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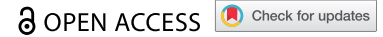
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RESEARCH ARTICLE



# Context and mechanisms of interprofessional learning during a Longitudinal Integrated Clerkship

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## ABSTRACT

Longitudinal Integrated Clerkships (LIC) are known to afford several educational advantages to healthcare students including superior team working skills. This paper explores the perceptions of undergraduate medical students who undertook a rural LIC in Scottish primary care setting, to develop an understanding of their interprofessional learning (IPL) during the LIC placement. A qualitative approach was used to explore the lived experience of five LIC alumni who participated in this longitudinal study. They shared their experiences through written and audio diaries over a period of 1–2 months followed by individual semi-structured interviews. Transcripts were thematically analyzed to identify key themes related to IPL during LIC placements. Data from 12 audio and 9 written diaries and 5 interviews generated the following inter-woven themes with regards to various contextual factors, and the prominent generative mechanisms underlying the positive IPL experience: general practice setting afforded interprofessional interactions, longitudinality afforded interprofessional relationships, engagement in nurturing clinical teams, absence of hierarchy, flexibility and autonomy during the LIC, and ‘goodwill’ expressed toward the LIC programme. The significant interplay of enabling contextual factors and the generative mechanisms operating in the primary care practice environment is presented in context of existing research and proposed future developments.

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## KEYWORDS

Longitudinal Integrated Clerkship; Interprofessional Learning; Undergraduate medical education; context; mechanism

## Introduction

Longitudinal Integrated Clerkships (LIC) are a model of clinical education involving extended placements during which students learn while contributing to patient care, through immersion in the professional and social community (Hudson et al., 2017). LICs were originally developed to positively influence recruitment of medical graduates to remote and rural settings. The underpinning principle in LIC placements is “continuity” with respect to patients, supervisors, and clinical teams, which leads to an enhanced learning experience for students. The longitudinal placements in a steady clinical environment offer opportunities for students to interact and learn from a variety of healthcare professionals (HCP) such as nurses, pharmacists, midwives, physiotherapists, and radiographers; hence, creating a fertile landscape for interprofessional learning (IPL). IPL has been suggested to prepare healthcare students to work in a more collaborative, flexible and efficient way to eventually positively impact patient outcomes (Barr et al., 2013).

Despite numerous studies focusing on formal interprofessional education programmes, the value of informal IPL opportunities in the clinical environment is currently unrealized (Nisbet et al., 2013). There are previous reports of greater interprofessional teamwork skills amongst LIC learners, owing to both formal and informal interprofessional interactions (Myhre et al., 2014; Walters et al., 2012). However, less is known regarding the underlying mechanisms contributing

toward this outcome. This educational attribute of LICs is worthy of in-depth exploration to inform curricular intervention strategies. In the UK, effective interprofessional working in clinical teams is recognized as a learning outcome for medical undergraduates (General Medical Council, 2018). Positive interprofessional working is projected to ensure patient safety, reduce unnecessary hospital admissions and improve cost-effectiveness of health services provisions (Institute of Medicine (IOM), 2015). This paper describes students’ perceptions of workplace learning and interprofessional interactions within a Scottish rural LIC setting and the mechanisms underlying effective IPL.

## Background

Effective interprofessional behavior in the workplace develops over time and is considered to be a result of a complex reciprocal interaction between people and their environment according to socioecological theory (Bluteau et al., 2017). Thus, educating students in one environment versus another matters. LIC learners have reported a deep engagement with healthcare community involving social, educational, and professional relationships with a range of professionals including nurses, physiotherapists, speech pathologists, and pharmacists (Roberts et al., 2017). Allport et al.’s (1954) intergroup contact theory highlights the need to support more effective and purposeful interaction between HCPs to improve interprofessional relationships and working (Mohaupt et al., 2012). The

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immersive nature of LIC placements is known to foster reciprocal relationships between LIC students and other members of the clinical teams which positively impacts learner experience (Gupta & Howden, 2020). An understanding of “how” LIC placements lead to authentic IPL for medical undergraduates will be useful to design relevant curricular renewal strategies and related faculty development programmes.

The literature on pedagogical contributions of the LIC programmes is predominantly based on studies in the US, Canada, and Australia. The LIC scenario in the UK context is still in its infancy, possibly owing to significant differences in demographics, the geographies, student profiles, and structure of health systems (Harding, 2019). However, the primary care recruitment crisis has accelerated LIC implementations with contextual adaptations (McKeown et al., 2019). In 2016, the School of Medicine at the University of Dundee (UoD) introduced an optional LIC programme- the Dundee-LIC (DLIC) in Scottish rural primary care setting (Bartlett et al., 2019). DLIC is the UK’s first comprehensive LIC (Worley et al., 2016), which means that it spans the full academic year with no specialty-specific blocks during which the students maintain continuity with patients, supervisors, and clinical teams.

