Received: 2 July 2021 | Revised: 18 October 2021 | Accepted: 21 October 2021

DOI: 10.1111/medu.14684

RESEARCH ARTICLE

WORKPLACE-BASED LEARNING

Longitudinal placements for trainee pharmacists: Learning whilst improving patient care

Hannah Kinsey[1] | Jeremy Sokhi[1] | Maria Christou[1] | David Wright[2]

[1]School of pharmacy, University of East Anglia, Norwich, UK

[2]School of Allied Health Professions, University of Leicester, LE1 7RH, UK

Correspondence
Hannah Kinsey, CAP 0.17, University of East Anglia, Norwich NR4 7TJ, UK.
Email: h.kinsey@uea.ac.uk

Abstract

Introduction: Longitudinal Integrated Clerkships (LICs) have demonstrated benefits for students' learning and development in medical education globally. The model emphasises importance with respect to continuity and time in the workplace for learners. There is a need to explore how LICs become a viable training model for learners. An amalgamative LIC model was drawn upon to inform the design of a placement for trainee pharmacists on a hospital ward. This study sought to determine the local viability of a longitudinal placement for trainee pharmacists, using communities of practice learning theory to interpret findings.

Methods: A design-based research approach informed study design. A longitudinal placement was implemented on two hospital wards for 13 weeks. Trainees ($n = 3$) were interviewed four times over a 14-week period. Ward staff ($n = 14$) were interviewed at week 14. Interviews were transcribed verbatim. Qualitative longitudinal analysis, using the trajectory approach, was conducted using abductive analysis. The coded data were organised into a framework and subthemes were created.

Results: Trainees acquired membership within the multi-disciplinary ward team over time. This led to an enriched learning experience and the trainee's professional development improved as they attained more responsibilities. This enabled them to make a greater contribution to patient care; more medication consultations occurred, and discharge times improved.

Discussion: The local viability of the longitudinal placement appears to be linked to the trainee's ability to acquire membership within the ward community of practice. Membership gave trainee's access to learning opportunities, supporting their development, and they earnt the trust of staff, leading to more responsibilities for providing patient care. Further research into developing longitudinal placements that support trainee healthcare professionals to acquire membership within communities of practice is warranted.

1 | INTRODUCTION

1.1 | Longitudinal integrated clerkships

Longitudinal Integrated Clerkships (LICs) are gradually being introduced in more medical education programmes globally, as they have demonstrated benefits for students' learning and development.[1–3] LICs are designed to enable students to provide care for patients over time; build relationships with the clinicians looking after these patients and achieve the majority of the year's core clinical competencies for their course, across multiple disciplines through these experiences.[4,5] The model is centred on continuity and time, and students provide care for a complex cohort of patients.[1,6] Benefits for students undertaking an LIC are numerous and include improved professional development,[7] confidence,[8] clinical skills,[9] autonomy,[10] enhanced professionalism,[10] acquisition of responsibilities,[11] feeling 'useful',[12] development of problem-solving skills[12] and building a patient-centred approach to care.[13,14]

The length, format, timing within the curriculum and clinical environment of the LICs vary widely.[2,7,15,16] They can range from 6–54 weeks; consist of a few hours each week, to full-time; take place in primary or secondary care settings; occur across different specialties and happen in different years of an education programme.[1,4,7,16] Hence, it is possible to create a variety of LIC models, the design of which will likely fall into one of three categories: amalgamative, blended or comprehensive.[1] LICs have predominantly been implemented within medical schools in the United States, Canada, Australia and South Africa.[5,15] However, more medical schools within the United Kingdom (UK) have begun introducing them into their curricula.[17]

1.2 | Pharmacist training

The majority of research into LICs to date has taken place in the context of medical education.[1,2,7,15,16] Little is known about their use in the training of other healthcare professionals, such as pharmacists. Pharmacist training in the UK usually comprises a 4-year degree, followed by 1 year of foundation training (formerly called pre-registration training). During the foundation year, trainee pharmacists are supported by a Pharmacist Educational Supervisor (otherwise known as a Designated supervisor or, formerly, pre-registration tutor). Foundation training programmes in hospitals typically consist of a series of short block rotations in different areas, each lasting 1–3 weeks. During these short block rotations, trainees typically only work with members of the pharmacy team, where their role is largely observational. This can limit the trainee's ability to integrate into the multi-disciplinary team, which can have a negative impact on their professional development.[18,19]

1.3 | Communities of practice

Communities of practice learning theory describes how groups of people who come together to form a community of practice create a better social environment in which learning can take place. A community of practice is formed when a group of people share a joint enterprise (all working towards the same common cause), have a shared repertoire (use the same tools and resources) and exhibit mutual engagement (a willingness to work together).[20] When a person is new to a community of practice, they will initially exist at the periphery of the community; if they are to be a successful learner, they will need to transition to the centre of the community. Crucially, this takes time. The more time a person spends in a community of practice, the more opportunities they will have to interact with established members, learn effectively and acquire more responsibilities.[21] The LIC emphasis on time and continuity of relationships align to the principles of communities of practice learning theory, which has been widely applied in LIC research.[3,11,16,22]

1.4 | Aim

Drawing upon communities of practice learning theory, this study sought to determine whether a longitudinal placement was a viable training model for trainee pharmacists and, if so, how it became viable.

