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A comparative study of decentralised training platforms in undergraduate medical education at four South African universities

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A thesis completed by published work
Submitted to the School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Doctor of Philosophy

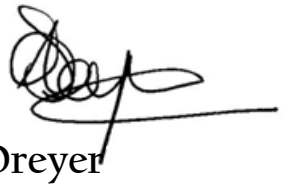
22 April 2025

DECLARATION

This thesis is submitted in the divided block format of published work, approved by the Faculty of Health Sciences.

I, Abigail Ruth Dreyer, declare that this thesis is my original work. It is being submitted for the degree of Doctor of Philosophy in the University of the Witwatersrand, Johannesburg. This thesis has not been submitted before for any degree or examination at this or any other University. I am aware that plagiarism is wrong, and I confirm that this thesis is my own unaided work except where I have explicitly indicated otherwise.

I have read the sections on referencing and plagiarism in the Wits Plagiarism Policy. I have followed the required conventions in referencing the thoughts and ideas of others. I understand that the University of the Witwatersrand may take disciplinary action against me, including suspension or permanent expulsion, if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

Signature: 

Abigail Ruth Dreyer
Date: 22 April 2025

DEDICATION

This poem was written during a reflection exercise at a writing retreat, at the 8th International Symposium on Poetic Inquiry in May 2022 in Cape Town. We were asked to free write on our positionality in our research.

The Mirror of my work

Pitter patter pitter patter…
I don't know where you are from, but where I'm from
The rain, it don't sound like that.
The rain, where I am from, falls with no pattern, no order but with a sound that will deafen you.
I don't know where you are from, but where I'm from
The words, it don't flow like that.
The words, where I am from flows in such a liquid form that it could drown you.
I don't know where you are from, but where I'm from
The thoughts, they don't construct like that.
The thoughts, where I am from are created and form and come together to tell you the story that you have not heard before, a story that will take your breath away.
The same words, they can mean so many things if only you look.
I do know that when I stare, when I glare, when I focus
To examine my work
And attempt that positioned stance.
You too can see what I see.
Instead you choose not to
Instead all you choose to do is the one easy task. Edit/correct
The heavy work that sits heavy on and in my soul
I hold the pen
My grip is firm and yet you, you claim
You need to hold
You dare to say
You own the power but for the love of science
You are the supervisor NOT God
So, for the love of this Science
The maker, the creator, the artist of form
Let my words reign
Let my will be done
Let me hold the power
And if you don't be warned I will take it back
It is mine and as a coloured woman who has not had my cognitive functioning tested
And just because I have been polite enough
And been kind enough
And been patience enough
And been righted enough
And been wronged enough
Enough is enough
I will grab my pen back. I will hold my pen
I will choose what I stare at, what I glare at, what I dare to focus on
Because when I hold the mirror to my work
It is the reflection of me that you should see
Glow
I don't know where you are from, but where I'm from
I know the Goddess, she said
Don't stand in *italics* when you were meant to stand in **BOLD**.

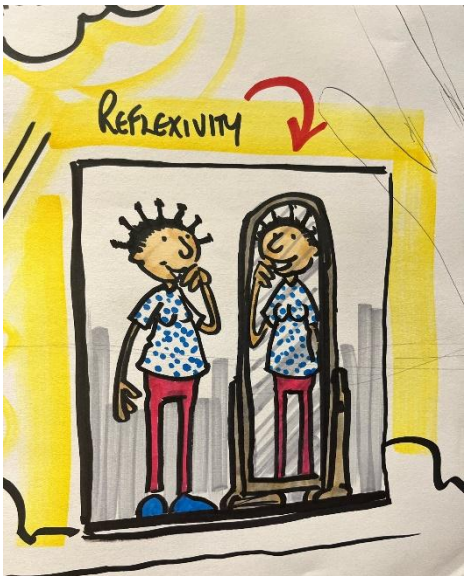


Figure 1: Reflexivity Image generated by Digital Harvestor James Durno at the 8th International Symposium on Poetic Inquiry May 2022

PRESENTATIONS ARISING FROM THIS PHD

1. Dreyer, A.R. Comparative analysis of decentralised training platforms in undergraduate medical education at four South African universities, Interim seminar presentation at the University of the Witwatersrand, School of Public Health, Johannesburg, 7 August 2020.

2. Dreyer, A.R., and Rispel, L.C. Decentralised training platforms used in undergraduate medical education at the University of Witwatersrand. Oral presentation at the University of the Witwatersrand, Faculty of Health Sciences Research Day, Johannesburg, 15 October 2020.

3. Dreyer, A.R., and Rispel, L.C. Context, types, and utilisation of decentralised training platforms in undergraduate medical education at four South African universities. Oral presentation at the 8th Annual Joint Advanced Seminar for the Consortium for Advanced Research Training in Africa conference, held virtually, 23rd and 24th September 2021.

PUBLICATIONS ARISING FROM THIS PHD

Published papers

1. Dreyer, A.R., & Rispel, L.C. (2021). *Context, types, and utilisation of decentralised training platforms in undergraduate medical education at four South African universities: Implications for universal health coverage.* Cogent Education, 8(1). *https://doi.org/10.1080/2331186X.2021.1906493*

2. Dreyer, A.R., & Rispel, L.C. (2022). *Using log diaries to examine the activities of final year medical students at decentralised training platforms of four South African universities.* African Journal of Health Professions Education, 2022;14(2). https://doi.org/10.7196/AJHPE.2022.v14i2.1471

Submitted reviewer comments under review

3. Dreyer, A.R., & Rispel, L.C. *Context, Curriculum and Competencies: Final year undergraduate medical students' experiences at decentralised training platforms.* Discover Education.

Under review

4. Dreyer, A.R., & Rispel, L.C. *The teaching presence of Preceptors in the learning environments at decentralised training platforms.* Frontiers in Medicine *Distributed Training and Rural Health Professions Education.*

ABSTRACT

Background

The World Health Organization (WHO) has underscored the importance of transforming health professional education and their training institutions in order to meet population and health care system needs. The acceleration of "transformative, high-quality education" to ensure that "all health workers have skills that match the health needs of populations" was reiterated by the 2016 Report of the United Nations High-Level Commission on Health Employment and Economic Growth. Decentralised training platforms (DTPs), defined as any learning environment such as a clinic, district hospital or non-governmental organisation used for medical (or health professional) education and training, have been proposed as an important strategy to achieve educational reforms. These DTPs are situated away from the main university campus, exclude tertiary academic hospitals, and are close to and engaged with communities. The benefits of DTPs include the expansion of the teaching platform that enables an increase in the production of medical graduates, attraction to and retention of graduates in rural and other underserved areas, enhanced social accountability of graduates, and changing negative views about PHC or non-tertiary level services.

Aim

The aim of the study is to examine decentralised training platforms (DTPs) utilised in undergraduate medical education by the health science faculties of four South African universities and their role in transforming medical education.

The specific objectives of the research were to:

1. Describe the typology of DTPs at the four selected universities, specifically:
    a. Context or evolution of DTPs at each university
    b. The profile of DTPs (number, type, size, etc.)
    c. Inputs (e.g. staff, finance, infrastructure)
    d. Process of engagement with stakeholders
    e. Envisaged outputs or product of DTPs
2. Compare the teaching or learning objectives at the DTPs
    a. Within each institution's DTPs
    b. Across the four institutions
3. Compare the experiences and perceptions of preceptors and staff at the existing DTPs
4. Explore the medical student experiences at the existing DTPs.

Methodology

Between 2017 and 2020, a cross-sectional mixed methods study was conducted at the University the Witwatersrand (Wits), the University of KwaZulu-Natal (UKZN), Walter Sisulu University (WSU)

and Sefako Makgato University (SMU). These universities represent a wide spectrum of South African universities – from a mainly rural environment (WSU), a mixed environment (UKZN & SMU) to a mainly urban environment (Wits). This PhD study consisted of four components: in-depth interviews with 18 key informants combined with a document analysis; site observations at 8 DTPs; and 13 preceptors and staff, 4 focus group discussions (FGDs) with final year medical students and 60 Log diary analysis. Thematic analysis was used to analyse the qualitative data.

Results

The study highlighted the financial and human resource requirements needed from institutions to sustain the use of DTPs. The teaching objectives emphasise critical competencies like critical thinking, evidence-based practice, clinical application and how DTPs help students understand patients and their backgrounds better. The study revealed the experiences of preceptors and staff at DTPs, highlighting the challenges they face in balancing clinical duties and education. It emphasised the importance of continuous professional development and effective communication for shaping competent healthcare professionals. The study also highlighted the benefits of hands-on patient interaction in developing communication skills and empathy for students trained at DTPs.

Conclusion

The PhD generated new knowledge on the utilisation of decentralised training platforms in undergraduate medical students training. The findings highlight the conceptual and theoretical discourse on DTPs in South Africa and the transformation in medical education.

Keywords:

decentralised training platforms; distributed medical education; health workforce; transformative medical education; South Africa

ACKNOWLEDGEMENTS

During my journey towards earning my PhD, I would like to express my gratitude to a great number of individuals who provided me with support and encouragement.

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The completion of my thesis marks a significant achievement in my academic career, and I owe my parents enormous appreciation for their support. Their sacrifices to ensure my access to education, belief in my potential, and constant love provided the strength I needed to navigate the challenges of this PhD. To them, I dedicate this achievement as a testament to their immeasurable contribution to my life and education. I am the first child in our family to achieve a PhD – it is a privilege and honour I carry with pride.

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ACRONYMS AND ABBREVIATIONS

CIPP	Context, Input, Process and Product
CoI	Community of Inquiry Model
DTP/s	Decentralised Training Platform/s
FGD/s	Focus Group Discussions
HRH	Human Resources for Health
LMICs.	Low and Middle-income countries
MBChB/MBBCh	Bachelor of Medicine and Bachelor of Surgery
NHI	National Health Insurance
NRF	National Research Foundation
PHC	Primary Health Care
PhD	Doctor of Philosophy
TiME-SA	Transformations in Medical Education- South Africa
UG	Undergraduate
UKZN	University of KwaZulu-Natal
SMU	Sefako Makgato University
WSU	Walter Sisulu University
WITS	University of Witwatersrand
UHC	Universal Health Coverage
WHO	World Health Organization

1 CHAPTER 1: BACKGROUND AND CONTEXT

1.1 Introduction

This chapter will give a brief overview of the medical education context, the need for transformations in the curriculum and the reform option of using decentralised training platforms as an alternative learning environment to realise graduate attributes for our health care system. The problem statement, study rationale, study aim and objectives will be outlined. The conceptual framework for the study will be discussed.

1.2 The global context

There is global recognition that investment in the health workforce is essential for improved population health outcomes, the management of international health crises such as Ebola, and for strong and resilient health systems.[1] The World Health Organisation (WHO) has underscored the importance of transforming health professional education and their training institutions to meet population and health system needs.[2] The acceleration of transformative, high-quality education to ensure that all health workers have skills that match the health needs of populations was reiterated by the 2016 Report of the United Nations High-Level Commission on Health Employment and Economic Growth.[1] The six building blocks of such transformative education are: health workforce planning; governance, policy and financing; national standards, regulation, and accreditation; curricula, faculty and education; career and retention; and student selection.[3]

1.3 The South African context

1.3.1 History

In South Africa, various government policy documents such as the National Development Plan, the White Paper on National Health Insurance (NHI),[4] and the five-year strategic plan on human resources for health (HRH)[5] highlight the need to transform health professional education. The transformation imperatives include: increasing the number of health professionals; addressing the maldistribution between urban and rural areas, and between hospitals and primary health care (PHC) facilities; and ensuring that health professional education is socially just and socially accountable.[4-7] Other challenges of health professional education include little or no inter-professional education with negative implications for teamwork in practice; and insufficient emphasis on PHC, particularly in undergraduate medical training.[8-10] Furthermore, the practical training of undergraduate medical students is concentrated in academic, central and regional hospitals. Although this teaching setting

produces medical graduates with excellent clinical skills and knowledge, this environment does not provide the social learning required or the cultural and social competencies to address population health, PHC and/or community-based needs.[11]

Decentralised training platforms (DTPs), defined as any learning environment such as a clinic, district hospital or non-governmental organisation used for medical (or health professional) education and training, have been proposed as an important strategy to achieve educational reforms.[12,13] These DTPs are situated away from the main university campus, exclude tertiary academic hospitals, and are close to and engaged with communities. The benefits of DTPs include the expansion of the teaching platform that enables an increase in the production of medical graduates,[14] attraction to and retention of graduates in rural and other underserved areas,[15] enhanced social accountability of graduates,[16] and changing negative views about PHC or non-tertiary level services.[9,17]

Since the dawn of democracy in 1994, there have been encouraging initiatives at health science faculties in South Africa. These include curriculum reforms, faculty development, and inclusion or expansion of DTPs as part of the teaching platform of medical students.[9] However, there has not been any systematic evaluation or analysis of DTPs, and their current (and potential) role in transforming medical education in South Africa. The exception is a published case study of the Ukwanda Centre for Rural Health established by the University of Stellenbosch in 2002 to train health care professionals with applicable knowledge and hands-on experience of the health issues facing rural and underserved communities.[15] This PhD will generate new knowledge on DTPs in medical education at four South African universities, and their current (and potential) role in transforming medical education. This is critical in light of the current health sector reforms in South Africa,[4] the national calls for higher education transformation spawned by the fees-must-fall campaigns,[18,19] and the global emphasis on transformative health professional education.[1]

1.4 Problem Statement

Decentralised medical training is gaining traction in LMICs. This approach offers students exposure to diverse clinical settings, enhancing their learning and adaptability. It also encourages graduates to practice in underserved areas and aligns with universal health coverage goals. However, implementing decentralised training requires effective leadership, governance, and technology integration.

There is a lack of understanding about the institutional context, types of programs, and utilisation of decentralised training platforms in South Africa. In addition, there are limited studies that have included the experiences and perceptions of preceptors, staff and students at the existing DTPs.

1.5 Study rationale

This PhD study was nested in a broader National Research Foundation (NRF) research programme to explore the transformation of the medical curriculum to meet the needs of the health care system in South Africa. This broader research programme was led by the University of KwaZulu-Natal (UKZN) and was conducted at four different institutions, namely the University of KwaZulu-Natal, Walter Sisulu University, Sefako Makgatho University and the University of Witwatersrand. The four institutions that participated were purposively selected for this PhD study.

