Exploring the influence of rural longitudinal multidisciplinary student placements on interprofessional education and collaborative practice in South Africa

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Background. Training health professions students along the continuum of care on the distributed training platform (DTP) is increasingly being adopted by universities across Africa to promote the development of responsive healthcare professionals. Interprofessional collaboration to meet patient needs is an integral part of this ideal. Multidisciplinary student placement on the DTP (MDTP) provides opportunities for interprofessional education (IPE). Stellenbosch University offers longitudinal undergraduate student placement at two rural MDTPs in South Africa.
Objective. The objective of this study was to explore the perceived IPE opportunities in Worcester and Upington in South Africa.
Methods. Sixteen purposively selected undergraduate students from five-degree programmes who trained in Upington or Worcester were individually interviewed in 2022 using a qualitative case study research design. Inductive thematic analysis was conducted in reflection with an independent researcher, after which data were deductively analysed using the definition of IPE to guide data coding and theme development.
Results. The value of curricular IPE activities and the need for co-curricular IPE activities focused on holistic patient care were noted. Extracurricular themes related to purposive co-ordination of accommodation, transport and social activities to promote interprofessional interaction were noted.
Conclusion. It is not always possible to purposively design IPE activities on rural MDTPs owing to financial and human resource constraints. This study offers insight into curricular, co-curricular and extracurricular facilitators for IPE in the design of learning opportunities and logistics on rural MDTPs. Recommendations for the development of future MDTPs are presented.

Afr J Health Professions Educ 2024;16(2b):e1690. https://doi.org/10.7196/AJHPE.2024.v16i2b.1690

Training health professions students along the continuum of care is key to the development of responsive healthcare professionals who can collaborate interprofessionally to meet patient needs in an increasingly complex health care system.[1-3] Distributed training where students train outside academic tertiary level hospitals is increasingly being adopted by universities across Africa for students from all health professions.[2,4,5] This development is driven by pedagogical, social justice and logistical reasons.[6]

A conglomerate of multiple learning sites where students can engage in distributed training away from the academic home requiring accommodation and co-ordinated transport is referred to as a distributed training platform (DTP) for the purposes of this study. The development of a DTP requires logistic and academic co-ordination such as transport, accommodation, student support, co-ordinating learning opportunities and supervision. The complexity thereof is compounded when the DTP is rural and remote in nature. These challenges can in part be overcome by placing students from different degree programmes at the same site for extended periods of time.[7] Multidisciplinary DTPs (MDTPs), where students from two or more disciplines undergo training, provide opportunities for students from different programmes to interact, especially in rural areas where students live and work away from their academic home.[8-10]The potential for interprofessional learning at a MDTP is valuable in meeting recommendations by the World Health Organization to engage in interprofessional education (IPE). IPE takes place when students learn about, with and from each other in order to engage in interprofessional collaborative practice (IPCP) to deliver the highest quality of care across settings.[1-3]Although specifically designed IPE initiatives in rural areas have been shown to be successful,[11] IPE is not inherent in every MDTP, where human resources to initiate and sustain IPE-specific programmes may be limited. Exploring what factors on MDTPs encourage IPE may contribute to the development of sustainable interprofessional learning at remote training sites.

Stellenbosch University offers rural, longitudinal (eight weeks or more), multidisciplinary student placement in Worcester (Western Cape Province) and Upington (Northern Cape Province), South Africa (SA), where students live and train on the same MDTP.[7,12] These sites provide training to final-year undergraduate students in medicine, occupational therapy, physiotherapy and/or speech, language and hearing therapy and human nutrition. The prevalence and perceived value of informal and formal interprofessional learning opportunities at these sites have yet to be explored.

The authors aimed to identify strategies that will enable institutions to plan for and optimise interprofessional learning on rural MDTPs using Khalili *et al.*'s Interprofessional Socialisation (IPS) framework which explores students' engagement in (*i*) breaking down barriers; (*ii*) interprofessional role learning – interprofessional collaboration; and (*iii*) the development of a dual/interprofessional identity.[13] These findings may be valuable in promoting IPE and subsequent IPCP with the emerging number of new rural MDTPs in SA.

