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Article:

Hargreaves, Jessica, Ketnor, Claire, Marshall, Ellen et al. (Cover date: Received 02 Jun 2021, Published online: 09 Feb 2022) Peer-Assisted Learning in a pandemic.

INTERNATIONAL JOURNAL OF MATHEMATICAL EDUCATION IN SCIENCE AND TECHNOLOGY.

<https://doi.org/10.1080/0020739X.2021.2008036>

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To cite this article: Jessica Hargreaves, Claire Ketnor, Ellen Marshall & Sue Russell (2022): Peer-Assisted Learning in a pandemic, International Journal of Mathematical Education in Science and Technology, DOI: [10.1080/0020739X.2021.2008036](https://doi.org/10.1080/0020739X.2021.2008036)

To link to this article: <https://doi.org/10.1080/0020739X.2021.2008036>



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Published online: 09 Feb 2022.



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Peer-Assisted Learning in a pandemic

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ABSTRACT

Peer-Assisted Learning (PAL) schemes typically involve student volunteers (PAL Leaders) designing and delivering sessions that support groups of students in lower years with their studies. This paper discusses three different PAL schemes, within Mathematics degrees at Sheffield Hallam University (a Post-92 University) and The University of York (a Russell Group University), which took place entirely remotely during the Covid-19 pandemic. In this paper, we explore the challenges and benefits of remote PAL schemes via the three case studies, from both staff and student perspectives. There are aspects of PAL in a pandemic that we would (or would not) take forward to a blended or in-person approach in the future. In particular, we found that, while students and staff alike are looking forward to in-person contact to provide them with interactions and easier methods of communication, the remote provision for peer support has real value in terms of accessibility and inclusivity. Furthermore, integrating technology enhanced learning into in-person sessions can provide added value.

ARTICLE HISTORY

Received 2 June 2021



KEYWORDS

Peer-Assisted Learning; community; peer support; online delivery

1. Introduction

Peer-Assisted Learning (PAL) schemes in the UK are typically based on the SI-PASS (Supplemental Instruction Peer-Assisted Study Sessions) model, with trained PAL Leaders working collaboratively with staff to provide students with a peer learning environment (see, Arendale, 1994, for example). There is variation between schemes, but some of the core principles of PAL are that it is designed to be run by students, for students and that it involves working with ‘students as partners’ (Sedghi & Lunt, 2015). The PAL sessions are usually run by trained students, in later years of study, for first-year students. Research in the UK (Dawson et al., 2014; Keenan, 2014) shows that PAL schemes not only enhance transition into university, but can also improve student progression, achievement and satisfaction.

During the 2020–2021 academic year, UK COVID-19 restrictions required many aspects of university courses to be offered remotely (Nerantzi, 2020). This transition resulted in many educators adapting their traditional classroom-based teaching

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approaches and materials to the online space (Crawford et al., 2020). On-campus PAL sessions are typically characterized by participation in interactive and collaborative activities (Sampaio et al., 2011). Therefore, for PAL coordinators, the goal was to devise alternative remote PAL provision to provide their learners with an equivalent PAL experience.

Within this classroom note, we present details of three different PAL schemes that take place within Mathematics degrees and were all run remotely during the 2020–2021 academic year. This article is organized as follows. In Section 2, we introduce the three case studies of PAL schemes, highlighting their similarities and differences. In Section 3, we explore the challenges and benefits of remote PAL schemes via these case studies, from both staff and student perspectives. Section 4 concludes by outlining the ‘takeaways’ from delivering PAL in a pandemic, which are the approaches and principles that will be of use in future post-pandemic practice.

2. PAL case studies

This section starts with an overview of the three PAL schemes, including their similarities and differences, before outlining the details of remote delivery in Section 2.2.

2.1. Overview

The PAL scheme in Case Study 1 was integrated into the Mathematics course at Sheffield Hallam University (the Post-92 University) in 2008–2009 with the main aims of easing the transition into university and fostering a learning community (Waldock, 2011). Students in the first semester of their degree undertake a summative assessment task in groups, whilst being supported by PAL Leaders during timetabled sessions. These ‘PAL projects’ draw on skills developed across the course but are run independently from other modules.