The overall research programme identified six thematic areas of research: (1) Attributes and competencies of medical graduates; (2) The balanced exposure to specialists and generalists; (3) Adaptations in the medical curriculum and institutions; (4) Mutual benefit between undergraduates and communities; (5) Application of educational theory in the medical curriculum; and (6) The role of the hidden curriculum in medical education.

My PhD was framed in the thematic area, *adaptations in the medical curriculum and institutions.* I lead the research on the description and analysis of DTPs and their current (and future) role in undergraduate (UG) medical education. DTPs are but one of many adaptations needed in the medical curriculum.

The rationale for my PhD is listed below:

1. This is one of the first comparative assessments or evaluations of DTPs in South Africa. The research will result in the generation of new information on DTPs at the four universities, as well as their position in the transformation of medical education, both currently and in the future.
2. Anecdotal information reveals that the majority of medical graduates prefer working in metropolitan, tertiary, highly specialty institutions and that DTPs are less positively considered by students, academics, and Faculties. So, there is a need for empirical evidence on DTPs and the role that they play or the contribution that they make to the transformation of medical education.
3. The findings of the thesis will be used to design and guide the educational initiatives that will educate and equip recently graduated medical professionals to meet the requirements of South Africa's health and health care system.

4. The doctoral thesis will provide a contribution to the existing body of research about transformational health professional education in South Africa in particular, and in low- and middle-income contexts around the world in general. The research presented in this PhD provides support for the modification of medical curricula and institutions in relation to the utilization of DTPs.
5. The results of the thesis that were acquired will make a major contribution to the discussion that is taking place both locally and internationally about decentralised teaching platforms and teaching innovations.

1.6 Study aim and objectives

The study aims to examine decentralised training platforms (DTPs) utilised in undergraduate medical education by the health science faculties of four South African universities and their role in transforming medical education.

The specific objectives of the research are to:

1. Describe the typology of DTPs at the four selected universities, specifically:
    a. Context or evolution of DTPs at each university
    b. The profile of DTPs (number, type, size, etc.)
    c. Inputs (e.g. staff, finance, infrastructure)
    d. Process of engagement with stakeholders
    e. Envisaged outputs or product of DTPs
2. Compare the teaching or learning objectives at the DTPs
    a. Within each institution's DTPs
    b. Across the four institutions
3. Compare the experiences and perceptions of preceptors and staff at the existing DTPs
4. Explore the medical student experiences at the existing DTPs.

1.7 Structure of the thesis

In Chapter 1 of this thesis, I have provided the background to and context of this PhD study, the global and South African context, concluding with the study aim and objectives and structure of this thesis.

In Chapter 2, I have provided a critical review of the literature.

Chapter 3 is an integrated description of the PhD methodology, including the ethical considerations of educational research.

Chapters 4 to 7 contain the PhD study findings, presented as individual papers:

- Chapter 4: Context, types, and utilisation of decentralised training platforms in undergraduate medical education at four South African universities: Implications for universal health coverage (Published in Cogent Education).
- Chapter 5: Using log diaries to examine the activities of final year medical students at decentralised training platforms of four South African universities (Published in the African Journal for Health Professions Education).
- Chapter 6: Context, Curriculum and Competencies: Final year undergraduate medical students' experiences at decentralised training platforms (Under review of corrections submitted in Discover Education).
- Chapter 7: The teaching presence of Preceptors in the learning environments at decentralised training platforms (Submitted to Frontiers in Medicine).

In Chapter 8, I have presented an integrated and critical discussion of all the elements of the PhD thesis. This chapter also contains the policy implications of the study and the scholarly contribution of my PhD.

In the final Chapter 9, the chapter overall conclusion to the thesis.

1.8 Chapter Conclusion

This chapter has provided an outline of the study. The rationale for the study was also discussed. Chapter 2 will review the literature relating to decentralised training platforms used in undergraduate medical education.

2 CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The aim of this chapter is to summarise the literature relating to decentralised training platforms used in undergraduate medical education. The literature will specifically explore the relationships and integrations for the necessary transformations needed in medical education to strengthen student learning. The enhancement on student learning will translate in the outcome being more competent graduates for the South Africa context. In this chapter, I will explore the different elements of the conceptual framework as they are interrelated and overlap. Each of the elements will be discussed separately for the sake of clarity. This chapter begins with the definition of terms used in the literature presented. From Section 2.3, I will summarise the literature to date on the transformations needed in medical education and then unpack the components of the conceptual framework as they relate to undergraduate medical education. The literature for past 15 years was included in the study as this marks the educational transformation period.

2.2 Definition of terms

Decentralised training platforms (DTPs) is defined for the purposes of this study, as any learning environment such as a clinic, district hospital, school or old age facility, used for medical teaching. This site is situated away from the main campus. The site is situated close to the community the outcomes are aimed to serve and is linked to providing service to that specified community. In so, doing ensuring that specific learning outcomes in the curriculum are met for example primary health care. My definition excludes tertiary academic hospitals. DTP discourse has changed over the past few years and includes and refers to distributed medical education.

Primary health care (PHC) is a whole-of-society approach to health and well-being centred on the needs and preferences of individuals, families and communities. It addresses the broader determinants of health and focuses on the comprehensive and interrelated aspects of physical, mental and social health and wellbeing.[1]

Medical Education according to Garcia (2014) is, "*medical education is the process for training doctors, subordinate to the dominant economic and social structures in societies in which it takes place*".[2]

Community-based Education (CBE) is a form of instruction where students learn professional competencies in a community setting to help students build a sense of connection with their

communities. CBE is a popular approach for all forms of education and for all age groups especially at higher education level where the primary purpose is to foster interdependence between education and communities for enhancing the capacity of individuals and groups for improving their quality of life. Community-based Learning (CBL) is viewed as a teaching methodology that "it is a pedagogical model that connects classroom-based work with meaningful community involvement and exchange".[3]

2.3 Current context of Primary Health Care in Medical Education

The health context in our country requires a strong primary health care focus. Sub-Saharan African countries continue to face challenges with regard to general population health improvement, health systems strengthening and the education of health professionals.[4-6]

Subsequently, the focus has now shifted towards strengthening primary health care and community-based health services. For medical schools in South Africa, responsible for training health professionals, this has meant they have been challenged to produce greater numbers of graduates who will be trained to deliver this healthcare service.
For this reason, medical education in South Africa is facing a major paradigm shift. The urgency to increase the number of suitable, qualified and socially accountable health sciences graduates has brought to the fore the need to identify alternative training platforms and learning environments, often in rural areas.

The primary health care (PHC) approach and the primary level of care are related concepts in healthcare, but they are distinct in their meaning and application.

The Primary Health Care Approach (PHC) is a healthcare philosophy based on equity, accessibility, community participation, and collaboration. It emphasises holistic care, addressing broader health determinants, rather than disease treatment. Rooted in the Alma-Ata Declaration, it aims for "health for all" by ensuring universal health coverage and addressing social and economic inequalities. The PHC approach guides healthcare policies and strategies at all levels to meet community needs.

The primary level of care is the first point of contact with the healthcare system, providing basic services. It focuses on community delivery, typically including general practitioners, family physicians, community health workers, and clinics. Services offered include health promotion, disease prevention, early diagnosis, common illness treatment, and chronic condition

management. The primary level of care is operational and context-specific, determined by available infrastructure and resources.

PHC Approach is a guiding philosophy that underpins how health systems are structured and services are delivered to promote equity and community-centered care. Primary Level of Care is the operational implementation of care delivery at the grassroots level, where healthcare services are accessed by individuals. While the PHC approach influences the design and vision of health systems, the primary level of care is one component within this broader framework, emphasising localised service delivery.

In order for educators to train graduates for the 21st Century, we need to be aware of the ways in which we will measure our shifts. According to the World Health Organisation, more professional health workers are needed, but it has become clear that efforts to scale up health professionals' education must not only increase the quantity of health workers but also address issues of quality and relevance in order to address population health needs.[7]

Our current context requires a more directed approach toward primary health care. Irlam et al.(2009) provide a useful framework for future monitoring and evaluation of the primary health care sub-themes of culture, psyche and illness; health promotion; and evidence-based practice within the medical curriculum.[8]

Although this is seen as a tangible contribution to transformative health professional education, it contradicts the expressions of Duvivier et al.(2015)[9] The authors,[9] and Kent et al. (2007)[10] speak of the interesting developments in how we have traditionally trained undergraduates that offer promise for the future of healthcare and delivery.

More than 100 years ago Flexner proposed reorientation and reorganisation of medical education after a survey of 155 existing medical schools in USA and Canada amid widespread concern about performance and competency.[11] Literature critiques that very little if anything has been done to realise the proposals presented by Flexner (1912)[11]. Gibbs (2007) argues that as an international community that is seemingly passionate about medical education and shares a belief that the future of a country's health relies on the education of its future health care workers we have to recognise the problems faced in medical education.[12]

Recognising these problems and investing in addressing change it is evident that a paradigm[13] shift, both in speech and practice, needs to take place. A shift that embeds improvement in community health with innovations in health professions education with delivery and health policy needs to be at the core of the work at medical institutions.[14]

2.4 Call for transformations in Medical Education

The WHO has recommended that health professional education and training institutions should transform student selection, curricula and educational pathways to meet the health-care needs of communities.[7] Existing evidence suggests that the incorporation of decentralised training platforms (DTPs) and more situated learning within the curricula is an important educational strategy to achieve curriculum transformation.[3, 10, 15-17] Decentralised placements create space for students to build self-confidence and develop competencies that assist in preparing them for practice.

There is a need to transform medical education through the development of relevant skills and competencies that are able to address patient and community needs.[18] The literature indicates that increasing attention is being paid to the need relevant to their contexts and to strengthen health systems.[7, 19] There are constraints in South African medical training that limit academic institutions from meeting the needs of the country.[20] These constraints include the diversity and inequitable divides that exists in the communities in South Africa. The challenges are systemic and the absolute number of graduates that are produced per annum is not enough to respond to the country's needs. Another challenge that exists is that medical schools are centred around large tertiary hospitals in the cities.[21]

This has implications in the design of rotation settings, rotation objectives, the activities students are expected to complete and the environment where the learning takes place. Worley et al.[22] speak of the split between the learning that is meant to take place and what is actually learnt whilst out on rotations. Context-based learning reflects consideration for "the interaction and intersection of students, learning tools, and context is given a learning environment" (23, pg. 44).[23] A deeper understanding of the factors that impact on learning can assist educators to optimise the teaching and learning environment. The concept of social context suggests that "learning is an everyday event that is social in nature because it occurs with other people, and it is the interaction with the setting itself that determines the learning" (24,pg 13).[24] This will

ensure that graduates are fit for purpose and meet the required competencies for our context of professional engagement in South Africa.[25]

Students who undertake a placement in communities are able to participate in the comprehensive care of patients over time; participate in continuing learning relationships with these patients' clinicians and the community, and meet the majority of the year's core clinical competencies, across multiple disciplines simultaneously through these experiences.[26]

2.5 Methodologies used in medical education.

Teaching methodologies have changed in undergraduate training. Most of the learning no longer takes place in the classroom. Dated teaching technologies like bedside teaching, problem-based learning and simulation continue to form a huge part of the teaching methodologies used. It is clear that changes in medical education have begun to ensure learning is carried out with some context-based activity in a social setting.[27] However, there is still tension between those who argue for the importance of the cognitive learning[28] of students and others who believe that learning is largely a sociocultural phenomenon.[29]

The utilisation of this platform in the teaching process at the university will impart skills and knowledge to be a medical expert. David Gruenewald, speaks of how "place-based pedagogies are needed so that the education of citizens might have some direct bearing on the well-being of the social and ecological places people actually inhabit" (30,pg 4)[30]

Englander et al[31] and Reeves et al[32] support the notion that within the training there is need to develop more competencies that can be best developed in community contexts with structured learning activities at these decentralised teaching platforms. De Villiers et al. propose that "decentralised training offers opportunities to address this quantity, quality and relevance factors".[33]

2.5.1 Learning spaces

Widyandana et al. (2011) showed that primary health care (PHC) is recommended by medical students as the best place to learn clinical skills,[34] whilst it was also found that District General Hospitals (DGH) were more preferred than tertiary hospitals.[35] The high preference of the DGH by students and the teaching staff is due to its ability to provide longer patient exposure, which leads to improvement in patient care.[26, 36] Daly et al. (2013) highlighted the learning

spaces that occur within rural placements, such as learning about personal roles, experience environment and the connection between students and learning spaces.[26]

DTPs are vital for the education and development of health professionals like physiotherapy and dentistry.[37] They offer interdisciplinary research, practical placements, and professional development opportunities, enhancing students' competencies and preparing them for diverse roles in healthcare systems. DTPs emphasise collaborative learning, fostering a broader understanding of healthcare challenges and encouraging innovative solutions. They align curricula with evidence-based practice frameworks, ensuring students acquire competencies for clinical settings. Learning outcomes are structured around key domains like professional practice, patient care, and sustainable healthcare. Decentralised training platforms further enhance learning outcomes by immersing students in real-world healthcare environments.

2.5.2 Rural Learning contexts

The training of rural workforce is a viable strategy for addressing medical education transformation. Murray et al.(2012) recommended policy interventions that address rural medical workforce needs such as funding provision for rural scholarships purposes, the creation of "rural clinical school campuses and regionally based medical schools", encouraging the selection of students from rural areas, and the establishment of "rural-health clubs" at universities for students to create interest in rural health.[16] This provides a feasible strategy to address the need to train for rural contexts. Limited research speaks to the use of this model as a strategy to address the shortages of staff in underserved areas.