Methods

A qualitative multiple case study research design was used to explore student experiences on the MDTP using a social constructivist paradigm. Each participant was considered an individual case bound by year, site and duration of placement at each site.

Sixteen consenting final-year undergraduate students from five professional degree programmes (two students per programme per site) who trained for eight weeks or more in Upington and Worcester in 2022 were purposively selected for this study (Table 1). Students were invited to participate via email (sent via their academic co-ordinators) and WhatsApp in October 2022 and were individually interviewed at the end of their academic year.

Multiple case studies were used as a means of data triangulation to improve the generalisability not of the site or population, but to determine whether the theoretical findings have relevance beyond a particular participant's experience.[14] This was done to identify whether similar causal events within each case (geographical location, profession, duration of placement) produced similar outcomes.[15,16]

Inductive thematic analysis of the data was done by JM using Atlas.ti (Version 23.1).[17] Reflexivity during initial data analysis was done in consultation with JM's PhD supervisors (EA and IC) as well as an independent researcher with no knowledge of the MDTPs.[18] This same independent researcher was purposively from a different demographic and professional background, to assist JM in enhancing the validity of the analysis process by challenging her assumptions.[19] A code book was developed by JM and a second round of analysis was conducted deductively by JM. It is these data that are presented in the present paper.

Findings

During the analysis, it became clear that opportunities for IPE existed during three stages of learning: formal and informal learning opportunities during the clinical placement as well as interactions outside the formal teaching site. The themes and sub-themes constructed from the data are explored below (Table 2).

Formal interprofessional learning opportunities

Collaborative Care Project (CCP)

Formal IPE opportunities in both Worcester and Upington comprised the Collaborative Care Project (CCP), which was a co-ordinated interprofessional weekly group discussion using the International Classification for Function, Disability and Health to guide patient case discussions. This opportunity was facilitated by a clinical supervisor and broadened students' understanding of other professions' roles, as highlighted by P3U.OT:

> Before going to Upington, I didn't have a lot of knowledge on what exactly a physio would do, what exactly a speech therapist or even a doctor.
>
> I think often the medical students were like, oh, we didn't even know you guys can do that. That's a great opportunity to, you know, explaining those things. P8U.PT

An occupational therapist student (OT) from Worcester alluded to the space created by the CCP for a disruption of uni-professional thinking:

> So, CCP was amazing. It really opened my eyes in terms of the importance of each and every person in the health system. Like everyone has a part to play. And how we are driving this forward to get these people out of hospital. P2W.OT

Assumptions were often challenged during these group discussions where some students arrived feeling that they needed to defensively advocate for their profession based on prior experience and role modelling. Instead they experienced a culture of inquiry and inclusivity of professions:

> Our lectures would always say, like, we really need to advocate for ourselves. Cause the doctors doesn't realise what we do, and they overlook us a lot. So, we kind of came into collab care with that mindset. But then seeing here, like how open everybody was and wanted to hear our input, they would pull us into the conversation every time. So that was a very nice experience. P4W.HN

The neutral space created for interprofessional discussion during CCP enabled students to meet and get to know one another which reportedly enabled them to communicate and connect, leading to improved engagement around patient care.

> I think collaborative care … sort of forced me into realising that I can actually connect with them [students from other programmes]. P6W.PT

Table 1. Participants' gender, degree programme, duration of training and placement site