1.5 | Longitudinal placement design

The principles of an amalgamative LIC model were drawn upon to inform the design of a longitudinal placement.[1] The placement was incorporated as one rotation within the 1 year foundation training programme for trainee pharmacists. The placement design was developed in collaboration pharmacy, medical and nursing staff and involved trainee pharmacists working on one hospital ward, in the Older Persons Medicine (OPM) specialty, full-time (Mon-Fri; 9 am to 5 pm) for 13 weeks, in the second or third quarter of the foundation year.[18] An induction, timetable (Appendix S1), workbook and workplace assessment tools were created to support the trainees. The term 'longitudinal placement' was used to describe the training model since the phrase 'a type of amalgamative longitudinal integrated clerkship' may have perplexed the UK healthcare professionals this study sought to recruit.[23]

2 | METHODS

2.1 | Ethics statement

Ethical approval was obtained from the University of East Anglia Research and Ethics Committee (201819-003) and governance approval from the Health Research Authority (19/HRA/0416).

2.2 | Philosophical positioning of the researcher

In this study, the lead author (HK) adopted a pragmatic philosophical position. Pragmatism promotes a practical approach to research,

starting with the question of 'what works?'.[24–27] The pragmatic approach encourages researchers' freedom to utilise whichever methodology and methods are necessary to answer their research question(s).[24,28]

2.3 | Design-Based Research

A Design-Based Research (DBR) approach, part of the Educational Design Research family of approaches, was used to underpin the research design because it supports researchers to address complex educational challenges using an iterative approach.[29–34] DBR consists of three core phases: exploration/analysis (literature review, key stakeholder views gathered and practice context understood), design/construction (intervention is designed and is grounded in theory and reality; key stakeholders involved in design refinement) and evaluation/reflection (formal evaluation of the design for the purposes of generating data to inform outputs for the next iterative version).[35–38] The exploration/analysis and design/construction phases have been completed, and these findings are reported in the PhD thesis associated with this research.[18]

This study involved undertaking the evaluation/reflection phase of the longitudinal placement for trainees. Beta testing, to determine the local viability and institutionalisation of the intervention, informed the evaluation strategy, which underpinned the approach to data analysis. An intervention's local viability refers to how and why it can survive in the research context. Institutionalisation describes how an intervention can become incorporated as part of the organisation's routine practice.[39]

2.4 | Research context

Two acute hospitals in England agreed to host the longitudinal placement. Contextual information about each hospital, the ward hosting and the trainees participating is provided in Table 1.

The trainees undertook their longitudinal ward placement at different points during their workplace training year. When not undertaking their longitudinal placement, the trainees were undertaking short block rotations through different clinical and technical areas at their respective hospital. Both wards were staffed by medical consultants, junior doctors, a ward sister, deputy sisters, registered nurses, a discharge coordinator, ward clerk, physiotherapists, occupational therapists and a pharmacist.

2.5 | Participant recruitment

The deputy chief pharmacist at each hospital acted as a gatekeeper to recruitment, forwarding emails of invitation to potential participants on behalf of the research team.

2.6 | Qualitative longitudinal research

Qualitative longitudinal research involves collecting data from the same participants over time. This enables participants to describe changes that are happening in 'real time', allowing the analysis to relate changes to time.[40–42]

2.7 | Data collection

The research team developed semi-structured topic guides that were informed by the literature and study aims and customised for the relevant professional group (Appendices S2–S6). Participants were encouraged to provide honest and open answers prior to the commencement of the interview. The principles for conducting semi-structured qualitative interviews, as described by Brinkman and Kvale,[43] were followed. Interviews took place in meeting rooms at the hospitals. Participants provided informed written consent, and all interviews were audio-recorded, transcribed verbatim and anonymised.

2.8 | Data analysis

A pragmatic approach to analysis was applied, and a bespoke method was developed using trajectory analysis, framework analysis (underpinned by DBR) and abductive analysis.[24,44–46]

The trajectory analysis involved creating two coding trees for the trainee data. The first tree organised the data by time and the second by trainee (Appendix S7). The framework was inserted into each coding tree and included the following sections (which were derived from the DBR approach): Implementation, Local viability and Institutionalisation.

Initial coding of the data was undertaken using an abductive approach. The coded data were organised into the framework, with subthemes created. An 'unanticipated' section was added to the framework and during abductive analysis; any data which did not fit into the main framework were coded into the 'unanticipated' section.

