which we randomly assigned participants to one of the PASS-supervisors and either the synchronous or asynchronous feedback condition. Participants knew the PASS-supervisors prior to this study. The PASS leaders then carried out three sessions for which they received either synchronous or asynchronous feedback. For the synchronous feedback, the PASS-supervisor used the precise keywords on the SOFT; for the asynchronous feedback, the PASS-supervisor used the SOFT but was free to use a more narrative feedback form. Participants then switched for the next three sessions from synchronous to asynchronous feedback or vice versa, but remained with the same PASS-supervisor. Immediately after each of the sessions, we sent the participants a link through Qualtrics to three questions with a seven-point Likert scale (ranging from one, "I completely disagree", to seven, "I fully agree") regarding their feedback experiences relative to that lesson ("I feel confident when teaching PASS," "The feedback I received on today's lesson was useful," "The feedback I received on today's lesson made me feel insecure"). A seven-point rating scale was used since prior research (e.g., Diefenbach and O'Reilly 1993) suggests that these scales generally outperform others on accuracy, perceived ease of use, and agreement of ranks. We designed the questionnaire to measure the daily experiences of PASS leaders in order to compare these results with the focus group interviews. Our focus was on the perceived feasibility of the feedback received, the PASS leaders' feelings of confidence (which forms a part of self-efficacy), and to help us understand whether one form of feedback was perceived as increasing nerves (insecurity) or less useful. We purposely used the words teach and lesson instead of the more PASS-appropriate terms, facilitate and session, as these words are more commonplace for our preservice teachers and not associated with "didactic teaching" but more with the pedagogical approach of helping students learn common to the Dutch context.

All observations took place once a week during the regular weekly PASS sessions at the university between March and June in one academic semester. Nina (pseudonym) discontinued her participation halfway through the study because of family circumstances, though did experience both types of feedback; she did not participate in the focus group. Michael (pseudonym) discontinued his participation due to timing issues with examinations at the end of the academic year and did not participate in the focus group.

Table 2. Division of feedback round 1 and round 2

PASS-leader pseudonym	Round 1	Round 2
David	3 x synchronous	2 x asynchronous
Nina	2 x asynchronous	1 x synchronous
Mary	3 x synchronous	2 x asynchronous
Michael	2 x synchronous	

Robert	3 x asynchronous	3 x synchronous
Anthony	3 x asynchronous	1 x synchronous

The PASS-supervisors, Hamish and Ismael (pseudonyms) were not located in the same classroom as the PASS-leaders and used the webcam to observe the PASS sessions. Data collection occurred once a week for each PASS-leader, with exceptions for absences, schedule changes, or other unanticipated disruptions. We recorded all sessions and stored them in a safe cloud-based environment accessible only to the authors.

Following the completion of two rounds of feedback (synchronous and asynchronous), we invited all participants to join a focus group in order to ascertain the feasibility of implementing synchronous performance feedback into the supervision of PASS-leaders. The first author, not a PASS-supervisor, conducted two PASS-leader focus group meetings and one PASS-supervisor focus group meeting. The organisation of the focus groups was pragmatic due to participant availability in a period full of examinations, lessons, and practicum at the end of the academic year. We chose homogeneous focus groups, i.e., we separated the PASS-leaders and PASS-supervisors and carried out focus groups in the familiar setting of the university in order to encourage participants to share more readily (Nyumba et al. 2018). The focus group questions were designed to be open and exploratory in order to avoid leading answers and were based on literature in the areas of teacher self-efficacy (e.g., Zee et al. 2016), and synchronous and asynchronous performance feedback practice (e.g., Gander and Dann 2022; Kehrwald, Stahl, and Sharplin 2018; Scheeler, McKinnon, and Stout 2012). The PASS-leader groups' focus was on gathering information about their experiences and preferences regarding synchronous and asynchronous performance feedback and to encourage spontaneous conversation. The focus with the PASS-supervisors was on gathering information regarding their observations of PASS-leader performance during the sessions with synchronous feedback and their personal experiences with synchronous and asynchronous feedback. The following are typical prompts used by the interviewer to promote discussion:

- Can you tell us about your experiences with synchronous (bug-in-ear) feedback?
- Did synchronous feedback cause you additional stress whilst supervising the session?
- Did asynchronous feedback cause you stress?