The present study was conducted to research students’ perceptions of their learning during the DLIC year and their experience of transitioning back into a traditional hospital clerkship environment. The first author is a lecturer in the medical school at UoD, and the second author is a medical education expert faculty; both have educational roles in the school but no direct involvement in the DLIC programme. The authors described the UoD undergraduate medical programme in detail in a previous publication on community attributes of DLIC placements (Gupta & Howden, 2020). Study participants reported having a very fulfilling learning experience of working in multidisciplinary primary care teams during their LIC year. They described their experiences of learning from a range of HCPs, through interprofessional interactions involving both cognitive and affective domains. This was perceived as valuable to build students’ clinical knowledge and skills enabling them to provide optimum patient care, as well as develop genuine regard and respect for other HCPs. The LIC learners reported confidence in communicating and collaborating with other professionals due to an authentic understanding of their roles and responsibilities. These findings motivated the research team to undertake a secondary analysis of the data to develop an understanding of “how” LIC placements lead to authentic IPL for medical undergraduates.

## Methods

A qualitative longitudinal study was conducted to explore the lived experience of students who undertook the DLIC placements. The undergraduate medical programme at UoD follows a spiral integrated curriculum over a period of 5 years, with the DLIC strand being offered to the 4<sup>th</sup> year medical students on an optional basis. Only a small number of students (7–8) have pursued this new elective each year since its introduction in 2016. This self-selecting small cohort of 4<sup>th</sup> year students are placed in general practice (GP) surgeries across rural Scotland for the entire

academic year. Owing to diversity in geographical location, there are unavoidable variations in individual DLIC placements due to GP practice size and characteristics. The DLIC students re-join the main cohort for the final year of their course which takes place in an urban tertiary hospital setting.

## Participants

Eight final year students who had undertaken the DLIC placements (in their penultimate year) were identified and sent an invitation to participate in the study by the medical school administrative team. Five of these students responded and agreed to participate in the study.

## Ethical considerations

Informed consent was obtained from all participants, and ethical approval was secured from UoD school ethical committee (SMED REC Number: 148/18).

## Data collection

We collected data longitudinally to obtain a deep understanding of the students’ world through time because qualitative longitudinal research is known to foster trust between the researcher and the subjects (Murray et al., 2009). In addition, it can effectively capture continuity in student responses as well as any change (Holland, 2011). Interested participants shared their learning experiences through written and audio diaries (AD) over a period of 1–2 months. Students uploaded these on to a secure online UoD repository to which only the researchers had access. The issues narrated in longitudinal diaries were followed-up in individual semi-structured interviews with each of the participants.

## Data analysis

Student transcripts were thematically analyzed to identify key themes related to IPL during the LIC placement. An iterative thematic analysis was informed by the six-step qualitative data analysis of Braun and Clarke (2006). Memos maintained during the data collection, and constant comparison of longitudinal data from diaries and interview scripts improved confirmability during coding and generating themes. The researchers attempted data triangulation through use of different research instruments (diaries and interviews) and time triangulation through collecting and comparing data at multiple points in time. Triangulation involves the use of multiple methods and aids in cross-examining the integrity of participants’ responses (Anney, 2014). Authentication of spontaneous data from longitudinal diaries with the well-developed accounts in the end-of-year interviews added rigor and confirmed changes in the subjects’ thoughts with the passage of time. Trustworthiness of the data was further enhanced by confirming preliminary codes with the supervising researcher and revisiting student transcripts in parts and whole.

## Results

The five study participants shared their clerkship experiences through written and audio diaries, and semi-structured interviews. An earlier publication by the authors (Gupta & Howden, 2020) describes the demographic characteristics of the five study subjects (2 males and 3 females, aged 20 to 30 years), and the details of the diaries (number and type- written versus audio). UoD online repository received a total of 21 diaries- 12 audio and 9 written. The length of ADs varied from 1 minute 20 seconds to 7 minutes 35 seconds. Semi-structured interviews were conducted with each of the five participants to probe issues shared in the longitudinal diaries. The length of the individual interviews ranged from 52 minutes to 105 minutes with an average of 73.4 minutes.