Site 1: Upington	Gender	Approx. duration on platform during 2022	Degree programme
P1U.PT	F	8 weeks	PT*
P2U.OT	F	13 weeks	OT†
P3U.OT	F	13 weeks	OT†
P4U.MBChB	M	Jan - Nov (44 weeks)	MB ChB‡
P5WU.SPT	F	8 weeks	SPT§
P6WU.SPT	M	8 weeks	SPT§
P7U.MBChB	M	5 months (20 weeks)	MB ChB‡
P8U.PT	F	8 weeks	PT*
Site 2: Worcester	**Gender**	**Approx. duration on platform during 2022**	**Degree programme**
P1W.MBChB	F	Jan - Nov (44 weeks)	MB ChB‡
P2W.OT	M	Feb - Nov (40 weeks)	OT†
P3W.HN	F	Jan - Nov (44 weeks)	HN¶
P4W.HN	F	Jan - Nov (44 weeks)	HN¶
P5W.MBChB	F	Jan - Nov (44 weeks)	MB ChB‡
P6W.PT	F	8 weeks	PT*
P7W.OT	F	Feb - Nov (40 weeks)	OT†
P8W.PT	M	8 weeks	PT*

*Physiotherapy
†Occupational therapy
‡Medicine
§Speech, language and hearing therapy
¶Human nutrition
Note: The table includes the codes used to represent participant quotations in the findings.

Table 2. Themes extracted during data analysis

Themes	Sub-themes
1. Formal interprofessional learning opportunities	• Collaborative Care Project • Perceived learning outcome and assessment
2. Informal interprofessional learning opportunities	• Ethos of the training site • Limitations of unstructured opportunities • Formation of relationships • Improved patient care
2. Interprofessional engagement opportunities outside of work	• Accommodation • Transport • Duration of MDTP placement • Social opportunities

> And then as you get to know each other, I would easily go and approach [X] in the hospital and ask a question if I see, for example, we are sharing the same patient. P4W.HN
>
> I don't think holistic patient care would really exist the way I experienced it this year ... Like, doctors wouldn't be able to manage the patient the way the patient should be managed … collaborative care actually provides continuity of care. P9W.MBChB

For many students, CCP was the first opportunity for IPE during their undergraduate training and without the opportunity for interaction, working relationships were frustrating.

> If there's not something like that [interprofessional group discussions], it's very difficult or a bit frustrating to engage. P8U.PT
>
> I haven't come across one [formalised IPE experience] yet, that experience showed me the best that I have seen in terms of like collaborative care and I now know the potential. P5WU.SPT

Perceived learning outcomes and assessment

IPE seemed to have been driven by learning outcomes and assessment requirements across degree programmes at both sites, especially when students were assessed based on their interprofessional management plan:

> I went to the med students and say, listen, I know you need to stabilise this patient, but what do you look for initially? … Then you go to them, and you say, I don't know. P2U.OT
>
> It was always good because they would avail themselves for questions when we were writing our portfolios, we would ask them, so what's the role of a physiotherapist in this case? Or an OT in this case? So we really got to interact with them. P9W.MBChB

This level of inquiry extended beyond just the theoretical and, in some cases, students would accompany other students during their patient management to learn from them.

> She identified my patient as the person who she wants to present ... not knowing what an occupational therapist does, she asked if she could shadow me and see what I do. P3U.OT

Contrary to the students driven by assessment, P4W.HN felt that IPE in Worcester was facilitated by active learning while working as opposed to learning purely for assessment purposes at the academic hospital.

> At [X] it was not the same as here, it was like very little interaction probably because you go in with a mindset almost like this is an assignment … I'm not actually treating this patient, I'm just getting my information. Whereas here it feels more like, I'm working, like this is my job and this is my patient. So, you almost take it more seriously and that's also why we collab a lot more here. P4W.HN

2. Informal interprofessional learning opportunities

Ethos and existing structure of the training site

Students' spontaneous engagement with other professions during their rotations was predominantly driven by the ethos of the clinical staff who ran ongoing multidisciplinary activities, allowing students to work with other professionals:

> The high-risk clinic in Upington, we worked so closely with dietician, with physios, with OTs we even had joint therapy sessions. P5WU.SPT
>
> I worked with social workers a lot and then psychiatry worked with the OT a lot. And then physiotherapists were actually all over the hospital. So we got to interact with them. P9W.MBChB

Limitations of unstructured opportunities

There were students who felt that opportunities to engage in IPE with specific professions outside of CCP were limited because these were not structured into the curriculum even if students were placed at the same site. Challenges such as scheduling of student rotations and shared placements were also raised.