TABLE 1 Hospital, ward and trainee context

Hospital	Ward specialty	Number of beds	Local pharmacist support	Trainee pharmacist	Weeks placement undertaken
1	OPM: Parkinson's Disease	28	~2 h/day	A	14–26
				C	27–40
2	OPM: Hip fractures	39	~2 h/day	B	23–35

Staff data were coded into a separate tree, which organised the data by trainee. The same framework consisting of the following sections was applied: Implementation, Local viability, Institutionalisation and Unanticipated. NVivo QSR International Version 12 was used to store and manage the data.

2.9 | Validation

Six validation strategies were used to confirm trustworthiness of the data: reflexivity, triangulation, rich descriptions, disconfirming evidence, prolonged engagement in the field and peer review.[47] The lead author (HK) kept a reflexive diary; entries were made following interviews and during analysis. The data and diary entries were discussed at regular intervals with the research team (DW, JS and MC).

3 | RESULTS

3.1 | Participants

All trainees approached for interview accepted. Most staff members approached for interview accepted, with the exception of the Pharmacist Educational Supervisor (also known as a tutor) for Trainee Pharmacist B. In total, 32 interviews were held with trainees and staff.

Each trainee was interviewed four times, at weeks: 0, 3/4/5, 7/8 and 14. Staff were interviewed once during week 14 (Table 2). Interviews with trainees at week 0 (prior to placement commencing) lasted fewer than 30 min. Interviews from week 3 onwards lasted a minimum of 60 min with each trainee.

Twenty interviews were conducted with 14 members of staff, lasting 7–30 min. Some staff were interviewed twice if they worked with two trainees. This is due to hospital 1 hosting two longitudinal placements sequentially on the same ward. These staff have two different identification codes attributed to them, depending on which trainee their interview was in relation to.

3.2 | Results

The main themes, informed by the framework, were Background (derived from the 'unanticipated' element of the framework), Implementation, Local Viability and Institutionalisation. This paper will only describe the Local viability theme, since these data answer the aim of this study. The results from the other themes can be viewed in the PhD thesis.[18] Additional quotes supporting the findings presented in this study can be found in Appendix S8.

3.3 | Local viability

Local viability describes how and why the longitudinal placement was able to survive. Over the course of the placement, each trainee identified that becoming part of the ward team: enriched their learning experience, supported their professional development, and improved the ward pharmacy service, which enhanced patient care.

3.3.1 | Part of the team

Effective working relationships were not established between the trainees and ward team during the initial weeks of the placement. TPC was uneasy about approaching staff with queries, preferring to leave post-it notes with instructions, rather than initiating conversations directly. Nursing staff initially took an authoritarian approach with TPA, giving her strict instructions on which activities to complete, rather than involving her in discussions about patients and their medicines.

Over time, the interactions between the trainees and ward team began to change. TPA was invited to participate in making decisions, TPB was sought out for answering queries and TPC was able to participate in social conversations regarding television shows and sports programmes. Each of these subtle changes in interactions between the staff and trainees indicated that there was a level of trust and acceptance of the trainees from week 7/8 onwards.

Pharmacist educational supervisors acknowledged that the increased length of the placement (relative to block rotations) improved the trainees' learning experience.

> … there's more that we [pharmacist educational supervisors] could contribute in … greater depth in a prolonged period [on a ward] … what I liked about it the most, it has … certainly improved … their learning …. PESA, Week 7

Certain features of the placement design influenced the speed at which each of the trainees was able to acquire membership within the ward team. Attending the multi-disciplinary meetings helped trainees to integrate into the ward team.

> … I didn't feel like I was 'in the way' on [longitudinal placement ward] which was quite nice … cos they [ward staff] all knew who I was and they knew why I was there and I was always around … I felt like I had a place on the ward and I fitted into the team …. TPB, Week 14

3.3.2 | Enriched learning experience

An inclusive learning environment was cultivated by the consultants (who were described as friendly and approachable) for all trainee healthcare professionals, including nurses, doctors and pharmacists. The consultants invited trainees to attend clinics and ward rounds

TABLE 2 Participant details

Participants' role	Hospital	Interview week	Participant ID	Participant ID
Trainee pharmacist A	1	0	TPA	-
		3		
		7		
		14		
Trainee pharmacist B	2	0	TPB	-
		4		
		7		
		14		
Trainee pharmacist C	1	0	TPC	-
		5		
		8		
		14		
Trainee Pharmacist A Staff				
Pharmacist Educational Supervisor 1	1	7	PESA1	-
Pharmacist Educational Supervisor 2		14	PESA2	WPC
Ward sister			WSA	WSC
Deputy sister			DSA	DSC
Staff nurse			SNA1	-
Staff nurse			SNA2	-
Consultant			CONSA	-
Junior doctor			CMTA	-
Trainee Pharmacist B Staff				
Ward pharmacist	2	14	WPB	-
Ward sister			WSB	-
Deputy sister			DSB	-
Staff nurse			SNB	-
Consultant			CONSB	-
Junior doctor			FY1B	-
Trainee Pharmacist C Staff				
Pharmacist Educational Supervisor	1	14	PESC	-
Ward pharmacist			WPC	PESA2
Ward sister			WSC	WSA
Deputy sister			DSC	DSA
Staff nurse			SNC	-
Consultant			CONSC	-