The focus of the primary study was to develop insights into the learning and transition experiences of DLIC alumni and the preparation afforded by a year-long LIC in a Scottish rural primary care setting. Along with specific transition-related findings reported in an earlier publication (Gupta & Howden, 2021), students also described an authentic IPL during the DLIC placements. Additionally, the study participants being final year students (now in a traditional hospital rotational clerkship) were in a position to compare and comment on the interprofessional encounters in both the clerkship models. Although not the focus of the primary research, the valuable glimpse into these inherent differences evident in student transcripts motivated the researchers to revisit the data, and develop an understanding of the context and mechanism of IPL during LICs. Below the authors present the themes from a secondary analysis of the DLIC alumni's diaries and interview transcripts, categorized as *contextual factors* and *generative mechanisms*. Each of these is comprised of inter-related themes, which are supported with representative quotations to ensure the results are faithful to the students' own words.

### Contextual factors

Study subjects' accounts indicated that the unique context of DLIC played a key role in enabling a fruitful IPL for the students. The primary care context where several HCPs were a part of a "single team," and the LIC student was integrated into this singular team led to an authentic insight into the role of different professionals in patient care. Along with the GP setting, longitudinality in the LIC programme allowed relationship building and transdisciplinary respect which further scaffolded rich IPL for the study subjects as indicated in the student quotations below.

### GP setting afforded interprofessional interactions

LIC students highlighted that primary care in their experience offered a great exposure to a wide range of HCPs involved in patient care. "GP is one of the best places to spend time with other members of the team" (Participant 1). The DLIC placements allowed learners to become an active member of the team, generating opportunities to interact with other professionals and develop an authentic insight into their role.

During DLIC you are also continuously trying to seek out opportunities with the other members of the multi-disciplinary team,

there was a lot of that in my practice, there were lots of opportunities. So, there was a pharmacist onsite for for the practice, there was midwives on site, you could go on joint visits, because they got people in. There was Physiotherapy on site, there was X-Ray on site Monday to Friday. Ya. So I was quite fortunate! (Participant 5)

This subject described this shared learning process and how it happened organically, as the students themselves were involved in patient care; they recognized each professional's contribution and learned to work collaboratively toward the common goal of treating the patient.

In 4<sup>th</sup> year (DLIC), I worked in a lot of multi-professional teams, I don't think I thought about it too much at the time. As you come to know about the process, in terms of what is happening with the patient. This person does this for the patient, this person does this. It was all dedicated to specific people. [...] Physiotherapists are much more experienced in assessing a joint. A GP would do a basic joint exam, having a look, but really, it's just not their specialty and it's a waste of their time. [...] I did a couple of days working with the reception staff [...] And then I worked in the Pharmacy for a couple of days, like a placement. I don't know if you can call receptionists a part of the healthcare team but they are getting more and more training, they do so much signposting, giving so much information on the phone, working with doctors and nurse practitioners, there is quite a lot to it. (Participant 2)

Students drew contrast with the earlier years in the traditional hospital setting, when they were ignorant of the role, training pathway and expertise of other HCPs.

I didn't even know who a "nurse practitioner" was before, but I have had so much experience now. The surgery (DLIC) I was in had a nurse practitioner trainee, and she often came to our tutorials [...] Now I feel like I do know, I have worked so closely with them. (Participant 2)

### Longitudinality afforded interprofessional relationships

According to the study subjects, the longitudinal nature of the clerkship led to a reciprocal feeling, between team members and students, of interest and investment. There was scope to develop strong learning associations with various HCPs owing to the extended placement in one area. LIC learners perceived reciprocal enthusiasm toward students from several team members and not only from their supervisors. In the quotation below, the student expresses the nature of the relationship between the practice and the student in their phrase: 'that GP Surgery's student', suggestive of the practice, as a whole, adopting the student as their own.

I found it much easier in DLIC. [...] the team members were all fairly interested and quite invested in, because it was such a long term thing. [...] When you are following the DLIC model, you are kind of that GP surgery's student. They are quite interested in making sure that you get a good learning experience out of LIC [...] like quite an interesting place for students to work in. [...] They seem to like having students. (Participant 3)

The longitudinality aided inclusion in all team activities and created more opportunities for working collaboratively which was appreciated as enjoyable by this learner: "I forgot to mention I had 2 whole days in the Pharmacy as part of DLIC last year. [...] They had got this new robotic system, [...] the robot picks everything, that was very interesting!" (Participant 2)



## Generative mechanisms

### Engagement in nurturing clinical teams

LIC learners perceived enthusiasm amongst other team members as they welcomed and integrated them in various patient care activities. Transcripts indicated that the feeling of belonging extended to the wider practice community, with students feeling cared for and relaxed when approaching a range of practice members with any queries.