> As P3U.OT put it:
>
> Even though like we would see them [MB ChB students] in the hospitals, and we would be aware of them, we would never have collaborative sessions with them or have discussions with them or ward rounds where we would discuss patients.
>
> Even if you are at the same placement, it's different days. There's not really time to, you know, to sit down and have a chat about this specific patient because your schedule is different [or] you don't have the same patients. P6W.PT

Formation of relationships

Despite the perceived lack of structured or formal IPE opportunities, interactions between students who had previously met were catalysed by them wanting to improve patient care:

> We met them [the physio students] in the hospital, they were doing home visits and we were, like, but can we also come with, please, because this is a therapeutic patient as well ,we could actually really use your help. And they were, like, 'Ja'. P1W.MBChB
>
> In Upington it was quite easy. We had a lot of students' interaction when we had collaborative care meetings so that was quite cool to actually ask the students and say, listen, I'm seeing a so-and-so case right now. Would you mind tagging along and sharing some of your knowledge and experiences with me? P6WU.SPT

Interprofessional interaction was also driven by students realising their professional limitations, so they would reach out to students whom they had not yet met because they wanted to provide the best care for their patients.

> Because sometimes they would be like, okay, I'm struggling to put in an NGT tube. Do you mind coming to help? You're like, okay, cool. Yes, I do need to practice as well, so let's just go put it in. P7U.MBChB

3. Interprofessional engagement opportunities outside of work

Informal opportunities to meet one another and engage socially across professions were influenced by logistics such as living arrangements, sharing transport and the duration of placements.

Accommodation

The interaction between students around improving patient care extended beyond the clinical training site and into informal spaces such as the residence:

> After I did collaborative care, if there's people who were on my team and they were in res, I sometimes went there and we chatted a little bit or you see people working with the patients in the hospital and then it's your patient … and then you see them in res to chat about the patient. P1W.MBChB

Transport

Students felt that transport arrangements to and from clinical sites improved interprofessional interaction:

> Travelling facilitated it, our trips to [clinical sites] just driving with the other med students, having to share the transport sometimes in the

mornings was the way I met a lot of OTs and speech. P4W.HN

I don't think we really met [informally] other than the transport. P8W.PT

Meeting students from other professions by sharing of transport was also reported at the centralised training sites:

[IPE] wasn't significant in my circle in [X], but we would actually interact with people from other disciplines when we all go to church in the bus … if you ask someone, oh, what do you study? I don't ever see you and that person is like, oh, I'm in physio. P9W.MBChB

Duration of MDTP placement

The time students spent living and working on the MDTP influenced students' ability to forge new relationships, work together and improve patient care:

The longer [the placement], the better because it takes like two weeks to just break the ice. Not only get to know fellow students and to build social and personal relationships, but also in a professional capacity to learn about ourselves and to learn together. P8U.PT.

We've had shorter blocks in our previous years and it's difficult to collaborate with different students. It's a lot easier when you get the hang of your environment to reach out and collab with other people. P6WU.SPT

Treatment could have been a lot better if we were able to collaborate with the doctor, like directly ... so I think if you are on a longer block, maybe you get to establish sort of those relationships. P6W.PT

Social engagement

In some cases, having broken the metaphorical ice during CCP, students were more comfortable reaching out to other disciplines to engage with them socially after hours, but overall opportunities to engage socially with students across professions were limited.