Our primary dependent variable was participant experiences with synchronous and asynchronous performance feedback using the SOFT taxonomy (see Appendix 1). Our participants, as preservice teachers, were already accustomed to receiving performance feedback after the lesson, but we were interested in learning about their experiences when restricting the feedback to visible behaviour using the SOFT, rather than subject-specific feedback, and adding in the synchronous aspect. Data collection for this measure comprised focus group interviews. Our second dependent variable was confidence in instructional and pedagogical skills, recorded using a questionnaire and part of the focus group interview. Since teaching confidence is part of teaching self-efficacy, we wanted to learn if participants perceived one, both, or neither form of performance feedback as helping their feelings of confidence in their teaching ability.

Data analysis: Participant perceptions

To answer our research questions, we carried out multiple rounds of iterative analyses of the verbatim focus group transcripts for both the PASS-leaders and PASS-supervisors using MaxQDA

(Creswell 2012). We selected coding choices that were concept-driven and informed by our research questions. In the first round we segmented the transcripts on the basis of explicit positive and negative evaluations with words such as "enjoyed" (positive), "it took adjustment" (negative), and "it was okay" (neutral). In a second round we merged the columns thematically. This resulted in eight main themes: positive aspects of synchronous feedback, negative aspects of synchronous feedback, neutral aspects of synchronous feedback, positive aspects of asynchronous feedback, negative aspects of asynchronous feedback, neutral aspects of asynchronous feedback, confidence in teaching, and advice regarding performance feedback in general. Afterwards we aggregated comments in order to ascertain a general summary of the above points. This was followed by a debriefing with the co-authors in order to check for consistency and ensure agreement regarding themes, coding, and coded segments (Creswell 2012; Kuckartz and Rädiker 2019).

To analyse participant responses to our post lesson surveys, we fitted longitudinal linear models, using the lme4 package (Bates et al. 2015) in R (R Core Team 2021). The dataset and statistical code are openly accessible (Taylor and Dekker 2025).

RESULTS

PASS-leader and PASS-supervisor experiences and preferences

During the focus group sessions both PASS-leaders and PASS-supervisors agreed that synchronous feedback enabled the immediate interaction with and reaction to the performance feedback and thus provided direct assistance and support. PASS-leaders likened synchronous feedback with the SOFT to an instructional team, as opposed to asynchronous feedback, which they compared to being judged after your session. "I feel that with asynchronous feedback you are not working together with your observer; there's no teamwork, which I feel there is with synchronous feedback." (David)

David had previously heard he had a habit of speaking too fast and indicated "if I'd heard that on the spot then I could have done something about it and thus help my students understand better." He was adamant that he preferred synchronous feedback, but that asynchronous feedback would be better for more subject specific content. Anthony and Mary both indicated SPF helped them with lesson timing. Mary reflected, "after the first synchronous session I already thought I should have had this six months ago, as it would have helped me with a really tough group I have" (here she is referring to her practicum group for her study as a teacher trainee).

The PASS-supervisors appreciated being able to help the PASS-leaders rather than ". . . sit on your hands and just write things down with a timestamp and try to describe the situation after the lesson in the hope you and the PASS-leader can both remember what happened" (Hamish). Ismael also concurred that synchronous feedback can be useful for aspects which are harder to retrieve after the session.

Anthony and Mary indicated they would like to receive synchronous feedback during their practicum placements for their teacher education course. Mary indicated that she preferred synchronous to asynchronous feedback where she felt observed, since she simply forgot the webcam was there.

The main disadvantage of SPF was that the method is not suitable for providing feedback on session design or content, which would make the combination of synchronous feedback and asynchronous feedback ideal. Robert indicated he needed the first session to acclimatise to SPF but by the second session he found it fine. Anthony also indicated that his students could see his reaction to synchronous feedback in his first session, but it did not increase his stress levels and was no longer visible in subsequent sessions.