And even the more you spoke to people and made yourself kind of known, people would phone and say, “I have got this, do you want to come and see it?” Or “I have seen this on an x-ray, do you want to see it?”, “There is a man who is coming to A&E with this, do you want to come and see it with me?” (Participant 5)

It was such a wide range of team, [...] you just knew that you could go and speak to them face to face, have a cup of tea, and get a problem sorted, as simple as that. [...] There I felt like a member of the team, a member of the staff, you know a “staff only” door, I felt it was fine to walk through, whereas here I am like “oh, Staff only!!”. (Participant 2)

### Absence of hierarchy

The study subjects reported a lack of interprofessional hierarchy or a staff-student divide when learning through the LIC year. This was perceived as nurturing a pleasant and inclusive feel for the LIC students who were placed in a remote and rural environment for the academic year.

I just remembered; it’s interesting. All the staff, the doctors over there introduced themselves to me by their first names. And also the receptionist and the nurses over there called the doctors by their first name, which was really nice. It kind of removed any feeling of hierarchy. (Participant 3)

Students observed interprofessional respect amongst team members as they shared their ideas and opinions on clinical problems and sought advice from relevant HCPs. LIC learners described the primary care learning environment as, student friendly and non-intimidating, a place where they could comfortably share their knowledge gaps and weaknesses.

The GP environment is different [...]. I feel like there is less of a hierarchy. The nurses, kind of question the GP opinion more in the GP setting, [...] where as in the hospital environment, I can’t imagine a nurse saying that to a consultant!!...questioning!! I really just can’t!!

For us as medical students, I didn’t feel our questions were stupid or feel intimidated. [...] That idea of a hierarchy, don’t think it’s there in general practice not to the same extent. (Participant 4)

The working and personal relationships between various HCPs witnessed during LIC was not the same as what they encountered in the traditional hospital environment. Students perceived the divide between different professional groups in the hospital clinical environment as illustrated below-

In the hospital nurses are nurses and doctors are doctors. [...] I was like “You don’t know her name!! she has worked here for 2 months!” Because there is just this DIVIDE of medical and nursing staff. And it was such a good team in Perth (Urban teaching hospital), the doctors team had lunch together, and dinner every fortnight, and the nurses’ team was great, they looked after patients well, were always jolly and happy, there were no team issues. But

they were 2 different teams doing their own things ... interacting sometimes. (Participant 2)

### Flexibility and autonomy

The less structured nature of LIC placements demanded students to self-organize the learning opportunities with the range of HCPs. This allowed learners the autonomy to select and pursue the personals or learning experiences which they perceived more useful; thereby, ensuring student engagement: “Some of the midwives in my LIC taught me quite a lot [...] There were professionals that we thought were particularly good at their job and we thought could teach us specific things, we got involved with them.” (Participant 1)

### Goodwill toward the programme

The DLIC is a relatively new educational venture, and the study subjects were the second cohort of this programme. Student accounts revealed the positive perceptions that the local health-care community had toward harnessing primary care as an educational resource. Study subjects recalled the excitement amongst several HCPs for the LIC initiative and the support extended toward LIC students to ensure that they got a fruitful learning experience: “A lot of people were interested in the clerkship [...] Some people did kind of highlight that it was a better way of learning [...] some people were really enthusiastic about it [...] We did get lots of positive feedback”. (Participant 5)

## Discussion

This qualitative study researched medical students’ perceptions of the role of their recent LIC experience with respect to their future learning and practice. The results confirmed a rich IPL during the LIC year through several contextual factors and generative mechanisms. A superior IPL and development of students’ clinical team working skills have been reported in existing literature (Molwantwa et al., 2019; Walters et al., 2012). The present study illuminates the LIC attributes identified in student transcripts operating in the context of a primary care clinical setup that enriched their experience. According to the study findings, DLIC placements provided IPL that was contextual and of practical relevance; these being some of the key features critical to effective IPL previously highlighted by medical educationalists (Barr & Low, 2013).

Study subjects portrayed the primary care setting as a rich educational context for IPL owing to several opportunities to engage with and learn from a range of HCPs in the workplace. It is apparent from student transcripts that IPL during DLIC involved both cognitive and affective domains demonstrated in the interprofessional respectful attitude amongst professionals in GP teams. Stephens (2015) suggested that an attitudinal effect in relation to interprofessional work is not possible with a one-off interprofessional interaction or educational event. The stance reinforces Allport et al.’s (1954) contact theory implying that development of healthy interprofessional values and behaviors require repeated exposures. The present study offers perspective and context in a longitudinal programme, which can be employed widely to facilitate effective

and purposeful interaction between HCPs to improve inter-professional relationships.