The danger in only focusing on the clinical training of undergraduates limits the community engagement opportunities. In the training of students Bicket et al. (2010) found that motivators for students' engagement were linked to their need to contribute to the community.[38] It empowered students to have responsibility and clearly defined roles, allowing them to have a meaningful connection with others.[38] Training on a rural platform provided students with an understanding of healthcare and how it is delivered in the community.[39] A study on students' experiences of innovative rural education found benefits of rural clinical schools came about because they contribute to the development of leadership qualities and that students acknowledged their role as a healer when they work with patients.[40] Community-based education has been found to have a great impact on communities and student engagement in community work. Short-term benefits included improvement of services, decreased referrals,

home visits; provision of primary healthcare services that are community oriented, communication improvement and professionalism.[41-45] Long-term benefits included improved teaching and familiarity with health care system and student engagement in community work.[3, 41, 45]

2.5.3 Longitudinal integrated clerkships

Hirsh et al.(2012)[46] argue that longitudinal integrated clinical education programmes pay attention to the changing context and have principles that impact and underpin the educational design, the structure of the models, and outcome data for educational reform.

Greenhill and Poncelet (2013) argue that medical education programmes that incorporate LICs aim to create doctors who are patient-centred, clinically competent and knowledgeable, and maintain high standards of professionalism and humanistic values such as integrity and humility.[47] Longitudinal placements allow time to reflect on health issues in a social context and enable students to follow up patients and their families. They provide opportunities for reflection and guidance from clinical teachers, preceptors and peers.

The responsibility to make the most of available opportunities requires that students have the skills to make this link. In order to transform medical education at decentralised training platforms, educators need to better understand what learning occurs for students during the situated learning experiences. The work of van Schalkwyk et al.(2014)[48] and Couper et al.(2011)[49] argue in support of longitudinal placements to enhance the learning opportunities. These findings can provide guidance in designing service-learning activities. Their findings, however, did not explore what these learning environments looked like or how they are constructed. The learning objectives must be aligned with the learning that takes place in that environment. Soemantri et al.(2010)[50] discuss the merits of having clear objectives for the educational environment. It is understood that a well-developed placement at a decentralised training platform will enable graduates to meet the many challenges of providing high-quality patient-centered care and of navigating a complex health care delivery system with the required competencies. This concurs with the competency training that Reeves et al.(2009)[32] and Englander et al.(2005)[31] propose for graduates.

The International Consortium of Longitudinal Integrated Clerkships (LICs) definition states that students who undertake an LIC will participate in the comprehensive care of patients over

time; participate in continuing learning relationships with these patients' clinicians and the community, and meet the majority of the year's core clinical competencies, across multiple disciplines simultaneously through these experiences.[26] The key features of LICs include continuity with clinical teachers, patients and settings[26] introduce a theoretical approach to LICs: the social learning system (or workplace learning). Community-based education and LICs have been in use in South African medical education and building on this in an appreciative way will be the entry into exploring the decentralised training platforms.

The framework used in this study is promising, but there is a broader range of theoretical concepts that underpin the use of the LIC as a new approach in medical education, including the symbiotic model of clinical education, social learning theory and transformative learning.

2.6 Arguments in favour of the use of DTPs

DTPs have been proposed as an important strategy to achieve educational reforms.[51,52] These DTPs have situated away from the main university campus, exclude tertiary academic hospitals, and are close to and engaged with communities.

The benefits of DTPs include the expansion of the teaching platform that enables an increase in the production of medical graduates,[53] attraction to and retention of graduates in rural and other underserved areas,[54] enhanced social accountability of graduates,[20] and changing negative views about PHC or non-tertiary level services.[55,56]

Transformative learning acknowledges the importance of context, relationship formation between students and society, and experiential learning.[57] As such, transformative learning can occur by indulging in community activities that will positively affect the health of the population.[58] Rudolf et al.(2014) emphasized the value of planning student activities with the communities where students are involved in service learning.[59] Transformative health professional education needs many reforms, of which DTPs is only one alternative.[60]

In the preceding decade, the notion of social accountability has assumed increasing global importance. Boelen and Woollard (2009) proposed that social responsibility involves "accountability to society for actions intended to serve it"(61, pg 887) and that within health professions education institutions should foster commitment from graduates to respond to the priority health needs of citizens and society.[61] It is argued that placement of students within

communities for their practical learning experiences, allows opportunities for accountability by students (and future graduates) to these communities.[51] Social accountability supports the idea that learning environments are required to move from tertiary academic teaching hospitals,[62] and that DTPs are more likely to encourage trained health professionals to remain in underserved areas.[63]

2.7 Research Gap for the Study

Empirical gaps exist as to whether DTPs are appropriate training environments to equip undergraduate medical students with the knowledge, skills and attitudes to address the primary health care needs. There have been increasing calls for curriculum transformation, as well as a particular emphasis on the utilisation of decentralised training platforms (DTPs) in our medical schools. The Health Professions Council of South Africa (HPCSA),[64] dictates that it is important for medical schools to deliver undergraduate medical education through decentralised platforms as a method of teaching to better prepare graduates to address the health and healthcare system needs of South Africa. The recent adoption of the Consensus Statement on Decentralised Training in the Health Professions was endorsed at the closing ceremony of the 2017 South African Association of Health Educationalists (SAAHE) national conference in Potchefstroom. The consensus statement positions decentralised training as being part of the solution to the challenges we face in healthcare, and calls on all those involved – particularly education and service partners – to work together towards developing a shared vision for such training.[33] It is part of a process that includes the development of a framework that will provide practical guidance for implementing decentralised training. SAAHE members were invited to support the statement and to use it in advocating for decentralised training.[65]

Existing studies in the field have been limited in the providing the evidence that our curriculum prepares graduates to understand community health needs. Frenk et al.(2010) have recommended a "system-based" educational reform that will address the health system need (such as shortage of medical workforce) and also enables the production of competent students who will be able to address context-specific health challenges.[31, 66,67] Frenk et al. (2010) have argued that transformative learning and mutual dependence in medical education are necessary[5]. Having opportunities for service learning and incorporating the key principles of the PHC approach into a decentralised teaching environment provide the transformative learning that is required.[8, 68, 69] To date, the medical schools in South Africa have not documented the ways in which they currently use DTPs. Anecdotal evidence exists of the DTPs

as examples of transformative learning environments but very little is documented in order for educators to analyse what elements are needed to ensure that DTPs are a transformative learning environment that acknowledges the importance of context, relationship formation between students and society, and experiential learning.[57,70] As such, transformative learning can occur by indulging in community activities that will positively affect the health of the population.[58] Rudolf et al.(2014) emphasised the value of planning student activities with the communities where students are involved in service learning.[59]

It is important to develop context-specific competencies as a way of promoting social accountability. Transformative learning in medical schools cannot be separated from social accountability and a community consultative process is important for assessing the rural training of health professionals.[71] Having a social accountability mandate for the institution provides opportunities for community engagement that strategically contribute to the successful learning experiences of students at rural clinical schools.[72] Emphasis is placed on the need for capacitating educators to be change agents by encouraging peer mentoring, supporting innovations and providing educational scholarships[72, 73] that are based on the self-directed learning[74] approaches of undergraduates. Peer mentoring is necessary for augmenting learning and fostering leadership among students.[75] The literature has a limitation in expression how these models are replicated and what elements are essential to maintaining the learning environments.[76-78]

Medical schools are thus seen as critical change agents to transform medical education by promoting social accountability.[59] For this reason, the responsibility lies with medical schools to develop and propose solutions to address the gaps. Although there are clear gaps with regard to graduate competencies and meeting health system needs, medical schools are considered critical in transforming medical education by supporting a shift away from tertiary education towards DTPs.[16] This will provide more context-based learning that will help graduates develop the necessary competencies for their future practice in delivering healthcare.[79] Studies have been conducted showing how DTPs have been used as an approach to train a greater number of suitably trained health professionals who are more likely to remain in the underserved health sector[16]. DTPs allow for an understanding of the context and local needs in which learning occurs, which in turn assists in addressing relevant competencies.[63] Through decentralised platforms, culture and community are strengthened and social responsibility is encouraged whereby students are involved in community-based projects and service learning activities

leading to context understanding and better service.[51] The curriculum is used to support and assess the graduate's competencies on exit.[67] The curriculum also sets the standard for supervision/ preceptorship while at the DTP.[79] Thus if DTPs have the potential to realise the abovementioned possibilities in undergraduate medical education, why are we not using more platform of this kind?

Like many other countries, South Africa is facing a paradigm shift regarding identifying suitable training platforms and learning environments for medical education that would produce a more suitable graduate. Health personnel will be regarded as being "fit for practice"[4] and socially accountable[80], if they are able to address the[81] health needs of the communities they serve. The focus for medical education is thus shifting towards strengthening primary health care and community-based health services.[10] In particular, Kent and De Villiers(2007)[10] accentuated the importance of medical education that produces health professionals ready to practice in rural and remote areas, and there has been a move towards this in the country.

Another gap exists around whether DTPs can assist in the expansion of undergraduate numbers at institutions. In addition, there is a skewed distribution of health care professionals, as most favour placement in urban-based health facilities for a range of personal and professional reasons.[82, 83] It is within our rural areas that healthcare professionals are most needed. The need to train more graduates is reinforced as basic healthcare services become a mandatory prerequisite for citizens.[84] In order to train more graduates, we need additional teaching and learning environments.

The guidance of learning theories to unpin the teaching at DTPs is another gap in research. As educators, we have underestimated the learning processes for students. As we explore how best to improve higher education in South Africa, we seek answers to questions that have not been explored with such depth. In our attempt to provide transformative education, we need to further understand whether students make meaning" out of these experiences, how students construct knowledge in a clinical experiential setting and what factors will enhance that outcome.[70] Hussain (2011) argues that competency frameworks in undergraduate medical education "increase the transparency, accountability and efficiency of training programmes in the face of a changing healthcare environment"(85, pg 184).[85] The clinical rotation or placement often takes place within a social practice, which presents both opportunities and challenges for students during the learning process.

The work of Wegner,(2011 &2008)[86] outlines communities of practice central to representing an informal or organised learning community or space in which members have three objectives.[86, 87]

1. interact with each other in many ways, which Wenger refers to as mutual engagement
2. have a common purpose, referred to as a joint enterprise and
3. develop a shared understanding of common resources of language, styles and routines by means of which they express their identities as members of the group.

Social learning allows students to gain the attitudes, values, skills, and constructed professional knowledge necessary for effective, responsive practice. Since clinical rotations occur in a practice setting that is largely a social environment, it may be useful to research such a setting by making use of a lens that is socially based such as situated learning.

2.8 Chapter Conclusion

There is a wide variety of options for DTPs, and medical schools choose amongst these in relation to context, aims and resources. It is apparent however that many of the most effective DTP models are situated in rural contexts[88] and that rural medical educators are responsible for a significant proportion of the available literature on DTPs.[89] A competency-based approach to education could result in better quality because educators would begin to have information on outcomes, which could ultimately lead to better patient care.[90] Defining a core set of competencies across educational oversight processes could also reduce costs as a result of better communication and coordination, with processes being streamlined and redundancies reduced.[91] Integrating core competencies into oversight processes would likely provide the impetus for faculty development, curricular reform, and leadership activities.[92]

This may be both because the rural context provides a unique opportunity for hands-on clinical practice and engagement with communities, and because rural academics have often taken the lead in clinical educational innovation.[32] These DTP models show the impact that decentralised training has on students through community health service provision[93,27]; the extent of the impact of this training on the communities served is less documented, and would be a valuable avenue for further research.

It is clear that DTPs have demonstrated the capacity for realising academic, service and social learning agendas, depending on the strategies adopted. Various models of DTPs provide options

for developing context-specific competencies that respond to the health needs of the population. Hunt et al.(2011) also argues that partnerships between communities and academic institutions are essential[94] for the success of a functional DTP model in the 21st century.

3 CHAPTER 3: METHODOLOGY

3.1 Introduction

In this chapter I provide a full method description used in the PhD to achieve the study objectives. In section 3.2, I outline a broader methodology description and the theoretical framework for the study including the timeframes within which the PhD was completed. This chapter starts with the setting, followed by the research design, axiological and philosophical assumptions, as well as a research framework. This chapter will also describe the justification for the research design, recruitment, and participant selection, as well as the tools used for each objective. Likewise, it describes the research process in detail and provides an opportunity to reflect on the research process and methods.

In section 3.3 the ethical considerations are discussed. In sections 3.4 to 3.8, I summarise the study setting, the study population, sampling methods, development of data collection tools, data collection, data management and data analysis. In section 3.9, I outline the triangulation methods, and in Section 3.10, I discuss the study limitations and the steps taken to prevent or overcome these. In the concluding section 3.11, I highlight the strengths of my PhD study.

3.2 Conceptual framework

3.2.1 Brief overview of the frameworks

In this PhD study, I have adapted an analytical framework that draws both on the work of early pragmatist philosophers C.S. Peirce and John Dewey, the Community of Inquiry[95] Model (CoI) and the Context, Input, Process and Product (CIPP)[96] evaluation model, developed by Daniel Stufflebeam and colleagues in the 1960s. CIPP is an evaluation model that requires the evaluation of context, input, process, and product in judging a programme's value.

Recognition for the International Classification of Functioning, Disability and Health (ICF) as a comprehensive framework for understanding health and disability, emphasising the importance of considering the broader context of an individual's life. It advocates for a holistic view of health, recognising that health outcomes are influenced by biological, psychological, social, and environmental factors. The ICF supports ongoing engagement with patients to understand their evolving circumstances, allowing healthcare providers to tailor interventions. It also emphasises the importance of understanding the patient's lived experience and the impact of their environment on their health, fostering a deeper connection between healthcare providers and patients. The ICF framework was not included as a framework in application to this study.