Hamish indicated he enjoyed working with a taxonomy to help guide his feedback but that sometimes he wanted to give subject-specific feedback synchronously rather than wait until after the session. Also, he found himself adding to the taxonomy, "I found the message didn't stimulate self-regulation enough, so rather than just 'good job', I added something like 'good that you gave process feedback'." Ismael also indicated that the taxonomy directed his SPF focus, but he still felt the need to take notes for more subject-specific feedback post hoc. Ismael also reflected that providing feedback within three seconds was quite difficult, as he did not always feel he had enough time to formulate his thoughts before the moment passed. Ismael did not have much experience but would prefer, in his role as PASS-supervisor to have a combination of synchronous feedback in combination with a short asynchronous moment, whereas Hamish indicated he preferred to provide purely synchronous feedback for the future of PASS sessions and to gradually remove the support as PASS-leaders become more proficient.

Specific other comments expressed by PASS-leaders and PASS-supervisors regarding synchronous and asynchronous feedback are presented in Table 3. Nina and Michael did not participate in the focus group sessions so their responses to the synchronous and asynchronous feedback were only recorded through the post lesson surveys.

Table 3. Focus group results

	Synchronous feedback with SOFT	**Asynchronous feedback with SOFT**
Positive according to PASS-supervisors	● PASS-leader could make small instant adjustments ● Useful for problem-solving e.g., classroom management ● Gives PASS-supervisor peace of mind regarding progress	● More structured than synchronous feedback ● Can be used for feed-forward ● Can give subject-specific focus
Challenge according to PASS-supervisor	● Not subject-specific feedback ● Camera placement can be a hindrance to sufficient visibility	● For a good lesson, feedback is often non-specific ● "Can give you stress from not taking enough notes"
Positive according to PASS-leader	● Likened to a personal helper on your shoulder ● Feels like teamwork ● "It might be very useful in problematic classes" ● Gives specific pedagogical help ● No physical presence taking notes which gives stress	● Familiar / routine ● "PASS-supervisor can provide feedforward and explanations for the feedback" ● Can be subject-specific
Challenge according to PASS-leader	● Privacy "I worry that everything can be heard because of microphone" ● Can disrupt concentration ● "It's fleeting – if you miss the opportunity, you might not remember later" ● Technological stress	● Not "teamwork" but an expert telling you what to do better

Ideal feedback according to participants ● Pre-brief is helpful to understand the type of classroom climate ● Immediate feedback needed more often in problematic classes ● More delayed feedback at the start of the programme, then gradually more immediate feedback for the fine-tuning ● Gradual phasing out for strong PASS-leaders and increase for those who need more help

Note: speech marks are used to provide an example quote from an individual participant. Examples without speech marks are aggregated comments made by two or more participants.

Impact on PASS-leader confidence

Results from the surveys after each session indicated that PASS-leaders felt significantly more confident about teaching after synchronous feedback compared to asynchronous feedback ($t = 2.981$, $p = 0.007$). No significant differences emerged in experienced usefulness of asynchronous feedback ($t = -0.663$, $p = 0.515$) or the degree to which the PASS-leaders felt more insecure ($t = -0.096$, $p = 0.924$). The experienced higher confidence corroborates what PASS-leaders qualitatively said about the support they felt during the session from their PASS-supervisor. The similarity in usefulness could potentially be explained by the trade-off between receiving more useful feedback during the session but less useful feedback on the session design with synchronous feedback. After both types of feedback, insecurity levels were very low: the average score was 1.33 ($SD = 0.17$) on a seven-point scale.

DISCUSSION

PASS-leader feedback and feed forward

Over the past 50 years, PASS has been a relatively stable and effective practice across different contexts (Dawson et al. 2014). The current study piloted an innovative method that may improve the pedagogical on-the-job training of PASS-leaders without undermining the working mechanisms of PASS. A recent review of near-peer teaching in higher education by Dekker et al. (2023a) found that training and supervision of peer leaders are important conditions for success. Their review underscored that we have insufficient insight into the optimal ways to prepare and support near-peer leaders for their role, because different types of preparation or supervision are not usually compared. As far as can be ascertained from existent reviews, this was the first study to compare different types of supervision for PASS- leaders (Dawson et al. 2014; Dekker et al. 2023a).

PASS-leaders have the opportunity to practise specific pedagogies and implement feedback, and thus also work on their feedback literacy. These experiences can build confidence if they are supported and structured, for example through feedback and feed forward. Our participants, preservice teachers, may subsequently use these experiences in the context of their school settings (Wilcoxen and Lemke 2021). As preservice teachers and PASS-leaders, they are expected to recognise when adjustments are needed and change track in order to maximise their students' and peers' learning.