with them elsewhere in the hospital. Junior doctors, nurses, physiotherapists, occupational therapists and discharge coordinators also offered a variety of learning opportunities. These included completing last offices (TPA and TPB), attending home visits (TPB) and working in the day assessment unit (TPA and TPC). These additional activities were not part of the longitudinal placement design but arose because of the trainees' membership within the team.

> … one consultant … stops them [certain medicines] in every patient … I know certain drugs [he] will … always stop … it [this knowledge] makes me feel more useful on the ward … it's better to be part of a team because I feel like I'm learning a lot more …. TPB, Week 7

As well as identifying opportunities for learning during the placement, the trainees identified barriers to learning which centred on the availability, experience and motivations of the ward pharmacist to engage in training. If the ward pharmacist was inexperienced (TPA), or unavailable (TPC), this hindered the rate at which trainees became part of the team because their identify development was delayed. Staff mistook the trainees for registered pharmacists, which hampered access to learning opportunities.

3.3.3 | Development as a professional

The enriched learning experience contributed to the trainees' development as healthcare professionals. Their development was characterised by an increase in confidence and competence, which resulted in them acquiring more responsibilities for providing patient care, thereby reinforcing their sense of belonging within the ward team and supporting identity formation.

> … a lot of his [TPC's] evidences reflect … quite a lot of responsibility … on his behalf. So, I think that's really good … we sort of thrust him into the action and I think that prepares him more for once he's qualified …. PESC, Week 14

3.3.4 | Improved pharmacy service

The ward team described how, if pharmacists are not considered part of the ward team, it precludes them from making meaningful contributions to patient care and leads to poorer joint decision-making. Consultants were less likely to trust the prescribing advice of a pharmacist they did not know or work with. By comparison, since the trainees were able to integrate into the team over the course of their placement, they were able to support all the medicines-related activities, providing more person-centred medication advice, being available to answer medication queries, undertaking medication consultations with patients and optimising patient's medicines according to their condition(s).

> … when you get people [pharmacists] that just come up [to the ward] for the day, they don't understand … but they're [trainee pharmacists] ward based … they're forward thinking about discharges … it's their ward so it's their priority to make sure that they've got everything up and ready … there's a different way of thinking … I think it works much better this way … and I think she [TPA] feels like she belongs here … it's like coming back home all the time …. WSA, Week 14

Due to the trainees having a greater understanding of the ward environment and its demands, they devised 'workarounds' to bypass some of the pharmacy rules regarding how quickly, or in what order, medicines were dispensed for patients, thus demonstrating empathy with the challenges faced by the nurses regarding pharmacy-related medication delays.

> … it's [the placement] mutually beneficial, from our perspective you have a pharmacist presence on the wards on a regular basis, and for a longer period, and that can benefit us in many ways, seeking information, ensuring we have the necessary medication available on time … it greatly enhances the discharge process … from their [trainee pharmacist] perspective … it's a positive learning experience for them. So, I feel that's why it benefits both of us. CONSC, Week 14

The longitudinal placement gave the trainees a context in which they could practise being a pharmacist in a multi-disciplinary team. They sought to model their practice on the behaviour and attributes of the ward team, which changed the way they contributed to patient care. Re-evaluating how they provided pharmaceutical care to patients resulted in the trainees realising that their patients did not always present as perfect 'textbook cases'. Hence, clinical guidelines and recommended treatment pathways could not always be applied to each patient, particularly if they had multiple long-term conditions. This enabled the trainees to learn about the importance of providing personalised care for each patient based on their medical condition(s) and lifestyle choices.

> … it [the longitudinal placement] enables her [TPB] to see a slightly different side and think about things in a different way … she ended up seeing patients less as drug charts and more as patients …. CONSB, Week 14

All participants recommended the inclusion of the longitudinal placement in subsequent pharmacist training programmes. The placement shaped the trainees into better future pharmacists who understood the value of, and how to become, part of the multi-disciplinary team.

> it's [the longitudinal placement] got to make a better pharmacist at the end. To have an understanding of … the entire team on the ward, the patient journey … the valuable input the pharmacy element is … that makes a big impact …. DSB, Week 14

Staff participants pointed out repeatedly that the apparent success of the longitudinal ward placement was partially due to the individual trainees who were friendly, motivated and made an effort to integrate into the team. Staff cautioned that not all trainees would be motivated to integrate and that failure to do so would hinder their learning experience and increase the pressure on staff to deliver the longitudinal placement.