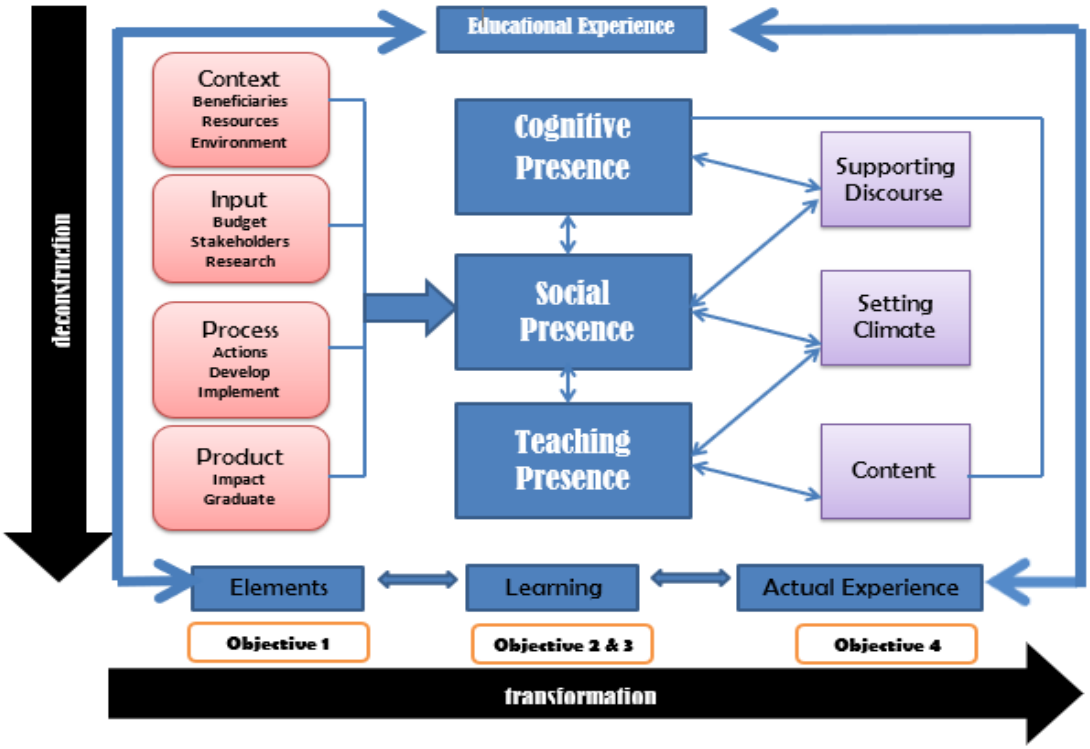


Figure 3: Conceptual Framework developed from the Community of Inquiry (CoI) [58] model by C.S. Peirce and John Dewey, and the Context, Input, Process and Product (CIPP)[59] evaluation model by Daniel Stufflebeam et al.

The CoI model is based on social constructivist education theory, and serves as a framework for teaching and learning.[97] The CoI identifies and measures three essential elements of an educational experience: cognitive presence; social presence; and teaching presence.[97] As DTPs provide the platform for teaching and learning, the CoI provides a useful approach to analysing the educational experience of medical students at the study sites.

The CIPP framework was developed originally as a means of linking evaluation with programme decision-making. It aims to provide an analytic and rational basis for programme decision-making, based on a cycle of planning, structuring, implementing and reviewing and revising decisions, each examined through a different aspect of evaluation –context, input, process, and product evaluation. The CIPP evaluation model is considered a useful framework to guide the conception, design, implementation, and assessment of DTPs, and to provide feedback and judgment of their effectiveness, thus generating recommendations for continuous improvement.[98]

The COI (Community of Inquiry) and CIPP (Context, Input, Process, Product) frameworks complement each other by addressing different yet interconnected aspects of evaluation and learning environments.

- COI Framework: This focuses on creating a collaborative and meaningful learning experience. It emphasises three core elements: cognitive presence (critical thinking and knowledge construction), social presence (interaction and communication), and teaching presence (design and facilitation of learning).
- CIPP Framework: This is an evaluation model that provides a systematic approach to assess programs or projects. It examines four components: context (needs and goals), input (resources and strategies), process (implementation), and product (outcomes and impacts).

Together, these frameworks can be used to design, implement, and evaluate educational programs or learning environments.

3.2.2 Description of my conceptual framework

While the CIPP evaluation model looks at the context, the inputs, processes and products, the COI model look at the experience. For the purposes of this study, the product will not be explored as these benefits / expected outputs require longitudinal studies, and graduate tracking is not an objective of this study.

The learning objectives at the DTPs within each institution may be different across the sites. The supporting discourse, setting climate and content will differ across the four institutions. The interplay of the constructs may differ across the universities and this, in turn, will impact on the transformative opportunities of DTPs.

3.3 Study setting

The study was conducted at the University the Witwatersrand (Wits), the University of KwaZulu-Natal (UKZN), Walter Sisulu University (WSU) and Sefako Makgato University (SMU). These universities are located in three South African provinces and represent a wide spectrum of South African universities – from a predominantly rural environment (WSU), a mixed environment (UKZN & SMU) to a predominantly urban environment (Wits). All four institutions participated in the NRF TiME-SA funded study. Table 1 provides a high-level overview of the selected universities.

3.3.1 Table 1: Overview of selected universities

University	Year of establishment	Provincial location	Target student population	Urban/rural

University of KwaZulu-Natal (UKZN)	UKZN was established in **2004** as a merger of University of Natal (UN) and University of Durban-Westville (UDW). UN was established in 1910 and UDW was granted University status in 1972	KwaZulu-Natal	In 2015, student demographics were reported: 69% Black African students, 24% Indian students, and 5% white students.	Urban (Durban)
University of the Witwatersrand (Wits)	Wits was founded in 1896 as the South African School of Mines but was granted University status in **1922**	Gauteng	From a 2015 report: 60% Black African, 22% White, 13% Indian, 4% coloured students. 55% of students were female	Urban (Johannesburg)
Walter Sisulu University (WSU)	WSU was established in **2005** from a merger between Border Technikon, Eastern Cape Technikon (est. 1985) and University of Transkei (founded 1976 as a branch of University of Fort Hare, and gained independence in 1977)	Eastern Cape	From a 2011 database, WSU is said to have a 100% black African student population, with 57% of the students being female	Rural (Mthatha)
Sefako Makgatho Health Sciences University (SMU)	Established in **2015,** the Medical University of South Africa (MEDUNSA) was separated from the University of Limpopo (established in 2005 by merger) in 2015	Gauteng	20% of students places are reserved for students from the foundation programme, the remaining places are distributed: 78% Black African, 11% White, 8% coloured, 3% Indian.	Urban, (Pretoria North)

3.4 Study design

This study was a cross-sectional study, using mixed methods.[62] A convergent parallel mixed methods design[63] was used to bring together the qualitative and quantitative components. This involved separate collection of qualitative and qualitative data which was merged during the analysis and interpretation phase.[64] Within educational research, a mixed method approach assists with analysing a research problem holistically,[65] as neither quantitative nor qualitative methods are sufficient by themselves to understand the complex processes of teaching and learning that occur during clinical placements.[66,67] Medical education research aims to improve teaching, learning, and evaluation methods in medical schools and training programmes. Furthermore, exploring the educational value ensured that this research contributes meaningfully to educational practice, examining relevant medical education inquiries and distributing findings to positively impact the wider population.

3.4.1 Table 2: Overview of study methods

Objective	Proposed Questions	Data Collection Instruments	Methods of Analysis
1. Describe the typology of decentralised training platforms at the four universities	a. Type of facility b. Number of facilities c. Distance to sites (calculated with Maps) d. Category of health professional students trained e. Length of students stay at facility f. Staff composition and responsibilities g. Relationships with community (communities) h. Innovations/good practices at the decentralised training platform i. Challenges/ constraints at DTPs	a. Site visit and observations b. Interviews with key informants at each of the selected universities' health science faculties c. Faculty documents d. Staff who set up community placements e. Staff who co-ordinate community/service learning activities.	Qualitative analysis: thematic analysis & MAXQDA version 12 MAXQDA 2024 Quantitative data –STATA
2. Compare the teaching or learning objectives at the DTPs within each institution's DTPs across the four institutions	a. What theory of teaching and learning exists at the decentralised training platforms? b. What are the learning objectives as per curriculum? c. What learning activities are outlined in the curriculum? d. What learning activities do students engage in?	a. Document review b. Interviews with key informants c. Interviews with staff and preceptors	Thematic content analysis
3. Compare the experiences and perceptions of preceptors and staff at the existing decentralised training platforms	a. What are the advantages/strengths of decentralised training platforms? b. What barriers/ constraints exist at decentralised training platforms? c. What are the opportunities provided by DTPs to transform medical education?	a. Interviews with staff and preceptors	Qualitative analysis: thematic analysis & MAXQDA version 12 MAXQDA 2024
4. Describe the final year student experiences at the existing decentralised training platforms	a. What are the student experiences from placement at decentralised training platforms? b. What are perceived advantages/strengths of the placement at decentralised training platforms? c. What were barriers? d. What are recommendations from students' perspectives?	a. Focus group interviews b. Log diary	Qualitative analysis: thematic analysis & MAXQDA version 12 MAXQDA 2024

3.5 Qualitative component of the PhD study

The purpose of the qualitative component was threefold: Firstly, using a review of key curriculum documents, and exploring the perspectives of key informants on the training of undergraduate medical students (Chapter 4). Secondly, exploring the perspectives of

preceptors and staff on the utilisation of decentralised training sites on the training of undergraduate medical students (Chapter 7). Thirdly, the experiences of students who are trained at decentralised training sites (Chapter 6).

3.5.1 Key informant interviews and document review

The key informant interviews and the document review was used to answer thesis objective 1 and objective 2. Further details are contained in Chapter 4.

3.5.2 Site visit observation

The data collected during site observations at the decentralised sites was integrated into the findings to answer thesis objective 1 and objective 2. Further details are contained in Chapter 4.

3.5.3 Data management of the qualitative study

Throughout this thesis, all qualitative data was safely maintained. Using a Voice Memos programme on a protected mobile device, the key informant interviews were digitally recorded. The mobile device provided two levels of security: key code and fingerprint access. The audio files were downloaded and saved on a password-protected laptop after the interviews. Likewise, the same password-protected device was used to safeguard the transcriptions of the audio recordings done by researcher. The related notes from the key informant interviews were kept in a secured, access-controlled office. Every handwritten field note from the ethnographic observations that was used to study the participants, cultures, and behaviors in their natural setting was kept in a locked, access-controlled office before being transferred to a password-protected laptop and grid-formatted in Microsoft Excel. The goal was to deeply understand the lived experiences, values, and practices of participants through immersive observation and interaction. Ethnographic methods prioritise context and subjective experiences, making it a powerful tool to uncover rich, detailed insights.

To ensure the credibility and reliability of ethnographic findings triangulation using multiple data sources (e.g., interviews, field notes and documents) and the perspectives helped validate the findings and provided a holistic understanding. The researcher continuously reflected on their biases, assumptions, and influence on the research process, ensuring they maintained objectivity and authenticity in their approach.

3.5.4 Trustworthiness

The standards for assessing the calibre of qualitative research are laid out in Lincoln and Guba's[99] work, which suggests that the results may be used to the creation of curricula and instructional strategies. In order to achieve credibility, confirmability, transferability, and dependability while performing qualitative research, the requirements are centered on trustworthiness[99].

The triangulation of findings[99], which entails gathering both quantitative and qualitative data, guaranteed credibility and confirmability. Likewise, the observation checklist (Annexure 4) and the interview schedule (Annexure 2) made sure that the same data was gathered. Researcher debriefing[99] was also employed throughout analysis, which established confidence in the qualitative data by using independent analyst (acknowledged in publications) through the methodical procedure of intercoder agreement.

A "rich description"[99] of the qualitative data was used to achieve transferability. This included in-depth descriptions of the experiences of participants who might influence the use of decentralised training platforms by virtue of their [key informants] involvement in the teaching and learning process in this setting. Furthermore, the qualitative study's trustworthiness was guaranteed via peer debriefing, which is covered in the paragraph above.

The trustworthiness of qualitative research is based on the idea that a transparent audit trail of the study is accessible and able to be evaluated by anyone outside the study to confirm that the results are reliable and repeatable [99]. The NRF study provided gatekeeper permissions from the four participating universities. The permission letters have not been included as appendices in this thesis. This PhD thesis's qualitative component's trustworthiness was verified in two methods. First, by presenting the research techniques to the Faculty Graduate Studies Committee, the Human Research Ethics Committee (HREC) (Medical), and the protocol phase—three crucial stages in this PhD journey—for assessment. Second, to recognise the halfway point of the PhD study, an interim seminar was held, which is a prerequisite of the PhD programme.

The preliminary results and an audit trail, which is a summary of the procedures followed during the research process, were presented to two external assessors for assessment during this seminar. The presentations mentioned above also guaranteed the validity of the qualitative components of the PhD thesis and demonstrated that the procedures followed during the

research process, the instruments used for data collection, and the data themselves were legitimate and suitable for addressing the thesis's goals [99].

I continuously engaged in a reflexive approach during my PhD journey, which entailed considering how my assumptions would influence the study's conclusions. During the intercoder agreement process, I was continuously pushed to view the data through the many lenses that the analysts presented, thus researcher debriefing became an essential part of this reflexivity supporting reliability and validity.
The above-mentioned procedures were essential for confirming the results of qualitative study's trustworthy [99].

3.6 Quantitative component of the PhD study

Determining the use of students' time while at the decentralised training platforms across the institutions through the log diaries in this thesis was the aim of the quantitative component (Chapter 5).

3.7 Integration of qualitative and quantitative findings

Combining the statistical strength and generalisability of quantitative data with the richness and context-rich insights of qualitative data is known as "integrating qualitative and quantitative findings." Researchers confirmed and enhanced their findings using this mixed-methods technique, which offered a more thorough comprehension of the study subject. For example, quantitative data can support the patterns and themes found in qualitative research, while qualitative data can provide the "why" behind trends shown in quantitative data. This integration strengthened the findings' resilience and may produce more insightful and useful information.
The process of coding data involved collaborative support to ensure accuracy, consistency, and depth in analysis. The researcher, supervisor, and independent reviewer worked together to integrate emerging codes.

The researcher played the primary role in developing initial codes through close engagement with the data. The researcher identified patterns, themes, and categories, reflecting the researcher's firsthand understanding of the material. The researcher's familiarity with the context and nuances of the data laid the groundwork for subsequent discussions.

The supervisor offered critical oversight and mentorship throughout the process. The supervisor helped refine the emerging codes by providing feedback on their clarity, relevance, and

alignment with the research objectives. The supervisor also suggested alternative interpretations, encouraging a more robust coding framework.

An independent reviewer added an external perspective to the coding process. By reviewing the data and proposed codes without prior involvement, the independent reviewer helped to minimise biases and validate the findings. The independent reviewer's role ensured that the coding remained objective and comprehensive.