In Upington, we didn't really, other than collaborative care have a 'get to know your kind of platform'. P5WU.SPT

I didn't connect socially as much with like, anyone from the medical profession other than the students during, like during collaborative care. P1U.PT

Discussion

Institutions of higher education are pressed to produce health professionals who are fit for purpose, and the evidence is clear that IPE is a crucial step during undergraduate training.[1-3] MDTPs provide a rich opportunity for interprofessional exposure, and understanding the potential that these types of sites have to promote IPE is necessary to inform future MDTP development in Africa.[5,20]

The findings of the present study indicate that students had the opportunity to navigate the three stages of IPS: (*i*) breaking down barriers; (*ii*) interprofessional role learning – interprofessional collaboration; and (*iii*) the development of a dual/interprofessional identity[13] during formal and informal teaching as well as during social engagements. These levels of exposure align with activities of learning that promote graduate employability which are imbedded into undergraduate education, namely curricular, co-curricular and extracurricular which are explored below.[21]

Curricular activities

Curricular activities refers to a formal curriculum where students' learning is structured and tailored and may form part of their assessment.[21] Students reportedly appreciated and benefitted from the limited formalised IPE at both sites, through the CCP especially since this IPE focussed on collaborative patient care driven by the ICF framework. The ICF is considered a facilitator to IPE and IPCP because it provides a shared language,[22,23] which is recommended in promoting IPCP.[24] The facilitation of this learning in a neutral space enabled the 'breaking down barriers' aspect of IPS which is clearly evident during students' active participation in the structured IPE activity offered in both Upington and Worcester. It is in these spaces that students reported putting down their defences and openly learning from and about other professions which enabled spontaneous engagement in other learning and social spaces.

Co-curricular activities

Co-curricular activities are facilitated by the university but fall within services offered by other organisations, e.g. state hospitals,[21] e.g. multidisciplinary ward rounds. Students reported engaging in IPE and IPCP in these spaces when motivated by the existing clinical structures or ethos at the site. Ford *et al.*recommend incorporating IPE elements into normal multidisciplinary clinical activities and this can be done using the ICF; this is supported by Moran *et al.*[24,25] Students' own initiative to engage in IPCP was motivated by complex patient case management, awareness of their professional limitations and driven by perceived learning outcomes and assessment. The development of what Khalili *et al.*term 'interprofessional role learning – collaborative practice' is evident when students actively recognise the need for a team approach and the role they play in that team.[13] The 'dual identity' formation during IPS that Khalili *et al.*speak of when students recognise the value of both professional and interprofessional knowledge, values, beliefs and behaviours that can be used to improve quality of care and services[13,26] is not at the expense of students' uni-professional identity but an expansion thereof to one of being a member of an interprofessional team.[13] This can be seen in the findings when student spontaneously sought input from other professions during the co-curricular activities.

Extra-curricular activities

Extra-curricular activities are external to student training and include opportunities for informal engagement and socialisation outside of the clinical learning space.[21] The Stellenbosch University Teaching and Learning Policy recommends that curriculum and co-curriculum should be intentionally designed and that educators should offer opportunities for the student to grow along social, individual and affective dimensions to consider holistic student success; in other words, considering the extra-curricular influence.[27] Olson notes that IPS is not instructional and depends just as much on social and contextual factors, which was evident in a study exploring rural IPE in Australia.[28] This study highlighted the importance of social factors in promoting IPE, such as shared accommodation, transport and opportunities to meet one another, which is in line with findings from Martin *et al.*[29]

These three categories of learning and teaching activities need to be considered on MDTPs and interwoven into the students' experiences, especially when students are placed far from their usual communities of practice and support systems. Providing opportunities for cross-professional socialisation is just as important as formalised IPE when trying to encourage IPS and collaboration on MDTPs. Martin *et al.*highlight the value of sharing clinical training sites, encouraging safe spaces where hierarchy is challenged and providing shared accommodation, which can promote IPE, especially in rural places.[29]

Recommendations based on the findings that promote alignment of training and IPE are presented for consideration when developing or renewing student learning on MDTPs. These recommendations may afford integration of IPE into existing training opportunities and are made across the three categories of learning and teaching (curricular, co-curricular and extra-curricular) in alignment with Khalili's IPS framework.[13] (Table 3).