4 | DISCUSSION

In line with the communities of practice learning theory, trainees acquired membership within the multi-disciplinary ward team over time, leading to an enriched learning experience and improved professional development. This resulted in the provision of an enhanced pharmacy ward service and improved patient care, thereby enhancing local viability.

The ward teams exhibited the characteristics of communities of practice, which created a supportive learning environment for the

trainees. Membership within the community of practice gave the trainees unrestricted access to the multi-disciplinary team, whom they could ask questions of, seek regular advice from and participate in a variety of activities that contributed to patient care. Staff emphasised the importance of trainees being sufficiently motivated to acquire membership within the community in order to derive an enhanced learning experience. The longitudinal qualitative analysis revealed all trainees became members of the ward community of practice by week 8. It does take time for a newcomer to be accepted into a community of practice.[21] Hence, ward placements which last for fewer than 8 weeks may not allow trainees to acquire membership within a ward community of practice. This could affect the local viability of the placement, since membership within the community of practice was a prerequisite to the trainee's enriched learning experience.

Through the acquisition of membership within the ward community of practice, the trainees gradually earnt the trust of the multidisciplinary team. This expression of trust from staff to trainee was recognised in the responsibilities the trainees gathered, such as answering medication queries and participating in decisions about patient's care. Having these responsibilities supported the trainee's professional development and improved their confidence. Securing trust from staff, leading to increased responsibilities and independence for trainee healthcare professionals, is a repeating theme in the LIC literature.[16] The tangible professional development benefits to the trainees that arose from the longitudinal placement contribute to securing the local viability of the placement from the perspective of the trainees.

Membership within the ward community of practice also enabled the trainees to enhance the pharmacy service. The longitudinal placement design made it possible for the trainees to work full-time on one ward for 13 weeks. This helped the trainees to better realise the joint enterprise of the ward, to provide excellent patient care and identify how they could contribute to it. This resulted in the trainees creating 'workarounds' to obtain medicines for their patients and improve the speed at which discharge prescriptions were fulfilled. The improved discharge service for patients affirmed the local viability of the longitudinal placement from the perspective of the staff. This is an important finding given that it is not widely known what effect LICs have on patient care.[3]

The findings from this study highlight the importance of the trainee acquiring membership within the community of practice so that the longitudinal placement becomes a viable training model from the perspective of trainees, staff and patients. Supporting trainees to acquire membership within communities of practice could enable longitudinal placements to be sustainable over time.

Whilst all the trainees in this study were able to acquire membership within the ward community of practice, the longitudinal placement design cannot guarantee this. A trainee could fail to acquire membership within a community of practice during a longitudinal placement due to: trainee apathy, an unwelcoming attitude of staff, poor placement design or inadequate implementation.[20] Failure to acquire membership for any number of reasons could affect the local viability of the longitudinal placement, resulting in its discontinuation. However, longitudinal placements do increase the likelihood of a trainee acquiring membership within a community of practice due to the design's emphasis on time and continuity of relationships.

Longitudinal qualitative research methods, which enable study findings to connect time to change, are underutilised within medical education.[42,48] Given that time is one of the central tenets of the LIC and longitudinal placement design, use of such methods is appropriate. This enabled the identification of the timepoint at which transition into membership within the community of practice occurred for all trainees. Certain features of the placement design appeared to influence the speed and extent each trainee was able to acquire membership, such as the presence/role of the ward pharmacist and access to the multi-disciplinary team meetings. However, whilst the trainees acquired membership in the community of practice by a certain point, this does not necessarily mean that once membership is achieved; the placement should discontinue. If the trainees do not have sufficient time to make a meaningful contribution to patient care before the end of their placement, this may affect the local viability of the placement from the perspective of the staff and patients.

Communities of practice has provided a useful lens through which to interpret the findings from this study, namely, that the acquisition of membership within a community of practice affirms the local viability of the longitudinal placement for trainees, staff and patients. In addition, utilisation of learning theory to interpret study findings improves the transferability of the longitudinal placement design to other settings.[29] Other concepts that could have been used to interpret the findings from this study, such as the Practice of Communities or Workplace Participatory Practices, may have provided an alternative interpretation of study findings.[49,50]

Using DBR to develop the longitudinal placement design and inform the evaluation strengthens the study findings. Its emphasis on the use of multiple stakeholders, the application of learning theory and taking an iterative approach enabled a complex intervention to be created and evaluated in a short period of time, with a small research team. To the knowledge of the authors, this is the first time that the DBR approach has been used to design and evaluate a longitudinal placement or model of training based upon the amalgamative LIC design. Therefore, utilisation of the DBR approach may support education researchers from different professional disciplines to design, implement and evaluate educational interventions, for learners in their setting(s).