The integration of the emerging codes involved iterative discussions and comparisons among the researcher, supervisor, and independent reviewer. They examined the similarities, differences, and gaps in their interpretations. Through these exchanges, they achieved consensus on the final coding framework, ensuring that it was both reflective of the data and methodologically sound.

This collaborative approach enhanced the credibility of the findings by combining diverse perspectives while maintaining rigor and transparency in the coding process.

3.8 Research ethics and ethical considerations

Ethical approval M170704 and M240358 as per Annexure 11 and Annexure 12. Research ethics was essential to guaranteeing the trustworthiness, quality, and societal relevance of the educational research process and findings. The broad area of ethical considerations encompassed a wide range of issues, including the protection of participants' rights, the integrity of the research process, and the proper dissemination of findings. Participants were fully informed about the study's objectives, procedures, potential risks, and benefits before giving their informed consent. This process respected participants' autonomy while fostering confidence in their contribution to the study.

To safeguard participants' privacy and personal data, secrecy and anonymity was upheld. Avoiding any kind of injury to participants—physical, psychological, or emotional—is another duty of researchers. Being aware of the power relationships between teachers and students was part of this. Transparency in disclosing results, refraining from plagiarism, and appreciating the contributions of others are other components of ethical research in education. Researchers need to be aware of conflicts of interest and make sure that there is no prejudice or manipulation in their work. Education researchers may develop knowledge in a way that is responsible, courteous, and advantageous to society by abiding by these ethical guidelines.

3.8.1 The ethics conducting medical education research

The objective of medical education research is to enhance the instructional, educational, and evaluative techniques employed in medical schools and training programmes.
Ensuring ethical concerns is essential for safeguarding the welfare of learners, patients, and the credibility of research results. The purpose of educational value is to guarantee that research makes a meaningful contribution to educational practice, examine the pertinent inquiries in medical education and distribute findings to benefit the wider community.

3.8.2 My own positionality and reflexivity

Being an educator for the past 14 years has afforded the opportunity to engage with undergraduate medical students and has profoundly shaped my understanding of both educational practices and community healthcare dynamics. Through the collaborative exploration of healthcare challenges in local communities, particularly rural communities, I have recognised the importance of fostering an experiential learning environment that encourages students to integrate theoretical knowledge with real-world applications. The research process has revealed not only the complexities of community health disparities but also the potential for students to become proactive agents of change. By facilitating discussions and hands-on projects, I aimed to cultivate a sense of social responsibility and cultural competence among my students. This reflective journey has illuminated the reciprocal relationship between teaching and research; as I guided students through various research methodologies, I too was enriched by their fresh perspectives and innovative solutions. Ultimately, this symbiotic engagement underscores the critical role of education in addressing healthcare inequities and enhancing community well-being.

The positionality of the author as a non-medical person significantly shaped her perspective and approach to the study, introducing both unique opportunities and challenges. Intersectionality, the framework for understanding how multiple aspects of a person's identity intersect to influence their experiences and worldview, also played a role in shaping the interpretation and motivation.

As a non-medical individual, the author approached the study with fresh eyes, unbounded by traditional medical paradigms. This position allows for the incorporation of interdisciplinary insights, drawing from fields such as sociology, anthropology, or public policy, which enriched the study's scope. The absence of formal medical training might also prompted the author to emphasise patient-centered approaches, focusing on lived experiences and social determinants

of health rather than purely biomedical factors. However, it also necessitated a conscious effort to engage with medical literature and collaborate with healthcare professionals to ensure the study's credibility and relevance.

Intersectionality highlights how the author's unique combination of identity factors—such as her educational background, cultural context, or personal experiences—shaped her motivation and interpretation. For example, her background in public health inspired the author to focus on health inequities, while personal experiences with healthcare systems drove a commitment to more inclusive and empathetic care models. These intersectional influences encouraged the author to critically examine systemic barriers and advocate for a holistic understanding of patient needs.

Acknowledging these positionalities has enhanced the study's reflexivity, ensuring that the author's biases and perspectives were transparently addressed. It also enriched the study by incorporating diverse viewpoints, ultimately contributing to a more comprehensive and nuanced understanding of the research topic.

The intersection of education and research in medical settings serves as a foundational component for cultivating future healthcare professionals equipped to address community needs. Within this dynamic framework, educators are tasked with designing curricula that not only impart essential medical knowledge but also foster critical thinking and empathy among students. Simultaneously, as researchers we contribute to the evolution of medical education by investigating pedagogical methods that enhance learning outcomes, ultimately benefiting patient care. These findings can reshape educational strategies, ensuring that training aligns with the evolving challenges in healthcare. This symbiotic relationship emphasises the importance of collaboration between educators and researchers, as both play pivotal roles in creating an adaptive learning environment. Reflecting on my experiences, I recognise that this dual capacity enriches the educational process, facilitating a more comprehensive approach to healthcare that extends beyond the classroom and into the communities we aim to serve

This has impacted on self-reflection on my teaching practice and has offered the opportunity to refine my teaching practices and enhance student learning experiences. By systematically analysing my instructional approaches and the subsequent outcomes. As an educator, I can identify effective strategies as well as areas needing improvement. This iterative process not only supports the development of self-regulated learning but also fosters essential reflective skills, a vital for clinical competency for undergraduate medical students. Furthermore, embracing self-reflection encourages a culture of inquiry and openness, particularly in medical

education, where adaptability and resilience are crucial. As I worked with undergraduate medical students, I recognised that this reflective practice led to deeper connections in identifying community healthcare needs and tailoring educational interventions accordingly. Ultimately, the self-reflection has served as a cornerstone for my professional growth, allowing me to evolve my methodologies in ways that significantly impact both student engagement and community health outcomes.

The complexities of working with undergraduate medical students have necessitated a profound transformation in my own understanding and practice as an educator. Engaging with students during their formative years has highlighted the critical role of self-regulated learning in medical training. The research indicates that portfolios serve not only as tools for assessment but also as facilitators of personal reflection and growth, enhancing the student's ability to engage in self-regulated learning phases, such as performance, reflection, and planning. This dynamic interaction has fostered my continuous development alongside my students. Moreover, the emphasis on cultivating critical thinking skills resonates deeply with my mission to support resilience and open-mindedness in future healthcare professionals. The perspectives of students within this educational framework illuminate the transformative power of reflective practices, directly influencing my pedagogical approach and ultimately enriching the learning environment.

Engaging undergraduate medical students in collaborative research has not only enriched their learning experiences but has also fostered a sense of responsibility toward community health. I have observed that students develop essential skills in self-regulated learning, particularly in implementing performance, reflection, and planning phases.

This approach allows students to actively contribute to local healthcare solutions while refining their critical thinking and problem-solving abilities. As I reflect on this journey, it is evident that fostering a collaborative research environment not only improves healthcare outcomes for local communities but also promotes the personal and professional growth of students, preparing them to be competent and compassionate practitioners.

In my journey as an educator and researcher, I have observed the profound impact that active student engagement can have on community health outcomes. Through experiential learning initiatives, undergraduate medical students are empowered to investigate pressing health issues, such as food insecurity, and collaborate directly with community members. This approach aligns with the principles of problem-based learning, which stimulates students' critical thinking and fosters an intrinsic interest in public health concerns. By integrating community-

based participatory research into our curriculum, students can develop not only analytical skills but also a deeper appreciation for the social determinants of health as they work alongside patients. This hands-on involvement not only enhances students' educational experiences but also contributes to more targeted and effective health interventions that resonate with community needs, thereby creating a sustainable impact on overall health scenarios within local populations.

The journey through educating and researching alongside undergraduate medical students has illuminated the intricate relationship between personal growth and communal health outcomes. Engaging deeply with these emerging professionals has not only enhanced the clinical competencies of students but has also prompted profound self-reflection on my own practices and beliefs as an educator. This reciprocal learning approach has underscored the necessity of adaptability and empathy in teaching methodologies, as well as the significance of community-oriented strategies. Observing students applying theoretical knowledge to real-world healthcare challenges in local settings has reinforced the idea that education extends beyond the classroom, serving as a catalyst for social change. Furthermore, the research process has been a pivotal aspect of this journey, revealing the complexities involved in effectively addressing healthcare disparities and fostering collaborative solutions. Overall, this experience has solidified my commitment to continue bridging academia with community needs for improved health outcomes.

As the landscape of healthcare continues to evolve, the role of educators and researchers in community health initiatives must adapt accordingly. Importantly, the integration of interdisciplinary approaches fosters a more holistic understanding of community needs and enhance the effectiveness of health programmes. For future directions, there is a critical need for collaborative partnerships among academic institutions, local organisations, and health practitioners. Such alliances will not only facilitate the exchange of knowledge but also ensure that interventions are grounded in the socio-economic realities of the communities they aim to serve. Moreover, empowering undergraduate medical students with research opportunities in community health can cultivate a sense of responsibility and engagement, promoting sustainable health initiatives. I am further led to believe that ultimately, continuous reflection and feedback mechanisms will enable educators and researchers to refine their methodologies, ensuring that future efforts are both impactful and responsive to the evolving challenges of public health.

3.9 Potential bias, limitations and amelioration

This section describes the study's limitations, possible bias, and the measures taken to overcome those limitations and reduce potential bias.

3.9.1 Potential bias and overcoming bias

In this study, the potential sources of bias were non-response bias and observation bias.

Non-response bias: When research participants who do not participate are consistently different from those who do, this is known as non-response bias. The questionnaire was created to be brief, with items that were clear and easy for participants to understand, so order to account for any non-response bias. Additionally, the log diary was transferred to the REDCap platform for tablet computers, and the survey was completed via a touch screen, making it easy, quick, and private to complete. Developing a relationship with students was one of the additional strategies to counteract non-response bias. The log diary ultimately achieved response rates above 80%, guaranteeing representativity.

Observation bias: One possible cause of bias in the observations at decentralised training locations was observation bias. Systematic discrepancies in the collected observations may give rise to observation bias in the observational research. The researcher was familiar with the teaching practices and educational environments at the four universities, which helped to minimise observer bias. In order to guarantee uniformity of the observations and to provide flexibility for observations to incorporate information not included in the guide, an observation guide was also employed for data collecting.

3.9.2 Study limitations and amelioration

A limitation of the thesis was the selection of DTPs that represent the spectrum of DTPs. The selection of the DTPs currently used by the four universities was constrained by the availability of current sites being active DTPs at the time of data collection. Some sites were not active due to the unavailability of preceptors, deeming those sites out of use. A purposive sample of sites was identified to represent one urban, one peri-urban and one rural site in use across all the universities in the study. This provided a balanced representation for comparison. Twelve DTPs did provide valuable and in-depth information on types, similarities and differences across the DTPs used at the four universities. However, it may not be possible to generalise the findings to all DTPs at the four universities or to South Africa as a whole.

A limitation was the poor uptake of student participation from the institutions. At the time of data collection, two institutions had student boycott demonstrations which hampered

recruitment of students. Support of the representative student structures was enlisted to encourage student participation.

Another limitation in the study relates to the observational bias in data collection at the selected sites. The findings resulted in site-specific representation, the observer effect, selection bias, observer bias, and environmental and contextual factors.

Site-specific representation led to data that may not reflect broader trends or conditions, making it less generalisable to other contexts. The observer effect influenced the behavior of preceptors and students being studied, leading to results that deviate from their natural behavior. Selection bias could have introduced a bias when sites were chosen based on convenience. Observer bias may have unconsciously influenced data collection and interpretation, focusing on data points that confirm hypotheses while overlooking others.

Environmental and contextual factors may also have influenced data collected, distorting the results without proper controls or adjustments. Addressing these limitations required strategies such as randomisation in site selection, using multiple observers to reduce individual biases, and incorporating complementary data collection methods to validate observational findings.

4 CHAPTER 4: Context, types, and utilisation of decentralised training platforms in undergraduate medical education at four South African universities: Implications for universal health coverage.

4.1 Publication details

Chapter four is presented as a published paper. The paper provides an overview of the characteristics of the DTPs used by four institutions and structures a framework to classify these DTPS. This paper was published in Cogent Education. Cogent Education is a multidisciplinary open-access journal, publishing high-quality, peer-reviewed articles across the breadth of educational research.

4.2 Journal details

Title of the Publication: Context, types, and utilisation of decentralised training platforms in undergraduate medical education at four South African universities: Implications for universal health coverage.

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4.3 Details of author contribution

The Contributor Roles Taxonomy (CRediT)[100] was used to outline the authors' contribution to the study. The full explanation of the terms is in Annexure 13.

4.3.1 Table 3:1: Details of author contribution

	Dreyer	Rispel
Conceptualisation	✔	✔
Method	✔	✔

Resources	✔	
Manuscript writing draft	✔	
Manuscript writing review and editing	✔	✔
Supervision		✔

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4.5 Published article: Context, types, and utilisation of decentralised training platforms in undergraduate medical education at four South African universities: Implications for universal health coverage.



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PROFESSIONAL EDUCATION & TRAINING | RESEARCH ARTICLE

Context, types, and utilisation of decentralised training platforms in undergraduate medical education at four South African universities: Implications for universal health coverage

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Additional information is available at the end of the article

Abstract: In concert with global developments, South Africa has embarked on an ambitious set of health care reforms towards universal health coverage (UHC) that necessitate the transformation of health workforce education. This study explored the context, types, and utilisation of decentralised training platforms (DTPs) in undergraduate medical education at four South African universities, and the implications for universal health coverage. The study was conducted at the health sciences faculties of Sefako Makgatho Health Sciences University, the University of KwaZulu-Natal, Walter Sisulu University and the University of the Witwatersrand. Following informed consent, semi-structured interviews were conducted with 17 key informants who were selected purposively based on their in-depth knowledge of and current involvement in undergraduate medical education. The questions focused on the number and type of DTPs used in undergraduate medical education, benefits of DTPs, innovations or good practices, community engagement, the challenges or constraints of DTPs and institutional investment in DTPs. The interviews were analysed using thematic analysis. The study found that context, notably the history and evolution of DTPs and the expressed vision and philosophy of medical education, influenced the type, characteristics, and utilisation of DTPs. All four



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Professor Laetitia Rispel is the doctoral research supervisor of Abigail Dreyer. She holds a South African Research Chair on the Health Workforce and is Professor in the School of Public Health at the University of the Witwatersrand, South Africa. Her research interests are human resources for health, quality of care, performance of the health care system and the intersection of these with the social determinants of health.