The literature shows, nonetheless, that many peers find it hard to learn and apply the pedagogical skills required for supporting active learning instead of directly providing answers or lecturing students (Wheeler, Maeng, and Whitworth 2015; 2016). These complex skills, such as knowing when to wait and knowing when to intervene without taking over, are mostly learned on the job. The feedback that supervisors provide post hoc after observing does not create the opportunity for PASS-leaders to apply new insights instantly. This study did not specifically look at improvements in participant skills, but rather their own experiences with synchronous and asynchronous

performance feedback; this makes it a matter of speculation as to whether the suggested action would indeed have improved the session. Our results demonstrate that synchronous and asynchronous performance feedback could be feasible in the context of PASS learning. Our participants were positive about the introduction of the new form of feedback, i.e., synchronous feedback, but were reluctant to have it replace the more traditional asynchronous feedback. In the post session questionnaires, we found that the PASS-leaders were significantly more confident about teaching after asynchronous feedback compared to after synchronous feedback. They reported no significant differences in experienced usefulness or insecurity.

Social-affective dimension

Feedback is a social practice involving the management of relationships which can influence learner emotions (Yang and Carless 2012). Feedback, both oral and written, can arouse both positive and negative reactions, encouraging self-regulation or causing a loss of confidence when recipients perceive an unequal power relationship with whomever is observing them. Indeed, our participants indicated that synchronous feedback could change the power-dynamic and relationship between the PASS-leader and supervisor: from being judged by a silently attending supervisor, to becoming a teaching team. This suggests that participants saw synchronous feedback as a more dialogic approach than asynchronous feedback, where PASS-leaders felt their role was more akin to being assessed.

Future directions

Modern technology has the potential to aid with the provision of timely feedback and, therefore, a more rapid increase in desired teaching and learning behaviours. Some have questioned whether synchronous feedback interferes with the learning environment (see e.g., Wilcoxon and Lemke 2021). This correlates with some of our results whereby a participant said they needed a moment to adjust, and another said they doubted they would consider synchronous feedback in a challenging classroom. The findings from the focus group suggest, however, that synchronous performance feedback could be feasible for higher education and can best be used in combination with a pre-brief with feedback on the methodological design and content knowledge and a debrief where the supervisor can provide feedback on any additional matters or make space for further clarification or questions from the dialogic partners. This may also help relieve some of the issues related to the massification of higher education, since the PASS-supervisor does not need to be in the same location as the PASS-leader and could conceivably render the observations more efficient. These pre-briefs and debriefs are currently also being offered in some PASS contexts (e.g., Dekker, Luberti, and Stam 2023b).

Limitations

In this pilot, we qualitatively and quantitatively studied a small sample with thorough experience with both types of feedback in order to assess the feasibility of a novel approach to performance feedback. For a feasibility study, this is a suitable approach, but for effectiveness tests, larger samples are required to increase the statistical power. Future studies could experimentally test the impact of the different methods with a larger sample and test the impact on satisfaction and performance quality in order to further extend our knowledge about the effectiveness of this feedback type. Another limitation of this study is that we worked with PASS leaders who volunteered to participate. There were several PASS leaders who chose not to participate. Reasons that withheld

leaders from using synchronous feedback could potentially also complicate scaling this method. It is also important to note that our participants were all preservice teachers who needed little explanation of the SOFT and already had considerable experience of preparing lessons and standing in front of groups due to their practicum experiences. It would be worthwhile to extend this study to include PASS-leaders from other domains who have less experience with receiving performance feedback.

CONCLUSION

By piloting a form of synchronous feedback, this feasibility study made three contributions to the literature on PASS and near-peer learning. First, we found that synchronous feedback is feasible, that it helps PASS-supervisors to directly support the PASS-leaders with their instructional and pedagogical skills, and that this boosts PASS-leaders confidence about teaching.

This study suggests that a combination of affordable accessible technology and a taxonomy with a focus on accepted performance standards can be used to ensure viable synchronous feedback for PASS-leaders. Both PASS-leaders and PASS-supervisors felt positive about the implementation of a combination of synchronous and asynchronous performance feedback for learning during the PASS sessions. This method offered PASS-leaders valued support that helped them fine-tune facilitation and pedagogical skills, such as waiting for attention, and allowed them to directly use the feedback instead of experiencing this as a post-hoc judgment. Our results could inform further research into the development and implementation of performance feedback curricula in universities that look for ways to improve the quality of peer learning.