This study involved a small number of trainee pharmacists, which may limit the transferability of findings. However, multiple interviews with the trainees over time generated rich data and prolonged the engagement of the researcher in the field, reducing social desirability bias.[47] In addition, the triangulation of the trainee's experience with staff from different professional groups strengthens the study findings as this mitigates against social desirability bias affecting overall findings.[47]

There is limited disconfirming evidence amongst the staff data, which could indicate an unwillingness to criticise the placement. This could have been due to the role of the researcher (HK) as a pharmacist and the designer and evaluator of the placement. Whilst the

researcher tried to prevent this by emphasising the importance of honesty prior to each interview, it is possible that participants chose not to disclose any criticisms or reservations about the placement directly.

This research demonstrates the value of qualitative longitudinal research when considering learning over time.[51] Utilising the DBR approach to design, implement and evaluate learning experiences increases the likelihood of developing an educational intervention that works, therefore minimising risk to the learner.[52] Applying learning theory to study findings to conceptualise new knowledge enhances the education intervention's transferability to other settings.[29]

The findings from this study indicate that further exploration is needed to establish whether the focus for longitudinal models of training should be on supporting trainee healthcare professionals to acquire membership within communities of practice. In addition, more research into the local viability of longitudinal training models and their effect on patient care warrant further investigation.

ACKNOWLEDGEMENTS

Thanks to Hospitals 1 and 2 for partially funding the PhD studentship and to the staff and trainees who participated in this research.

FUNDING

None.

CONFLICT OF INTEREST

None.

ETHICS STATEMENT

Ethical approval (service evaluation) was granted by the University of East Anglia Research Ethics Committee (ref 201819-003) and governance approval from the Health Research Authority (ref 19/HRA/0416).

AUTHOR CONTRIBUTIONS

Hannah Kinsey: Conducted the interviews, completed the data analysis and wrote this paper. Satisfying criteria 1,2,3,4. Jeremy Sokhi: Supervised Hannah during interview data collection, supported interpretation of results and provided extensive feedback on this manuscript. Satisfying criteria 1,2,3,4. Maria Christou: Supported the design of this study, supported the interpretation of results and provided extensive feedback on this manuscript. Satisfying criteria 1,2,3,4. David Wright: Responsible for overall supervision of Hannah, conception of the study, interpretation of the results and has provided extensive feedback on this manuscript. Satisfying criteria 1,2,3,4. All authors have given final approval for this manuscript.

ORCID

Hannah Kinsey https://orcid.org/0000-0003-3640-6179
Jeremy Sokhi https://orcid.org/0000-0001-8501-1224

REFERENCES

1. Worley P, Couper I, Strasser R, Graves L, Cummings BA, Woodman R, Stagg P, Hirsh D, The Consortium of Longitudinal Integrated Clerkships (CLIC) Research Collaborative. A typology of longitudinal integrated clerkships. *Med Educ*. 2016;50(9):922-932. https://doi.org/10.1111/medu.13084
2. Brown MEL, Whybrow P, Kirwan G, Finn G. Professional identity formation within longitudinal integrated clerkships: a scoping review. *Med Educ*. 2022;55(8):912-924. https://doi.org/10.1111/medu.14461
3. Bartlett M, Couper I, Poncelet A, Worley P. The do's, don'ts and don't knows of establishing a sustainable longitudinal integrated clerkship. *Perspect Med Educ*. 2020;9(1):5-19. https://doi.org/10.1007/s40037-019-00558-z
4. Poncelet A, Hirsh D. Background, definitions, history. In: Poncelet A, Hirsh D, eds. *Longitudinal Integrated Clerkships: Principles, Outcomes, Practical Tools, and Future Directions*. 1st ed. Gegensatz Press; 2016:1-8.
5. Norris TE, Schaad DC, DeWitt D, Ogur B, Hunt DD, Consortium of Longitudinal Integrated Clerkships. Longitudinal integrated clerkships for medical students: an innovation adopted by medical schools in Australia, Canada, South Africa, and the United States. *Acad Med*. 2009;84(7):902-907. https://doi.org/10.1097/ACM.0b013e3181a85776
6. Hirsh DA, Ogur B, Thibault GE, Cox M. "Continuity" as an organizing principle for clinical education reform. *N Engl J Med*. 2007;356(8):858-866. https://doi.org/10.1056/NEJMsb061660
7. Walters L, Greenhill J, Richards J, Ward H, Campbell N, Ash J, Schuwirth LWT Outcomes of longitudinal integrated clinical placements for students, clinicians and society. *Med Educ*. 2012;46(11):1028-1041. https://doi.org/10.1111/j.1365-2923.2012.04331.x
8. Bell SK, Krupat E, Fazio SB, Roberts DH, Schwartzstein RM. Longitudinal pedagogy: A successful response to the fragmentation of the third-year medical student clerkship experience. *Acad Med*. 2008;83(5):467-475. https://doi.org/10.1097/ACM.0b013e31816bdad5
9. Zink T, Halaas GW, Finstad D, Brooks KD. The rural physician associate program: the value of immersion learning for third-year medical students. *J Rural Heal*. 2008;24(4):353-359. https://doi.org/10.1111/j.1748-0361.2008.00181.x
10. O'Brien BC, Poncelet AN, Hansen L, Hirsh DA, Ogur B, Alexander EK, Krupat E, Hauer KE. Students' workplace learning in two clerkship models: a multi-site observational study. *Med Educ*. 2012;46:613-624. https://doi.org/10.1111/j.1365-2923.2012.04271.x, 6
11. Walters L, Prideaux D, Worley P, Greenhill J. Demonstrating the value of longitudinal integrated placements to general practice preceptors. *Med Educ*. 2011;45(5):455-463. https://doi.org/10.1111/j.1365-2923.2010.03901.x
12. O'Donoghue S, McGrath D, Cullen W. How do longitudinal clerkships in general practice/primary care impact on student experience and career intention? A cross-sectional study of student experience. *Educ Prim Care*. 2015;26(3):166-175. https://doi.org/10.1080/14739879.2015.11494336
13. Ogur B, Hirsh D, Krupat E, Bor D. The Harvard Medical School-Cambridge Integrated Clerkship: an innovative model of clinical education. *Acad Med*. 2007;82(4):397-404. https://doi.org/10.1097/ACM.0b013e31803338f0
14. Hirsh D, Gaufberg E, Ogur B, Cohen P, Krupat E, Cox M, Pelletier S, Bor D. Educational outcomes of the Harvard medical school-Cambridge integrated clerkship: a way forward for medical education. *Acad Med*. 2012;87(5):643-650. https://doi.org/10.1097/ACM.0b013e31824d9821
15. Gheihman G, Jun T, Young GJ, Liebman D, Sharma K, Brandes E, Ogur B, Hirsh DA. A review of longitudinal clinical programs in US medical schools. *Med Educ Online*. 2018;23(1):1-9. https://doi.org/10.1080/10872981.2018.1444900