PUBLIC INTEREST STATEMENT

The platform for the education and training of medical students is critical to achieving long-term changes in the attitudes of graduates, and their decisions to work in rural and other underserved areas. Decentralised training platforms (DTPs) have the potential to achieve these changes. These DTPs are characterised by their location away from the main university campus, and include clinics, small hospitals and community organisations. However, there is not a lot of information on these DTPs in South Africa. Hence, we interviewed key individuals in senior positions at four South African universities to obtain new knowledge on DTPs. The study found that these four universities mostly used small hospitals as DTPs, rather than clinics and community organisations that required more resources [120 words]

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universities reported utilisation of various DTPs in the undergraduate medical education programmes, but there were differences in the institutional arrangements on medical education, and the type and nature of investments in DTPs. The DTPs were primarily hospital-based, with the utilisation of PHC facilities constrained by insufficient resources, and competition with clinical disciplines. DTPs are an essential component of transformative medical education, and require an explicit vision, and institutional investments in human resources, finances, and infrastructure to realise the goal of UHC.

Subjects: Higher Education; Medical Education; Primary Health Care & Family Practice

Keywords: decentralised training platforms; distributed medical education; health workforce; transformative medical education; South Africa

1. Background

The twin challenges of achieving universal health coverage (UHC) (WHO, 2014) and of solving the global health workforce crisis (WHO, 2016) cannot be achieved without transforming health professional education. The urgency to transform health professional education is hastened by the need to respond to a combination of demographic and epidemiological transitions (Crisp & Chen, 2014) and to meet the needs for health professionals in rural, remote and under-served areas(WHO, 2016). In concert with global developments, South Africa has embarked on an ambitious set of health care reforms towards UHC (NDoH, 2017) that underscore the importance of PHC and the transformation of health workforce education (Academy of Science of South Africa, 2018).

Decentralised training platforms (DTPs) refer to any education or learning environment such as a primary health care (PHC) facility, district hospital, non-governmental or community-based organisation that is used for health professional education and training. Situated away from the main university campus, DTP exclude tertiary academic hospitals and are close to and/or engage with communities. DTPs have been proposed as one of the important strategies to achieve health workforce educational reforms, in conjunction with other reforms such as rural student selection (Frenk et al., 2010; Strasser et al., 2009; De Villiers et al., 2017; Woolley et al., 2016).

The theory of change of DTPs is exposure of students to prevalent health conditions (rather than rare conditions seen in tertiary hospitals), the social determinants of health (SDH), and the diversity of communities and cultures (Dunbabin & Levitt, 2003; Hirsh et al., 2012; Strasser et al., 2009; Strasser & Neusy, 2010). The DTPs facilitate community engagement and relationship building, enabling students to view people holistically in their social contexts (MacLeod et al., 2015; Mennin & Mennin, 2006; Strasser & Neusy, 2010). Learning in a community-based context provides an opportunity for students to experience the continuum of health care and to build socially accountable relationships with communities (Strasser et al., 2009; Woollard, 2010). Students also experience different pedagogies at the DTPs (MacLeod et al., 2015). The anticipated outcomes of DTPs are an increased proportion of skilled medical practitioners willing to work in general practice and/or rural and other under-served areas (Strasser et al., 2009) and a more equitable distribution of health professionals, especially in low and middle-income countries (LMICs) (Crisp & Chen, 2014; Woolley et al., 2016).

The majority of studies on the impact and/or critical success factors of decentralised or distributed medical education have been done in Australia (Sen Gupta et al., 2014; Solarsh et al., 2012; Woolley et al., 2016; Woolley et al., 2016), Canada (Lanphear & Strasser, 2008; Strasser et al., 2009; Strasser et al., 2018; Saxena et al., 2018; Snadden & Bates, 2005; Veerapen & Sean, 2010), and the United States of America (USA) (Cosgrove & Bar-on, 2017; Greer et al., 2018). These studies have found that rural student recruitment, different pedagogical approaches, longitudinal placements, community participation, university investment, adequate

resources, and leadership and stakeholders' support are important to achieve transformative medical education, and sustained community level impact (Greer et al., 2018; Solarsh et al., 2012; Woolley et al., 2016). In LMICs such as Vietnam (Luu & Wright, 2008) and de Souza et al., 2008), medical education reforms have focused on community-university partnerships, community-based education, and transforming curricula in support of health care system goals (de Souza, Zeferino and Ros 2008). These initiatives provide valuable lessons, but the context is different to that in South Africa, and there is insufficient published information on the DTPs.

In sub-Saharan Africa, the Medical Education Partnership Initiative (MEPI) (Goosby & Deborah, 2014 benefited 13 Medical Schools in 12 sub-Saharan African countries, including South Africa (Omaswa et al., 2018). Although the nature of the medical education reforms differed, MEPI enabled an increase in the use of and time spent at DTPs, and placement of students in rural areas (Kebaabetswe et al., 2017; Kibore et al., 2014; Kiguli-Malwadde et al., 2015; Kizito et al., 2017).

In 1994, South Africa inherited a higher education system that reflected the apartheid legacy of race, class and gender inequalities in access to and provision of higher education (The Presidency, South Africa, 2019). The 1997 Government White Paper on the transformation of Higher Education provides the policy framework for new planning, governance and funding arrangements to address the historical inequalities, structural inefficiencies and service duplication under apartheid (Department of Education, 1997). In 2016, there were 26 public Higher Education Institutions (HEIs) in South Africa (The Presidency, South Africa, 2019). Public HEIs receive government funding through the Department of Higher Education and Training. These are the only institutions that are legislated to provide medical education (Burch, 2007). At the time of the study, eight of the 26 universities provided undergraduate medical education (Van Der Merwe et al., 2016). Seven of the eight medical schools offer a six-year curriculum for the undergraduate medical degree, one offers a five-year programme, and one of the eight offers a graduate entry programme (Van Der Merwe et al., 2016). In 2014, these eight universities offered close to 2000 places to first-year medical students, with a range of 120–300 per university (Van Der Merwe et al., 2016). Notwithstanding individual institutional rules regarding admission, the majority of students admitted into the undergraduate medical programme are those who have completed the senior or school-leaving certificate (Van Der Merwe et al., 2016).

In South Africa, there have been encouraging medical education reforms since 1994, which marked the formal end of apartheid (Academy of Science of South Africa, 2018). These reforms include curriculum reforms, faculty development, and inclusion or expansion of DTPs as part of the teaching platform of medical students (Hartman, 2009). Since 2015, two scoping reviews explored the characteristics of DTPs, and the pedagogies used at these sites (Mlambo et al., 2018; De Villiers et al., 2017). One study reported that DTPs did not influence medical students' stated intention to return to these communities after graduation (Van Schalkwyk et al., 2018). Nonetheless, the reported benefits of DTPs include the expansion of the teaching platform to increase the production of medical graduates (WHO, 2013), attraction to and retention of graduates in rural and other underserved areas (Couper & Hugo, 2014), enhanced social accountability of graduates (Green-Thompson et al., 2012), and changing negative views about PHC or non-tertiary level services (Couper & Hugo, 2014; Hartman, 2009).

Importantly, knowledge gaps remain on the types of DTPs used at different universities in South Africa, whether these DTPs are an integral part of the undergraduate curriculum, the extent of engagement with, or participation of communities, and the views of key policy actors on the benefits, challenges and constraints of DTPs. Hence, the aim of this study was to explore the context, types, and utilisation of DTPs in undergraduate medical education at four South African universities, and the implications for UHC. The paper is part of a larger doctoral study on DTPs, transformation and undergraduate medical education.

2. Methods

2.1. Study setting

This study was conducted at four South African universities: Sefako Makgatho Health Sciences University (SMU), the University of KwaZulu-Natal (UKZN), Walter Sisulu University (WSU) and the University of the Witwatersrand (Wits). These four universities were selected purposively, as part of a larger study funded by the South African National Research Foundation (NRF). These four universities constitute 50% of the universities that offer under-graduate medical education (Van Der Merwe et al., 2016). Furthermore, the four universities provide examples of different levels of resources, urban or rural location, and length of time since the commencement of medical education. Refer to Table 1 for an overview of the study setting.

2.2. Study design

This was a comparative case study, using qualitative methods, specifically in-depth interviews with key informants in the four selected universities. The interviews were complemented with a review of each institution's curriculum documentation for final year students in the medical programme.

Table 1. Overview of the study setting

Characteristic	SMU	UKZN	WSU	Wits
Provincial location	Gauteng	KwaZulu Natal	Eastern Cape	Gauteng
Size of the provincial population*	15 176 116 (25.8%)	11 289 086 (19.2%)	6 712 276 (11.4%)	15 176 116 (25.8%)
Urban-rural population distribution	Urban 97.2% Rural 2.8%	Urban 46.0% Rural 54.0%	Urban 38.8% Rural 61.2%	Urban 97.2% Rural 2.8%
Historical background(Burch, 2007)	Previously known as Medical University of South Africa (MEDUNSA), which opened a medical school in 1977, SMU was established in 2014.	Established in 2004 through the merger of University of Natal, opened medical school in 1951, and the University of Durban-Westville.	WSU formed by a merger between the previously known as University of the Transkei (UNITRA), and the former Border and Eastern Cape technikons. University of Transkei opened medical school in 1986. WSU was established in 1977.	Classified as a historically white university had the year medical school opened as 1921.
Total student population	6 410	46 510	32,081	38 350
Length of medical degree programme	6 years	6 years	6 years	6 years for 2/3 of students. Only university in South Africa with graduate entry medical programme- graduates who meet the entry requirements, do four years of study
Annual first-year medical student intake	~230	~250	~150	~250

*Statistics South Africa: Mid-year Population Estimates 2019(STATS SA 2019)

Census 2001: Investigation into appropriate definitions of urban and rural areas for South Africa(STATS SA, 2003)

2.3. Key informant selection

The aim of the study was to explore the context and utilisation of DTPs at the four selected universities. Consequently, the principal researcher selected key informants purposively based on their roles, current involvement in the undergraduate medical education and in-depth knowledge of DTPs. At each university, the senior academic (dean or other designation) responsible for teaching and learning was interviewed (four individuals). The principal researchers also interviewed four heads of departments from family medicine, three heads of departments from obstetrics and gynaecology, three heads of departments from public health, two heads of departments from paediatrics and one co-ordinator from an undergraduate unit for medical education.

These individuals met the criteria for the comparative case study (Tomaszewski et al., 2020), as they were the custodians of the undergraduate medical education programmes., These departments have historically used DTPs in the teaching of medical students. Hence, we identified 20 potential key informants to interview.

2.4. Development of the interview guide

In line with the study objectives, the interview guide focused on: the nature, number and type of DTPs used in undergraduate medical education; inter-professional education; university investment; resource allocation; perceived benefits of DTPs; institutional innovations; community engagement and relationships; and the challenges or constraints of DTPs. Three researchers assisted with the content validity of the interview guide.

The interview guide was piloted with an educational expert to determine clarity of questions, applicability across four universities: and the length of time taken for the interview. The educational expert has extensive experience of under-graduate health professional education, including medical education. At one stage, the person headed the education unit at one of the four selected universities, with the institutional memory on medical education transformation initiatives, including policy decisions on DTPs. The expert recommended a change to the flow of questions, which was implemented after the pilot.

2.5. Data collection

The principal researcher (ARD) contacted key informants to request their voluntary participation. Once the key informant agreed to participate, the principal researcher arranged to conduct the interview at a convenient time and venue. Each key informant received a verbal explanation of the study and a detailed information sheet. Following written, informed consent for both the interview and recording, the principal researcher conducted the interview using the interview guide. At the end of the interview, the principal researcher requested a comprehensive list of the DTPs utilised, and copies of the undergraduate medical education curricula, including DTP objectives.

All interviews were conducted in English and recorded digitally. Each interview lasted an average of 40 minutes, but the length of time varied depending on the key informant responses. The principal researcher also took detailed notes. All data was stored on a password-protected computer.

2.6. Data analysis

Each interview was allocated a unique identifier to ensure confidentiality of information and transcribed verbatim. The principal researcher ensured quality assurance of all the transcribed interviews.

The interviews were analysed using thematic analysis and inductive coding (Joffe, 2012). The initial step in the analysis was to read, and re-read the interviews to ensure familiarisation of the data (Braun & Clarke, 2006). Three researchers—the principal researcher, supervisor and a senior external academic with extensive teaching expertise- read and coded three interviews independently. Once the codes were generated, a meeting was held to agree on codes and to generate themes, thereby ensuring inter-coder-reliability (Nowell et al., 2017). The principal researcher coded the remainder of the interviews systematically.

2.7. Ethical considerations

The Human Research Ethics Committee (Medical) of the University of the Witwatersrand approved the study (M170 704). All ethical guidelines were complied with, including a detailed information sheet, informed, written consent, voluntary participation, and confidentiality and anonymity of individual responses. The digital recordings of the interviews are stored on a password-protected computer. These recordings will be deleted two years after the publication of the PhD thesis.

2.8. Trustworthiness and rigor

We ensured credibility by prolonged engagement with key informants, audio recording of the interviews, verbatim transcription of the data, and ongoing quality assurance (Mandal, 2018). We ensured dependability by having a semi-structured interview schedule and a detailed description of the methods, data collection and analysis. Conformability was ensured through independent coding of three, diverse interview transcripts, discussion of, and agreement on, the codes and themes by three researchers, and application of the themes to the data (Mandal, 2018; Nowell et al., 2017).

3. Results

3.1. Characteristics of key informants

The principal researcher conducted 18 in-depth interviews, made up as follows: SMU (4); UKZN (4); Wits (6) and WSU (4). One key informant participated in the interview, but upon completion requested that the information be withdrawn. One prospective key informant withdrew from the interviews because there was no utilisation of DTPs at the time of interviews. One key informant was unable to commit to an interview date and time and after seven attempts to schedule the interview, the person was excluded. Hence, we present the results of 17 key informant interviews.