Unlike the PAL scheme in Case Study 1, an alternative approach to peer-assisted learning is to follow the ‘supplemental instruction’ model and embed the PAL sessions within the teaching provision of a specific ‘historically difficult’ module (Arendale, 1994). In this context, ‘difficult’ implies that students find it a challenge to understand the material covered during lectures and identify that they require additional support beyond lectures and seminars. Statistics is a subject that students often have a negative perception of, or feel anxious about, which impacts on their ability to learn (Cornock et al., 2019; Marshall, 2019). Therefore, in 2019–2020, peer support was introduced for the first year ‘Probability and Statistics’ module at Sheffield Hallam University (Case Study 2). Interestingly, when mathematics students from the University of York (Case Study 3) were consulted on which module they felt would benefit most from PAL provision in 2020–2021, they identified the equivalent ‘Probability and Statistics’ module in their degree.

The PAL sessions in Case Study 2 operate mainly as ‘drop-in’ sessions, directed by the needs of those that attend, giving students the opportunity to: get support with understanding the content of the module (including developing skills such as SAS programming and report writing) and (from 2020 to 2021) seek guidance on the coursework. However, the PAL sessions in Case Studies 1 and 3 include activities that are planned by PAL Leaders in advance. For example, PAL Sessions in Case Study 3 have the following structure:

(1) **Drop In- ‘ask us anything’:**

This was intended to ease the transition and help students settle into university life (Byl et al., 2015).

(2) **‘Legal Hints’- tips for the weekly assessment (approved by lecturer):**

Providing this information was mainly to improve attendance, so students see a tangible benefit to attending (Sloan et al., 2020).

(3) **Interactive pre-planned activity**

PAL Leaders facilitate activities to encourage discussion amongst the group, to develop comprehension of previously taught module content (Sampaio et al., 2011).

In all three case studies, PAL Leaders have (generic) SI-PASS equivalent training from qualified instructors plus additional subject-specific training from staff in the course teams. The training includes exploration of scenarios that could be encountered (e.g. if PAL Leaders do not know the answer or challenging group dynamics). PAL Leaders are also provided with techniques and tools to encourage engagement as they facilitate PAL sessions. PAL Leaders for the statistics PAL schemes (Case Studies 2 and 3) had a specific session which was adapted from Sigma training for mathematics and statistics support tutors (Owen et al., 2015). Furthermore, in all three Case Studies, the PAL Leader training sessions adopt the techniques that the PAL Leaders will utilize in the sessions- for demonstration purposes (see Section 2.2.2).

All three schemes were designed so that there was no direct staff presence at the PAL sessions. However, staff provide background support for the PAL Leaders- including: the initial training; support sessions and regular communication on how the sessions are going. In Case Study 3, PAL Leaders and staff attended a weekly ‘de-brief’ session. The de-brief session gave the PAL Leaders the opportunity to feedback and reflect on the previous sessions and then work collaboratively with staff to plan the next session. The collaborative nature of this session emphasized the central ethos of PAL, which is the principle of working with the students as partners throughout the scheme (Sedghi & Lunt, 2015).

A summary of the three schemes is contained in Table 1.

2.2. Remote delivery of the PAL schemes

In this section, we present details of the remote delivery of the schemes during 2020–2021. Pre-pandemic, the PAL schemes at Sheffield Hallam University were already successful at enhancing feelings of belonging and helping students transition into university (Cornock, 2016). Staff for all three schemes were keen to replicate this experience as much as possible in the remote environment.

2.2.1. Remote set-up

All three PAL schemes took place on Zoom. In traditional PAL sessions, staff tend not to be present. However, when delivered remotely, staff at Sheffield Hallam University remained in the Zoom room in some capacity, initially more as a ‘receptionist’ but also to provide assistance and support. For Case Studies 1 and 2, groups used the breakout rooms (either for meetings or for drop-in support). In Case Study 1, the PAL Leaders stayed with their groups and the PAL Supervisors moved between groups and the main Zoom room. In Case Study 2, first-year students could use the breakout rooms to get drop-in support or

Table 1. A summary of the similarities and differences between the three PAL schemes.