16. Thistlethwaite JE, Bartle E, Chong AAL, Dick ML, King D, Mahoney S, Papinczak T, Tucker G A review of longitudinal community and hospital placements in medical education: BEME Guide No. 26. *Med Teach*. 2013;35(8):e1340-e1364. https://doi.org/10.3109/0142159X.2013.806981
17. McKeown A, Mollaney J, Ahuja N, Parekh R, Kumar S. UK longitudinal integrated clerkships: where are we now? *Educ Prim Care*. 2019;30(5):270-274. https://doi.org/10.1080/14739879.2019.1653228
18. Kinsey H. Integrating a longitudinal ward placement into the hospital pharmacist pre registration year: a design-based research approach. Published online 2020.
19. Jee SD, Schafheutle EI, Noyce PR. Exploring the process of professional socialisation and development during pharmacy preregistration training in England. *Int J Pharm Pract*. 2016;24:283-293. https://doi.org/10.1111/ijpp.12250, 4
20. Wenger E. Communities of practice: learning, meaning, and identity. *Cambridge University Press*; 1998:45-102. https://doi.org/10.2277/0521663636
21. Lave J, Wenger I. *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press; 1991.
22. Konkin DJ, Suddards C. Students' experiences of role, relationships and learning in two clerkship models. *Med Educ*. 2017;51(5):490-497. https://doi.org/10.1111/medu.13268
23. Harding A. A rose by any other name; longitudinal (integrated) placements in the UK and Europe. *Educ Prim Care*. 2019;30(5):317-318. https://doi.org/10.1080/14739879.2019.1666306
24. Morgan DL. Pragmatism as a paradigm for social research. *Qual Inq*. 2014;20(8):1045-1053. https://doi.org/10.1177/1077800413513733
25. Hall JN. Pragmatism, evidence, and mixed methods evaluation. In: Mertens DM, Hesse-Biber S, eds. *Mixed Methods and Credibility of Evidence in Evaluation. New Directions for Evaluation*; Wiley. 2013:15-26. https://doi.org/10.1002/ev
26. Creswell JW, Poth CN. Philosophical assumptions and interpretive frameworks. In: *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. 4th ed. Sage Publications; 2017:15-40.
27. Burke Johnson R, Christensen L. Educational research: quantitative, qualitative, and mixed research. In: Johnson R, Christensen L, eds. *Educational Research: Quantitative, Qualitative, and Mixed Approaches*. 5th ed. Sage Publications Ltd; 2014:Online. https://ismailsunny.files.wordpress.com/2017/07/educational-research_-quantitat-r-robert-burke-johnson.pdf
28. Johnson RB, Christensen L. Action Research for Lifelong Learning. In: *Educational Research: Quantitative, Qualitative, and Mixed Approaches*. 5th ed. Sage Publications Ltd; 2014:115-141. https://ismailsunny.files.wordpress.com/2017/07/educational-research_-quantitat-r-robert-burke-johnson.pdf
29. Barab S, Squire K. Design-based research: putting a stake in the ground. *J Learn Sci*. 2004;13(1):1-14. https://doi.org/10.1207/s15327809jls1301
30. McKenney SE, Reeves TC. About educational design research. In: *Conducting Educational Design Research*. 2nd ed. Taylor & Francis; 2018:6-33.
31. Wang F, Hannafin MJ. Design-based research and technology-enhanced learning environments. *Educ Technol Res Dev*. 2005;53(4):5-23. https://doi.org/10.1016/s0965-2302(04)00056-6
32. Anderson T, Shattuck J. Design-based research: A decade of progress in education research? *Educ Res* 2012;41(1):16-25. https://doi.org/10.3102/0013189X11428813