The majority of the key informants were male (10/17 = 59%), which could be due to the skewed gender profile of senior academic staff at the selected universities. There were variations in the length of time of the key informants in their respective portfolios that ranged from two years at the time of the interview, to more than 30 years. All the key informants were well positioned to speak about their respective medical education programmes and of the characteristics and utilisation of DTPs.

3.2. Emerging themes

Although inter-related and inter-dependent, five themes emerged from the interviews. These themes and sub-themes are shown in Table 2 and described further below.

3.3. Institutional arrangements on medical education

All four institutions had a senior academic responsible for teaching and learning of all undergraduate health sciences students, who provided strategic leadership of health professional education and participated in the health sciences executive management structures.

Three institutions (SMU, WSU and Wits) have specialised units to oversee and coordinate undergraduate medical education programmes. SMU established their unit in 2003, WSU in 2014 and Wits in 2016. At UKZN, a specialised unit for DTPs was established in 2016 as a joint initiative of the KwaZulu-Natal Department of Health (KZN-DOH) and UKZN's College of Health Sciences.

3.4. Context of DTPs

Key informants reported that the context fundamentally shapes DTPs utilised in the undergraduate medical education programmes. This context includes the history and evolution of DTPs at each institution and within each of the selected disciplines, the interplay of political and social factors, and the institutional vision of DTPs.

Table 2. Summary of themes and subthemes

Theme	Subtheme/s
(1) Institutional arrangements on medical education	• Leadership and management of medical education • Level of seniority
(2) Context of DTPs	• History and evolution of DTPs • Political and social factors • Institutional vision of DTPs
(3) Philosophy of medical education	• Community-based education • Social accountability • Inter-professional education • Focus on social determinants of health
(4) Characteristics of DTPs	• Geographical location • Type of DTP • Practice of DTPs (site utilization, length of rotation, integration/synergies) • Logistics • Supervision of students • Engagement and representation of stakeholders
(5) Investments in decentralised education and training	• Investment in human resources • Financial investment • Infrastructure and technology investment

Three of the four institutions (SMU, WSU and Wits) indicated that the institution's commitment to DTPs evolved from the changing context of medical education as well as global and national imperatives for the transformation of medical education. Only the UKZN curriculum documentation included DTPs and associated guidelines explicitly.

At SMU, key informants indicated that there is a long history of DTPs, with strong PHC and community focus, which starts early in the undergraduate programme. Students do home visits and complete a community resource visit.

> They do their home visit, and there's also an assignment, called the community resource visit. They [medical students] identify the resources around the clinic, or around the hospital, and they visit one resource. The [students] say: "We are learning more about the community, also family medicine, because it's not only a clinical problem." (KI 11, SMU)

However, the extent of DTP utilisation varied across the disciplines, and the exposure to PHC appears to be for short periods. Some key informants highlighted the poverty in many of the surrounding communities, which in turn shapes both the experiences, attitudes, and safety of students at these DTPs, and ultimately their utilisation.

At UKZN, key informants highlighted major developments since 2010, including curriculum changes, increased integration across disciplines, a strong PHC approach, community-oriented primary care in family medicine, and significant university investments in decentralised medical education.

> The organisational decentralisation, so a shift within the system, moving from tertiary to primary and then to the community. In first year, that's all at Medical School, second year the selectives are actually in PHC clinics and in the community. The fourth year IPC (Integrated Primary Care) 1 is in PHC clinics. The fifth year is in the district hospital OPD. And final year is in the rural district hospitals, but within that block they go out with the ward-based outreach team,

the WBOTs. And then we've also got a volunteer program where students can choose to live in the community. (KI 4, UKZN)

Key informants highlighted that the PHC and public health content of the majority of the lectures was elementary.

It's a year-long module that undergraduates are exposed to, in which we coordinate, but it is joint input from Public Health Medicine, Family Medicine, Behavioural Medicine, and Occupation Environmental Health. The majority of the lectures focus on public health, and dealing with the history of public health, introducing them to concepts of primary health care and public health, and concepts of epidemiology and disease burden. (KI 02, UKZN)

Transformative medical education was seen as an important UKZN mandate, which involved curriculum changes, a formal memorandum of agreement with the provincial department of health, and innovations like homestays. The latter is a voluntary programme where medical students can choose to live with families in the community.

Although DTPs have been used since 1992, WSU introduced the Integrated Longitudinal Community Clerkship in 2014. This involves fifth year medical students spending 20 weeks at one of the designated DTPs. Key informants highlighted the support from the provincial department of health, with joint appointment of staff at the decentralised sites whose responsibility is to teach the students. The benefits of the longitudinal clerkship included students choosing rural areas where they grew up and giving inspirational talks to high school students.

Wits University has utilised DTPs for more than 30 years, but the type of DTP, innovations, and relationships with provincial health departments have changed over the period. Key informants pointed out that PHC clinics were the predominant DTPs used in the early years, as well as the "rural" block as part of public health. However, because of larger class sizes, and logistical difficulties, there has been a reduced utilisation of PHC clinics for medical training.

Wits University has invested variably in PHC facilities in Gauteng Province and in the Wits Rural Facility in Mpumalanga Province. Since 2014, Wits has invested in a large regional hospital in North West Province. Key informants pointed out that the attractiveness of the latter is its ability to serve as a DTP for more than one clinical discipline. However, this necessitates University partnerships with three provinces, which introduced both complexities, and changes in the DTPs and/or relationships with stakeholders.

3.5. Philosophy of medical education

The majority of key informants reported on educational changes introduced, especially in the preceding decade. They underscored the importance of medical curricula that are responsive to the needs of communities, while ensuring the production of competent medical doctors who meet the requirements of the Health Professions Council of South Africa (HPCSA). Key informants described the underlying medical education philosophies implicitly, and varied teaching approaches including the use of standard national guidelines, logbooks, portfolios, clinical case studies, case scenarios, simulated learning tools, clinical procedures and video presentations. However, the curricula were not explicit on the underlying educational philosophies at the DTPs.

At SMU, the key informants highlighted community-based education, a strong focus on relationships with communities and with the health facilities, the importance of the social determinants of health, and of social accountability. This is embedded in the first-year medical student community profile of which students have to give feedback on the assessment to the community, as well as provide practical advice.

At UKZN, WSU and Wits University, key informants also referred to community engagement, community-based education and social accountability, and the importance of teaching medical students about the social determinants of health.

Key informants at WSU emphasised community-centredness and social accountability embedded in the programme.

Also, that social accountability, responsibility. They (medical students) know … if you interview at the end of their ILCC (Integrated Longitudinal Community Clerkship), they know that they need to go back to these rural areas. (KI 4, WSU)

At Wits University, key informants highlighted social accountability, community-based interactions as part of different disciplinary activities, and both a recognition of, and teaching on the social determinants of health.

In their fifth year, they go out to Bushbuckridge [a rural area] as part of their public health block. We expose them to programmes outside the health facility that are related to public health and to the prevention of disease. So environmental health, the malaria control programme as a population-based intervention, they visit the homes, they talk to people in the home, just to get a sense of people's living conditions, environment where people live, and some of the health needs of people. (KI 10, Wits)

3.6. Characteristics of DTPs

The institutional context, the evolution and nature of the medical education programme and the needs of individual clinical disciplines influenced the characteristics of the DTPs, with great variation across the four institutions.

SMU reported a mix of DTPs in urban, informal settlements and in rural areas dependent on availability and proximity to the main campus for logistical reasons. The DTPs include community visits, PHC facilities, and district hospitals, but implementation of DTPs is complex.

In first year, they spend four days, four Fridays. In second year, they spend five Wednesdays. In third year, they spend five Tuesday afternoons in the one block, and then one Tuesday afternoon in the other block, so it's about six Tuesdays. In fourth year, they go on two Mondays, two Thursdays, to clinic areas and communities, and two Saturdays to casualties also. In year five, we do not send students out. (KI 4, SMU)

The SMU programme employs doctors and nurses as supervisors, and they utilised custom-developed learning guides. Key informants reported that patients and communities were happy with the services provided by staff and students, and often expressed a desire for more services. Other key informants highlighted that internet connectivity and safety considerations play an important role in the utilisation of DTPs.

UKZN DTPs include a mix of community-based sites, PHC facilities, and rural district hospitals. The disciplines of Family Medicine and Public Health at UKZN work closely together, creating continuity across the first three years of the programme. Fourth- and fifth-year students are based primarily at PHC clinics and in the outpatient departments of district hospital respectively. In the final year, there is a seven-week rural block where the students spend six weeks in the rural hospital as junior interns.

As with SMU, key informant interviews highlighted the complexity of DTPs, across the entire under-graduate medical education programme.

Our decentralised platforms are our clinical education platforms in the later years. Our entire fifth year program is on a decentralised platform, meaning that is away from the central or traditional clinical platforms that were Durban based. (KI 13, UKZN)

Key informants underscored critical success factors of financial and human resources, and good relationships with stakeholders, especially the provincial department of health. While investment in supervision at the DTPs and building relationships with staff at rural sites have been positive, reported challenges included high turnover of staff at some DTPs and under-investment in public health.

At WSU, the majority of DTPs consist of PHC facilities and district hospitals in rural areas. The university has invested in comfortable student accommodation on hospital premises, with the necessary infrastructure. In some hospitals, the authorities have provided student accommodation, with joint management of the accommodation, while transport in a university responsibility. Key informants highlighted the good relationships with the provincial Department of Health. Students are also encouraged to use the hospital's facilities and to interact with other professionals, mostly nursing students. Notwithstanding WSU's 20-week integrated longitudinal community clerkship, key informants highlighted the challenge of community participation and/or relationships:

In the main, it [community participation] has not yet happened. The community is aware that there are students because we would go and inform the hospital boards that there are students that will be spending some time. Even those students do outreach, so they visit the nearest clinics, but it's still within the facility. They have not yet gone out to the community. (KI 4, WSU)

At Wits University, the DTPs used were dependent on the relevant discipline, but included a mix of urban and rural sites, the latter primarily used by public health. Some key informants reported that the utilisation of PHC facilities has diminished over the years, mainly due to logistical issues. These include transport of students to clinics and getting clinic staff to teach students. In addition, the relationships with the local authority have also changed over the years.

The University has invested in the upgrading of the Wits Rural Facility (WRF) in a rural part of the Mpumalanga Province. The WRF includes comfortable staff and student accommodation, recreational facilities, as well as information technology infrastructure. Additional investments have been made in the North West Province regional hospital DTP for provision of transport, accommodation, computers, and internet connectivity. The practice of DTPs varies, depending on the relevant disciplines. One key informant explained the family medicine DTP as follows:

The primary vehicle by which we train our undergraduate medical students, is a programme called the Integrated Primary Care rotation. It hosts some 55 students spread across 12 different sites who spend a six-week rotation as one of seven blocks during their final year. (KI 9, Wits)

Key informants highlighted that there is good administrative support and good supervision at the DTPs. Stakeholder engagement was mostly with staff at the DTPs, with reportedly little engagement with actual communities.

3.7. Investments in decentralised education and training

At each university, key informants described the investments made in decentralised medical education and training. These included infrastructure (new buildings, student accommodation, libraries, etc.), information technology, and transport for students, human resources, and finances.

Key informants at all four institutions highlighted the importance of the financial investments through government grants, university investments and donor funding. This financial investment

has facilitated the joint appointment of staff between the Universities and the Department of Health at DTPs, provision of infrastructure, technology, accommodation and transport services.

Most of the human resource (faculty) investments have been in the form of joint provincial government-university appointments. This means that the provincial health department pays the salaries of the joint staff, who have an appropriate university appointment (e.g., lecturer, or professor) that allows access to university resources. Key informants questioned the sustainability of these appointments because of the relative lack of control of universities. In addition, the confusion and/or lack of clarity of the role and responsibilities of the preceptors at the DTPs could further undermine the sustainability of the DTPs. Key informants at all universities also underscored the importance of investing in relationships, especially with provincial government health departments, and for intellectual investment in DTPs.

4. Discussion

This study has generated new knowledge on the institutional context, the types, and utilisation of DTPs in undergraduate medical education at four South African universities.

All the selected universities in this study have embarked on reforms in undergraduate medical education. These reforms included the creation of specialised units to oversee and coordinate undergraduate medical education programme, the appointment of senior academics, curriculum reforms, and the expansion of DTPs. There have also been various innovations, ranging from longitudinal placements of medical students at DTPs (SMU, WSU), to an entire DCTP at UKZN and a multi-disciplinary Wits Rural Facility. These reforms have been in response to the changing context of medical education and global and national education transformation imperatives. These reforms at the four universities are encouraging and appear to respond to the WHO's vision of, and guidelines on, the transformation of health professional education to ensure that graduates are responsive to health needs (WHO, 2013).

The study found that context, notably the institutional history and evolution of DTPs and the expressed vision and philosophy of medical education, influenced the type, characteristics, and utilisation of DTPs at the four universities. Notwithstanding the reported utilisation of DTPs in all four medical education programmes, these DTPs were primarily hospital-based. At SMU, the exposure to PHC is for short periods, in part due to the small size of PHC clinics relative to the number of students, logistical issues such as transport, and safety concerns. UKZN's innovative homestay programme is a voluntary programme of short duration. The utilisation of PHC facilities is constrained by insufficient resources, and competition with the time required for the clinical disciplines. Similarly, WSU's innovative Integrated Longitudinal Community Clerkship is based at rural, district hospitals. While this is positive because of the rural exposure, relationships with communities are transient, and a PHC focus insufficient. Although Wits has utilised DTPs for more than 30 years, PHC and rural DTPs appear to be peripheral activities, rather than central to the medical education programme. The university rationale for the investment in a large regional hospital in a more rural province is the hospital's ability to serve as a DTP for more than one clinical discipline.

Our study findings suggest that hospital-based DTPs are unlikely to achieve the medical education reforms needed for UHC. This is because PHC is critical for the achievement of UHC globally (WHO, 2019) and in South Africa (Academy of Science of South Africa,, 2018). Given the relative neglect of PHC DTPs at all four universities, there must be a concerted effort to prioritise PHC, and to invest sufficiently in making PHC training a significant part of medical education. This has been done in Malaysia where faculty at Monash university introduced one year-long clerkships at public PHC clinics (Solarsh et al., 2012). Such expansion and investment in PHC DTPs will enable medical students to emerge in PHC within the context that they will practice once they graduate (Hartman, 2009).