Institution	Case study 1 (Sheffield Hallam University)	Case study 2 (Sheffield Hallam University)	Case study 3 (University of York)
First established	2008–2009	2019–2020	2020–2021
Embedded within a module	Contributes to a Mathematics module mark, but run independently	First (and later second) year ‘Probability and Statistics’	First year ‘Probability and Statistics’
Session type	PAL Leaders assigned to specific project groups and plan support sessions.	Group or individual ‘drop-in’ support	Structured sessions (planned with staff)
PAL supervisors (students who support PAL leaders)	Yes	Yes	No
Staff involvement	Support in the background	Support in the background	Planning and debrief

Table 2. Google Doc activity in the training for PAL Leaders and supervisors (Case Study 1).

Topic	Who	Findings (including links to websites)
Wait time	PAL leaders	
Peer interaction	PAL leaders	
Starting a meeting	PAL leaders	
Closing a meeting	PAL leaders	
Peer observation	PAL supervisors	

could work on their group assessment task. Support would be on hand from any of the PAL Leaders. Case Study 3 did not have a staff presence at the PAL sessions.

2.2.2. Remote training and PAL Leader tools

As all PAL sessions would be delivered remotely during 2020–2021, the training sessions replicated this modality. This gave PAL Leaders vital experience in hosting remote sessions, whilst simultaneously giving them the experience of participating in them.

Note, in contrast to Case Studies 1 and 2, the PAL scheme in Case Study 3 was first introduced during the pandemic and therefore was designed to run remotely from inception. Therefore, the interactive pre-planned activities within the PAL sessions (see Section 2.1) would be delivered remotely and hence utilize online tools such as Jamboard, Padlet, Kahoot and Zoom features (e.g. chat function, emoji reactions, polls, break-out rooms, etc.). Therefore, the PAL Leader training also utilized and introduced these tools.

However, most of the methods provided in the traditional training for (the established) Case Studies 1 and 2 involved physical activities to encourage active learning (e.g. the use of post-it notes and individual whiteboards). Therefore, in 2020–2021, alternative methods were provided to the PAL Leaders to encourage engagement within the sessions. These included: online electronic games as ice-breakers, instead of the physical ‘Maths Arcade’ (Cornock, 2015); virtual post-it notes; the use of the virtual whiteboard (with ticks and crosses on the boards for voting), the Zoom private chat function and Socrative (2021), instead of using individual whiteboards; and Google Docs, for collecting information in groups. An example of a table which formed an exercise in the PAL training from Case Study 1 is presented in Table 2. The students had to find information and resources and fill in their part of the table within Google Docs within 10 minutes.

3. Reflections on the remote delivery of PAL

In this section, we reflect on the range of experiences delivering PAL remotely in a pandemic from both staff and student (attendees, PAL Leaders/ Supervisors) perspectives.

3.1. Methods

In order to understand the student perspective, authors at Sheffield Hallam University interviewed PAL Supervisors from both schemes who had delivered peer support face to face in 2019–2020 and remotely in 2020–2021. At the University of York, PAL Leaders and

potential attendees (i.e. students enrolled on the module) were invited to give feedback on the scheme through a short questionnaire (which had 15 respondents).

3.2. Overall PAL experience

Although, overall, delivering PAL remotely was more challenging, and both PAL supervisors at (Sheffield Hallam Univeristy) concluded that the scheme was better in person, the key aims (see Section 1) of PAL were achieved. They thought that running the PAL schemes remotely did still help form a community and that it would have been particularly difficult for students to have made friendships with other people on the course in 2020–2021 without it. This aspect was also identified by the students at the University of York with one student commenting ‘I got to meet a lot of new people in the mathematics department, very valuable especially this year’.

All those surveyed at the University of York felt that they had benefitted from being part of the PAL scheme. For example, all (15) students surveyed (including PAL Leaders) felt being involved with PAL had improved their subject knowledge.