33. van den Akker J, Bannan B, Kelly A, Nieveen N, Plomp T. *Educational Design Research. Part A: An Introduction*. (Plomp T, Nieveen N, eds.). SLO, The Netherlands Institute for Curriculum Development; 2013. https://doi.org/10.1007/978-1-4614-3185-5_11
34. Getenet S. Using design-based research to bring partnership between researchers and practitioners. *Educ Res*. 2019;61(4):482-494. https://doi.org/10.1080/00131881.2019.1677168
35. McKenney SE, Reeves TC. Analysis and exploration. In: *Conducting Educational Design Research*. 1st ed. Routledge; 2012 online.
36. McKenney SE, Reeves TC. Toward a generic model for educational design research. In: *Conducting Educational Design Research*. 1st ed. Routledge; 2012 online.
37. McKenney SE, Reeves TC. Design and construction. In: *Conducting Educational Design Research*. 1st ed. Routledge; 2012 online.
38. McKenney SE, Reeves TC. Evaluation and reflection. In: *Conducting Educational Design Research*. 1st ed. Routledge; 2012 online.
39. McKenney SE, Reeves TC. Evaluation and reflection. In: *Conducting Educational Design Research*. 2nd ed. Routledge; 2018:161-198.
40. Neale B. Introducing qualitative longitudinal research. In: *What Is Qualitative Longitudinal Research?* Bloomsbury; 2019:1-22.
41. Holland J, Thomson R. Gaining perspective on choice and fate. *Eur Soc*. 2009;11(3):451-469. https://doi.org/10.1080/14616690902764799
42. Balmer DF, Varpio L, Bennett D, Teunissen PW. Longitudinal qualitative research in medical education: time to conceptualise time. *Med Educ*. 2021;55(11):1253-1260. https://doi.org/10.1111/medu.14542
43. Brinkmann S, Kvale S. Conducting an interview. In: *Interviews: Learning the Craft of Qualitative Research Interviewing*. 3rd ed. Sage Publications; 2015:149-166.
44. Grossoehme D, Lipstein E. Analyzing longitudinal qualitative data: the application of trajectory and recurrent cross-sectional approaches. *BMC Res Notes*. 2016;9(1):1-5. https://doi.org/10.1186/s13104-016-1954-1
45. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol*. 2013;13(117):1-8.
46. Tavory I, Timmermans S. Introduction: toward abductive analysis. In: *Abductive Analysis Theorizing Qualitative Research*. In: The University of Chicago Press; 2014:1-8.
47. Creswell JW, Poth CN. Standards of validation and evaluation. In: *Qualitative Inquiry and Research Design: Choosing among Five Approaches*. 4th ed. Sage Publications; 2017:253-286.
48. Neale B. Journeys with data: field enquiry and analysis. In: *What Is Qualitative Longitudinal Research?* Bloomsbury; 2019:91-118.
49. Gherardi S. Community of practice or practices of a community? In: Armstrong S, Fukami C, eds. *The SAGE Handbook of Management Learning, Education and Development*. Sage; 2009:514-530. https://doi.org/10.4135/9780857021038.n27
50. Billett S. Workplace participatory practices: conceptualising workplaces as learning environments. *J Work Learn*. 2004;16(6):312-324. https://doi.org/10.1108/13665620410550295
51. Neale B. *What Is Qualitative Longitudinal Research?* Bloomsbury; 2018.
52. Plomp T, Voogt J. Pedagogical practices and ICT use around the world: Findings from the IEA international comparative study SITES2006. *Educ Inf Technol*. 2009;14(4):285-292. https://doi.org/10.1007/s10639-009-9090-3

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

How to cite this article: Kinsey H, Sokhi J, Christou M, Wright D. Longitudinal placements for trainee pharmacists: Learning whilst improving patient care. *Med Educ*. 2022;56(2):220-228. doi:10.1111/medu.14684