Implementing these practical recommendations to promote IPS and IPCP in the workplace may enhance student IPE on MDTPs. Undertaking the development of IPE on MDTPs may be streamlined with the establishment of a rural advisory group inclusive of academic, clinical and community stakeholders which has been shown to be effective in promoting IPE in the Australian-based Rural Interprofessional Education and Supervision (RIPES) model for clinical training.[30]

A limitation of the present study may be interviewing students from only one institution and only two MDTPs; however, this explorative case study was not intended to be generalisable across SA. Using an objective measurement tool to establish the process of IPS such as the Interprofessional Socialisation and Valuing Scale as suggested by King may have provided richer insight into students' IPS.[31]

In hindsight, conducting a deductive analysis of IPE- and IPCP-related codes in the second round of analysis may have resulted in missing important contributing factors mentioned by Olson, such as pre-existing friendships, age, gender, race and distance from campus.[28] These considerations will form the basis of a follow-up publication, explicitly exploring interdependent individual experiences and intrapersonal factors that affect IPE on the MDTP.

Conclusion

Rural MDTPs are becoming more common as different professional degree programmes embrace the value of rural or remote distributed training that is longitudinal in nature. Aside from formally structured IPE opportunities and selecting DTPs with a culture of IPCP for students training, it is evident that interprofessional extracurricular opportunities, context and interaction between students contribute to the development of IPS and should be considered during the planning of activities and logistics on MDTPs. Consciously designing MDTP learning experiences to encourage iterative IPS, which is considered to be an effective process in driving IPCP, is necessary and can be facilitated by implementing strategies proposed in this paper.

Declaration. None.

Acknowledgements. We thank Ms Abigail Dreyer for her assistance with data analysis.

Author contributions. JM designed and conducted this study as part of her PhD degree and developed and drafted the article for publication. EA and IC are both supervisors of JM's PhD and provided critical reflection during the design and implementation of this research as well as during the writing of the article.

Funding. Funding was made possible for this research by the Ukwanda Strategic Rural Research Fund.

Conflicts of interest. None.

Table 3. Curricular, co-curricular and informal extracurricular initiatives to consider on the MDTP to encourage IPS and ultimately the development of IPCP

Initiative	Curricular (formal opportunities)	Co-curricular (informal opportunities during training)	Extracurricular (informal opportunities for engagement)
Breaking down barriers	Formalise platforms for students to meet and engage with students from another profession by aligning student timetables, ensuring students from different professions attend the same sites on the same days. Harness overlapping students' outcomes and assessment such as graduate attributes and patient-centred care as an avenue by which to position teaching and learning activities that promote IPE.	Be cognisant of the interprofessional culture at sites and incorporate it into programme renewal. Seek facilitators who role-model IPCP. Schedule concurrent placement of students at clinical sites to enhance the potential for interprofessional engagement.	Send students to DTPs for longer periods of time. Avoid short rotation student placements. Provide shared transport to and from training sites. Consciously place students from different professions in the same accommodation spaces. Create social engagement opportunities where students can meet and build relationships.
Interprofessional role learning - interprofessional collaboration	Case-based discussion using the International Classification for Function Disability and Health framework (ICF) Make learning outcomes and assessment explicitly linked to interprofessional engagement.	Facilitate or select sites with interprofessional ward rounds or other interprofessional activities that students can be part of during clinical training.	Encourage after-hours interprofessional patient management discussion by allocating patients to groups of students from different professions.
Development of a dual/interprofessional identity	Create spaces and facilitate active reflection on the value of IPE and IPCP in relation to patient-care through structured IPE activities like the CCP. Encourage students to present portfolio patient / case-based assessments with other professions to promote the notion of interprofessional identity.	Introduce ICF -based patient assessment and management plan into the clinical space; this may require running faculty development programmes related to IPE and the ICF to promote IPCP. Focus on patient-centred care.	

IPE = interprofessional education; IPCP = interprofessional collaborative practice; DTP = distributed training platform; ICF = International Classification for Function Disability and Health Framework; CCP = Collaborative Care Project ; IPS = interprofessional socialisation.

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Accepted 27 November 2023.