3.3. Challenges and benefits of remote delivery

The main benefits of remote peer support centred on the convenience and accessibility of remote sessions compared to on campus. For staff, not needing to book a physical space for the session or restrict group sizes and not requiring anyone to come onto campus especially for a session. Students also commented on this aspect (‘You don’t feel like you’re wasting anybody [sic] time - it’s easier and more convenient... but when it’s in person it makes it less convenient and makes you wonder if it’s worth it going all that way for just a small question’), as well as feeling more anonymous ‘[Online] can be a little less nerve wracking because you are on the other side of the screen, you can be anonymous’.

Attendance for Case Study 1 remained consistent with previous years but for Case Study 2, attendance increased. This could partly be due to the convenience of online sessions but the introduction of direct support with group work (in line with Case Study 1) is also likely to have impacted on engagement. One of the main challenges to delivering peer support remotely was using and managing the virtual space. In a traditional on-campus peer support session, PAL Leaders would be aware of new students entering the room, or which students are requiring help, and move easily from table to table without disruption, whereas this was harder online.

PAL Supervisors also commented on the negative impact of remote delivery on communication, between the students themselves and with PAL Leaders (‘The general conversation seemed different as there was often minimal response and seemed like a chore to get some people communicating.’; ‘I think some people generally have more anxiety when joining Zoom rooms and speaking, it always seemed like the routine was to join and sit in silence until spoken to’). They found it more challenging to get students to participate as it is easier to avoid joining in remotely, and this may have ‘limited the friendships that could have been made’. They acknowledged that this became easier after the initial reluctance. They emphasized the importance of the scheme in helping students form support groups and having a relaxed atmosphere to enable this to happen, which can be done more easily in-person.

Survey results from the University of York suggested a strong preference for having both online and in-person options available (73%) with both individual options also receiving support (online only (7%) and in-person only (20%)). These findings suggest that students would like to retain a remote option in future.

4. Take-aways

Following reflection, we are able to report a number of take-away messages. In Section 4.1, we outline generic tips for delivering PAL schemes. In Section 4.2, we outline how the experience of delivering remote PAL schemes informs future practice.

4.1. Generic tips for PAL schemes

As our three examples illustrate, there is no single way to run a PAL scheme. However, we have some general considerations.

Carefully linking a PAL scheme to assessment, such as providing targeted support for coursework, seems to improve attendance.

The amount and type of staff involvement needs to be considered. We would recommend keeping direct staff involvement at PAL sessions to a minimum, whilst still maintaining high levels of support for students running the scheme.

Activity-based training is not only an effective way to convey information, but also provides PAL Leaders with techniques and tools that they can adapt for their own PAL sessions, to encourage engagement. Having a variety of techniques gives PAL Leaders a number of approaches they can use to involve all students.

4.2. Remote PAL schemes informing future practice

To summarize, these case studies have illustrated that the main benefits of remote PAL sessions are the flexibility (Vlachopoulos & Jan, 2020) and option for anonymity afforded by this delivery method. However, although staff and student feedback indicated that the remote PAL sessions had, despite the challenging circumstances, developed a sense of community and enabled interactive activities, most participants felt that, for these aspects, the in-person experience is preferred. Therefore, Case Studies 1 and 3 (where the sessions include pre-planned interactive activities) plan to provide face-to-face PAL Sessions in future (when possible).

However, the intrinsic structure of a 'Drop-in' or 'Question and Answer' session facilitates the transition to a remote setting, as most aspects of the in-person experience are retained, with the additional benefits outlined previously. Therefore, in two of the case studies (those embedded within modules), we have identified that some remote provision will be retained in future. In particular, in Case Study 2, 'virtual group work rooms' (for groups to meet with support on hand at specific times) will be retained. In Case Study 3, there will also be a dedicated Online PAL Drop In Session. This provision will ensure that the PAL schemes are more flexible for students, preserve anonymity (if required) and, hence, are more inclusive. Furthermore, the dual option of in-person and remote delivery will hopefully mean that more students engage with the sessions (than if there is only one option).