Earlier researchers have commented on interprofessional interactions during work-based learning in primary care placements (Molwantwa et al., 2019; Van Der Zwet et al., 2011). We confirm the development of supportive relationships with various team members during extended LIC placements. The current study adds to the literature by highlighting how the perceived absence of interprofessional hierarchy, with students being treated as equals by GP supervisors and practice staff, appears to be a key generative mechanism positively impacting their learning. Furthermore, it is associated with motivating students to take greater responsibility in patient care. Social interactions, such as students being welcomed in practice lunches, meetings, or extra-curricular visits, provided a holistic view of the various professions to the learners. Roberts et al. (2017) reported that immersion in the community outside the workplace significantly enhanced learning, along with enriching student experience. The current study also emphasizes the value of tacit learning in a relatively less structured DLIC environment, with students having the autonomy to pursue the professionals and activities that they perceived more useful.

The flexibility and autonomy allowed during the LIC year proved to be another generative mechanism resulting in effective IPL for students. However, it may be argued that informal learning spaces in a LIC environment require greater learner agency and engagement (Roberts et al., 2017). Extended clinical placements in the community may contribute to developing these agentic capabilities, which are educational outcomes in their own right (Gupta & Howden, 2021). The present study highlights the value of informal interprofessional education in clinical workplaces, which are underutilized in many healthcare settings (Nisbet et al., 2013).

Health education literature highlights that physicians have the least positive attitude toward interprofessional working and are least engaged in interprofessional educational initiatives in comparison to nurses and other HCPs (Baker et al., 2011; Chang et al., 2009). These findings might be influenced by past experiences or professional identities, culture, and hierarchies (O'Carroll et al., 2016). Hence, if medical students have fruitful and satisfactory interprofessional encounters during their LIC exposure, they are likely to be advocates of interprofessional educational activities in future professional life.

Existing literature also suggests a lack of awareness around what good and effective interprofessional working is within clinical teams, possibly due to absence of exposure to ideal settings (Wittenberg-Lyles et al., 2010). Students in our study however, had the advantage of being in the DLIC setting, which they reported as having authentic interprofessional working with “all HCPs equal in the business of patient care,” and opportunities to observe clinical teams during their final year in the tertiary care hospital, where they witnessed interprofessional hierarchies and divides (illustrated in student quotations above). Thus, we may claim that having been exposed to both the settings, the study subjects' perceptions are likely to be valid.

### **Strengths and limitations**

The strength of the study is that we managed to gain rich insights into the lived interprofessional educational experience of medical students who undertook both the clerkship models sequentially. The longitudinal study design enabled the capture of spontaneous student accounts without prior cognitive processing which was clearly demonstrated in the diary entries. It proved to be a time-efficient process for both the participants as well as the researcher. Triangulation in time allowed consensual validation of IPL-related issues shared in the diaries to be checked with each of the study subjects in the exit interviews.

The study is limited in generalizability due to the small sample size and the individual variations in the DLIC placements undertaken by the study subjects. Students self-selected the DLIC strand in their penultimate year and volunteered to participate in the study during the final year of their course. A positive student bias toward their choices cannot be disregarded.

### **Implications**

The present study findings regarding authentic IPL during LIC placements have significant implications for medical education. Future researchers could draw from the results and investigate whether some of the identified enablers of effective IPL could be imbedded in other clinical teaching environment. For example, “longitudinality” as a contextual factor may be attempted during curricular renewal activities, leading to longer blocks that allow students to “settle in” respective healthcare teams and benefit from extended interprofessional associations. The superior IPL identified in the primary care workplace can be explored further to empower students to seek “learning opportunities” with the wider healthcare team. Longer term studies could investigate if the LIC alumni continue their positive perception of interprofessional working into their professional practice. This is of relevance since there is limited evidence of sustained effect of any interprofessional educational activity in the literature. Future research demonstrating transferability of positive outcomes in actual practice, such as reduction in clinical errors and improvement in patient outcomes would generate evidence in support of LIC-style interventions, given that these are a significant curricular undertaking by any medical school.

### **Conclusions**

This study showed that DLIC provided the students a rich experience of interacting and learning from several HCPs. This paper extends the explanatory understanding of LICs as a rich landscape for IPL, by analyzing the interplay of enabling contextual factors and the generative mechanisms operating in the primary care practice environment. These findings are noteworthy in informing future community-based programmes given the growing zeal toward contextual implementation of LICs in the UK owing to the primary care workforce crisis. The pedagogic contributions of the LIC model reinforce workplace learning and enrich student experience through

positive IPL that prepares them for future collaborative practice.

## Declaration of interest

The authors declare that there is no conflict of interests.

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