AUTHOR BIOGRAPHIES

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ETHICS

Research was approved through the University of Amsterdam ethical review processes.

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APPENDIX

Welcome & ground rules

Welcome – there is no wrong answer, it's about giving your opinion even if it is not the same as your peers. We will be recording the conversation so that we don't miss anything. "Nathan" is also here to ensure that I don't miss anything important, to take notes, and to keep an eye on the time. Everything is confidential and will have no further impact on your study. The name stickers are purely so that we can address each other by name, but these names will be removed in the transcript and notes.

The conversation will go as follows. I will ask a question, which you will also see on the PowerPoint slide. You can then respond and react to each other's response. Feel free, therefore, to react to each other – I am only here to occasionally interject if clarification is needed, but mainly just to listen. If someone is taking over the conversation or somebody is barely contributing, then I may cut in to allow others the chance to express their experiences.

Please put your telephone in aeroplane mode or at least on silent – but if you really do have to answer a call then please do so outside.

We are going to discuss your experiences with performance feedback, synchronous (with a Bluetooth earpiece), and asynchronous (after the lesson).

Let's begin.

For the PASS-leaders the questions were as follows:

The main questions are numbered, sub questions are lettered, prompts have roman numerals

1. Could you tell us about your experiences with synchronous (bug-in-ear) feedback?
    a. Could you describe what was going on in your head when you heard synchronous feedback? (inner feedback – inner dialogue)
        i. Do I want to react?
        ii. How should I react?
    b. Do you feel the synchronous feedback helped you during the lessons?
        i. How?
    c. Did the synchronous feedback give you stress during the lesson? (cognitive load)
        i. Could you indicate why you think that?
2. Could you tell us about your experiences with asynchronous feedback?
    a. Do you feel that the asynchronous feedback had an impact on the way you taught your lessons?
    b. Do you have the feeling that asynchronous feedback had an impact on your stress level?
        i. Could you indicate why you think that?
3. Could you tell us about your feelings of confidence in teaching now that you are finished with these feedback sessions?
    a. Do you feel more, less, or equally confident in your teaching ability than before you started with these feedback sessions?
    b. Do you think that synchronous feedback gave you more, less, or an equal amount of confidence in teaching than asynchronous feedback?
        i. Could you explain why you feel that?
4. Could you tell us about your preferences with regards to synchronous and asynchronous feedback?

   a. What form of feedback do you prefer: synchronous during the lesson, asynchronous after the lesson, or a mix of both?
      i. In the first case (synchronous or asynchronous): can you explain why?
      ii. In case of a mix: can you explain how you would like to see that, e.g. at which moment in your study or PASS-supervision or for which specific skills?
   b. Do you feel that you could link one of these forms of feedback to a specific phase in your education?
5. What is the most important thing you have told us today that we must absolutely take account of?

For the PASS-supervisors, the questions were as follows:

The main questions are numbered, sub questions are lettered, prompts have roman numerals

1. Could you tell us about your experiences with synchronous (bug-in-ear) and asynchronous feedback?
   a. Do you feel you had a different focus with synchronous than with asynchronous feedback?
      i. If yes: could you explain what and why? (cognitive load, amount, technology, timing, PASS-leader nerves, and experience)
   b. Do you feel that one or other of these feedback forms increases your stress levels? (cognitive load, adjustment, technology)
2. Could you tell us about your preferences with regards to synchronous and asynchronous feedback?
   a. What form of feedback do you prefer: synchronous during the lesson, asynchronous after the lesson, or a mix of both?
      i. In the first case (synchronous or asynchronous): can you explain why?
      ii. In case of a mix: can you explain how you would like to see that e.g. at which moment in the study or PASS-supervision or for which specific skills?
   b. Do you feel that you could link one of these forms of feedback to a specific phase in the education at your faculty?
3. Could you describe the impact of your feedback on the PASS-leader's teaching behaviour?
   a. Which form do you think had the biggest impact on the PASS-leader's skills (self-regulation)
4. What is the most important thing you have told us today that we must absolutely take account of?

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