Furthermore, the experience of teaching and learning remotely has exposed both staff and students to a range of online tools that can also be utilized in traditional settings. Using anonymous methods of communication in in-person sessions can be beneficial, as an efficient method to gauge understanding and to encourage participation. Therefore, all three schemes will embed technology enhanced learning in future.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

- Arendale, D. (1994). Understanding the supplemental instruction model. In D. C. Martin & D. Arendale (Eds.), *Supplemental instruction: Improving first-year student success in highrisk courses* (2nd ed., pp. 3–10). National Resource Center for the Freshman Year Experience and Students in Transition.
- Byl, E., Struyven, K., Meurs, P., Abelshausen, B., Lombaerts, K., Engels, N., & Vanwing, T. (2015). The potential of peer assisted learning as a tool for facilitating social and academic integration. *Journal of Learning Development in Higher Education*, (Special edition: Academic Peer Learning), November, 1–28. <https://doi.org/10.47408/jldhe.v0i0.343>
- Cornock, C. (2015). Maths Arcade at Sheffield Hallam University: Developments made in a new space, *MSOR Connections*, 14 (1). <https://doi.org/10.29311/ndtps.v0i14.3270>
- Cornock, C. (2016). The evaluation of an undergraduate Peer Assisted Learning Scheme at Sheffield Hallam University, *Journal of Learning Development in Higher Education (Special Edition - Academic Peer Learning, Part II)*.
- Cornock, C., Marshall, E., & Hargreaves, J. (2019). Work-related learning: Benefits and challenges. *New Directions in the Teaching of Physical Sciences*, 14(1). <https://doi.org/10.29311/ndtps.v0i14.3270>
- Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., Magni, P.A., & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, 3(1), 9–28. <https://doi.org/10.37074/jalt.2020.3.1.7>
- Dawson, P., van der Meer, J., Skalicky, J., & Cowley, K. (2014). On the effectiveness of supplemental instruction: A systematic review of supplemental instruction and peer-assisted study sessions literature between 2001 and 2010. *Review of Educational Research*, 84(4), 609–639. <https://doi.org/10.3102/0034654314540007>
- Keenan, C. (2014). *Mapping student-led peer learning in the UK*. Higher Education Academy. Retrieved May 28, 2021, from https://www.heacademy.ac.uk/system/files/resources/Peer_led_learning_Keenan_Nov_14-final.pdf.
- Marshall, E. (2019). Embedding and assessing project based statistics. *MSOR Connections*, 17(2), 75–82. <https://doi.org/10.21100/msor.v17i2.979>
- Nerantzi, C. (2020). The use of peer instruction and flipped learning to support flexible blended learning during and after the development and implementation of a Peer Assisted Learning programme at the COVID-19 pandemic. *International Journal of Management and Applied Research*, 7(2), 184–195. <https://doi.org/10.18646/2056.72.20-013>
- Owen, A., Marshall, E., & Smith, S. (2015). Scenario based training of statistics support tutors. In *IMA Barriers and Enablers conference proceedings 2015*.

- Sampaio, P. N., Teixeira, J. M., Camacho, M. F., & de Freitas Gouveia, R. H. (2011). Blended peer-assisted learning platform: Improving learning outcomes with a collaborative environment. *Journal of Educational Technology Systems*, 39(4), 371–395. <https://doi.org/10.2190/ET.39.4.c>
- Sedghi, G., & Lunt, T. (2015). The development and implementation of a Peer Assisted Learning programme at the University of Liverpool. *Journal of Learning Development in Higher Education, Special Edition: Academic Peer Learning*, November 2015, 1–17.
- Socrative. (2021). Showbie Inc. Retrieved May 28, 2021 from <https://www.socrative.com/>.
- Sloan, D., Manns, H., Mellor, A., & Jeffries, M. (2020). Factors influencing student non-attendance at formal teaching sessions. *Studies in Higher Education*, 45(11), 2203–2216. <https://doi.org/10.1080/03075079.2019.1599849>
- Vlachopoulos, P., & Jan, S. (2020). Exploring modes of lecturing as a teaching method in Higher Education: Student attendance, preference and motivation. *Journal of University Teaching & Crawford, J. Learning Practice*, 2020(17), 1–18. <https://doi.org/10.53761/1.17.5.15>
- Waldock, J. (2011). Peer assisted learning. In Waldock, J. (ed.) Developing graduate skills in HE mathematics programmes. national HE STEM programme (pp. 22–23) [Online]. Available at: <http://www.mathcentre.ac.uk/resources/uploaded/gradskills.pdf>