WSU has the longest student exposure of 20 continuous weeks at rural district hospitals. However, across the four universities the medical student immersion at rural DTPs appears to be insufficient. Existing evidence, albeit from high-income countries, suggest that the development and retention of a rural medical workforce requires long-term investment and prolonged rural exposure (Bing-You et al., 2014; Denz-Penhey et al., 2005; Sen Gupta et al., 2014; Talib et al., 2013; T. Woolley et al., 2016).

At all the study sites, the curricula reviewed were not explicit on the underlying educational philosophies at the DTPs. Although the key informants' narratives emphasised responsiveness to community needs, community-based education, and social accountability, these intentions do not appear to have translated into demonstrable relationships with communities. The challenges of community-service interaction were also found in a study in Brazil that evaluated a dedicated programme to transform medical curricula in support of the needs of the national healthcare system (de Souza, Zeferino and Ros 2008).

The reported teaching on the social determinants of health at all study sites is commendable, but this is done by the public health and/or family medicine portfolios. In the case of public health, the discipline remains under-resourced, and neglected, competing for time, space and resource prioritisation. Exploring the disconnections between medical education and medical practice, Benatar and Daneman have argued that "improvement in health also requires education on disease prevention and public health, and greater emphasis on the social and societal determinants of health" (Benatar & Daneman, 2020): page 1293.

The finance, infrastructure, and human resource investments varied across the four universities and across disciplines, with the clinical disciplines as the main beneficiaries. Some key informants highlighted the importance of long-term relationships with provincial health departments, hospital managers, and staff at the DTPs. Although these investments are commendable, a study on medical schools in sub-Saharan Africa stressed the importance of ongoing investments in medical education (Mullan et al., 2011). Our study found that there were insufficient investments in community-university relationships, that were either evolving, transient, or largely absent. The experience in other countries has shown that tangible resources and shared community-university initiatives helped to develop positive and trusting collaborative relationships (Perrault et al., 2011). Hence, more efforts are needed to ensure community participation, and socially accountable medical education programmes.

The study is limited by the relatively small number of key informants interviewed. However, the people interviewed were the key policy actors at the four universities, who shape and make decisions about undergraduate medical education, and hence the universe of perspectives were captured. The study found a lack of/or insufficient written information on DTPs, which is a limitation. This revealed the relative lack of prioritisation of DTPs across the study sites. The study focused on four of the ten South African universities that provide undergraduate medical education and may not be representative of all the undergraduate medical education programmes. The units at the universities that are responsible for the coordination of the undergraduate medical education programmes have been in existence for a number of years. A specialised unit for DTPs, the joint initiative of the KwaZulu-Natal Department of Health (KZN-DOH) and UKZN's College of Health Sciences, at UKZN was established in 2016. The study provides rich insights into context, types and utilisation of DTPs at these four universities, which combined, produce more than half of the country's young doctors. The comparative case study provides lessons for similar settings in other LMICs.

The medical education reforms, including academic leadership, innovations and investments at the four universities are commendable. Nonetheless, the DTPs remain primarily hospital-based, the PHC exposure is short, transient relationships with communities exist, the education on social determinants of health is not mainstreamed and inter-professional education happens by chance. DTPs provide major opportunities for transformation of health professional education in support of South Africa's UHC reforms (Greysen et al., 2011; Hartman et al., 2012). However, this can only be

realised with effective and visionary university leadership and governance (van Schalkwyk et al., 2020).

5. Conclusion

South Africa's ambitious health sector reforms will need to be complemented by health workforce educational reforms. DTPs are an essential component of transformative medical education, and require an explicit vision, and institutional investments in human resources, finances, and infrastructure.

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Data availability statement
Data cannot be shared publicly because the study consisted of in-depth interviews with senior academics at each of the selected universities. The Human Research Ethics Committee (Medical) of the University of the Witwatersrand (contact via https://www.wits.ac.za/ethics/human-research-ethics-committee-medical) has imposed restrictions because of the confidential and sensitive nature of the data. Data are available upon request from researchers who meet the criteria for access to confidential information, to contact: Zanele Ndlovu, the Administrative Officer in the Research Office via email Zanele.Ndlovu@wits.ac.za

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4.6 Chapter Conclusion

In this chapter, we discussed the types of DTPs and how they are used in undergraduate medical education. The next chapter will discuss the use of log diaries to examine the activities students are engaged in at DTPs.

5 CHAPTER 5: Using log diaries to examine the activities of final year medical students at decentralised training platforms of four South African universities.

5.1 Publication details

Chapter five is presented as a published paper. The paper analysed how final-year medical students spend their time during the integrated primary care rotation at a DTP. Students from four South African universities logged their activities for one week, categorized into clinical, teaching, skill, community, and free time. The data revealed that students predominantly engaged in clinical activities, with minimal time dedicated to community-based activities, suggesting a need for a shift to realize the full potential of DTPs. This paper was published in the African Journal of Health Professions Education. The African Journal of Health Professions Education (AJHPE) is an online, quarterly, peer-reviewed journal that covers matters related to education for health professionals.

5.2 Journal details

Title of the Publication: Using log diaries to examine the activities of final year medical students at decentralised training platforms of four South African universities.

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5.3 Details of author contribution

The Contributor Roles Taxonomy (CRediT)[100] was used to outline the authors' contribution to the study. The full explanation of the terms is in Annexure 13.

5.3.1 Table 3:1: Details of author contribution

	Dreyer	Rispel
Conceptualisation	✔	✔
Method	✔	✔
Resources	✔	
Manuscript writing draft	✔	
Manuscript writing review and editing	✔	✔
Supervision		✔

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5.5 Published article: Using log diaries to examine the activities of final year medical students at decentralised training platforms of four South African universities.

Research

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Using log diaries to examine the activities of final-year medical students at decentralised training platforms of four South African universities

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Background. An important strategy in the transformation and scaling up of medical education is the inclusion and utilisation of decentralised training platforms (DTPs).

Objective. In light of the dearth of research on the activities of medical students at DTPs, the purpose of this study was to determine how final-year medical students spent their time during the integrated primary care (IPC) rotation at a DTP.

Methods. The study was conducted at Sefako Makgatho Health Sciences University (SMU), the University of KwaZulu-Natal (UKZN), the University of the Witwatersrand (Wits) and Walter Sisulu University (WSU). At each of the participating universities, a voluntary group of final-year medical students completed a log diary by entering all activities for a period of 1 week during the IPC rotation. The log diary contained five activity codes: clinical time teaching time, skill time, community time and free time, with each subdivided into additional categories. The data were analysed for students at each university separately, using frequencies and proportions.

Results. A total of 60 students volunteered to complete the diaries: at WSU n=21; UKZN n=11; Wits n=18; and SMU n=10. At each university, students reported that they spent large amounts of time on clinical activities: WSU=46.0%; UKZN=33.8%; Wits=29.6%; and SMU=44.1%. They reported low amounts of time spent on community-based activities: WSU 0.8%; UKZN 7.6%; Wits 6.8%; and SMU 0.0%.

Conclusion. Students reported that they spent a sizeable proportion of their time on clinical activities, while reported time spent on community-based activities was negligible. The transformation potential of DTPs will only be realised when students spend more time on community-based activities.

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The inclusion and utilisation of decentralised training platforms (DTPs) are important in the transformation and scaling-up of medical education to overcome shortages, address inequities and support universal health coverage (UHC).[1] DTPs refer to any education or learning environment outside a tertiary hospital and the main university campus, and include a primary healthcare (PHC) facility, district or regional hospital, or non-governmental or community-based organisation that is used for health professional education and training.[2] In concert with global developments, the Academy of Science of South Africa (SA) has underscored the importance of decentralised training of health professionals,[3] while several scholars have highlighted the transformational potential of DTPs in increasing medical graduate output and improving outcome competencies.[2,4] Notwithstanding an encouraging increase in the scholarly focus on DTPs,[4-7] there is a dearth of research on DTPs in SA, especially on the activities of medical students and the time spent on these activities.

Log diaries or logbooks have been used extensively in educational research to document the range of clinical exposure and learning opportunities available to undergraduate medical students, and the quality of these learning encounters.[8-16] These log diary studies have demonstrated the value of community-based education,[16] and the patient demography, clinical content and process of general practice.[10,12,13,15] However, the majority of these studies have been conducted in Australia, Canada, the UK and the USA.

In sub-Saharan Africa, very few log diary studies on undergraduate medical education could be found. As part of a larger study on medical students' and junior doctors' preparedness for the reality of practice in Mozambique, Frambach *et al.*[17] used log diaries with the junior doctors. The study found that the six junior doctors who completed the log diary highlighted the challenges that they faced in balancing the need for healthcare delivery with personal survival.[17] The methodology for the study among medical students was a survey, rather than log diaries. In SA, a 2008 log diary study examined the perceived educational value and enjoyment of a rural clinical rotation for medical students.[18] Completed by 25 medical students, the study found that well-functioning rural healthcare centres contributed to skills development required for general practice and working in resource-limited settings.[18]

We could not find published studies since 2008 that have used log diaries to examine the activities of final-year medical students at DTPs. These final-year students are expected to complete integrated primary care (IPC) rotations at various DTPs in the majority of undergraduate medical education programmes in SA. The DTPs tend to be district or small regional hospitals but include a network of PHC facilities and community-based activities. The duration of the IPC blocks varies from 6 to 12 weeks.[19] Notwithstanding minor variations, the IPC objectives are similar across the different universities, namely that final-year students can provide person-centred curative care and

develop competencies in general practice, disease prevention and health maintenance.[21,22,26]

The purpose of this study was twofold: firstly, to quantify how final-year medical students spent their time during the IPC rotation at a DTP; and secondly, to determine student perceptions of the educational value of the various activities. The study is part of a broader doctoral study that aims to analyse and compare DTPs and their utilisation in undergraduate medical education at four SA universities.

Methods

Study setting

The study was conducted at four SA universities: Walter Sisulu University (WSU) in the Eastern Cape Province; the University of KwaZulu-Natal (UKZN) in KwaZulu-Natal Province; the University of the Witwatersrand (Wits) in Gauteng Province; and the Sefako Makgatho Health Sciences University (SMU) in Gauteng Province. The study sites have been described elsewhere.[22]

Study design

This was an educational research study, comprising a quantitative analysis of the log diaries of final-year medical students at the four participating universities.

Selection of participants

The original plan was to ensure diversity for the log diary study, and to recruit a random sample of final-year medical students from a list of purposively selected DTPs used for the IPC rotation at each participating university. Prior to study commencement and to assist data collection, the principal researcher (AD) consulted extensively with academic class co-ordinators and medical student representatives at each university. The consultation revealed that the planned approach of random selection was unlikely to work in practice. Hence the approach to student selection was changed. Firstly, the principal researcher selected the period between June and October 2018 to ensure that the data collection did not interfere with student examination preparation. Secondly, the principal researcher requested medical students to volunteer to keep the log diaries during the IPC rotation. This request was sent out through the various student communication channels, and the student representatives. The principal researcher liaised with the student representatives, who agreed to distribute the request for voluntary participation, together with the contact details of the principal researcher. Following the request for voluntary study participation, interested students at each university made contact with the principal researcher.

Development of data collection instrument

Following a review of the literature, the 2001 log diary tool of Murray *et al.*[13] was adapted, as it was available in the public domain, and contained all the possible categories of student activities engaged in when completing rotations at the DTPs. We developed an electronic version of the log diary for direct uploading onto RedCap (Research Electronic Data Capture; Vanderbilt University, USA),[20] a secure, web-based application designed to support data capture for research studies. The log diary was divided into hourly activities, recording a 24-hour period. The log diary contained five activity codes, derived from the IPC learning activities: A = clinical time; B = teaching time; C = skill time; D = community time and E = free time or activities of daily living. For each of these activity codes, a further coded breakdown was recorded in the log diary. The students also had to record whether the clinical activity was supervised, and who did the supervision. In the log diary, students were requested to indicate their perceptions of the educational value of the activity, the skills acquired during the activity, a rating of activity enjoyment, and whether the skills could have been acquired in the classroom at the main campus.

The electronic diary was piloted with five final-year students at Wits University, outside the planned data collection period. The pilot identified various problems, such as the looping and repetitive nature of the information that could affect participation and the completion of the log diary. The students suggested a paper-based version of the log diary. Hence, each day was condensed to fit onto one sheet of A4 paper size. Fields that were repetitive were converted into tick boxes for ease of completion. The aim of the tick boxes was to minimise errors during recording of activities. An example of the final log diary is shown in Fig. 1.

Data collection

Once the students had volunteered for study participation, the principal researcher emailed them the study information letter and consent form. Once the consent form was returned, a copy of the log diary was forwarded electronically. At WSU, the principal researcher arranged that a printed log diary be collected from a central point at the university prior to leaving the main campus for the DTP rotation. Some students requested an electronic copy of the log diary, which was emailed to them.

Each student also received a brief set of guidelines for completing the log diary. Students were instructed to exclude the first rotation week at the DTP when completing the diary, as the first week is often used for orientation activities and is not a true reflection of the IPC rotation. The log diary focused on the 7 days of the second week, when they were requested to record their activities in the log diary.

Data analysis

The hard and electronic copies of students' log diaries were stored in a locked, secure cupboard and on a password-protected computer, respectively. Each diary was assigned a number code to prepare for analysis and to ensure confidentiality. The diaries were grouped by university to allow for comparisons. The information in the completed diaries was captured using REDCap, and then exported to Stata version 16 (StataCorp, USA) for analysis. Only descriptive analysis was conducted.

Although students used a 24-hour period to record activities, we used a 10-hour day from 08h00 to 18h00 as a typical final-year medical student day. The activity code E (free time), which includes sleeping, daily ablutions and travelling, was renamed activities of daily living. Ratings of enjoyment and educational value were analysed as continuous variables on a three-point scale: great value, some value or no value.

Ethical considerations

The Human Research Ethics Committee (HREC) Medical of the University of the Witwatersrand in Johannesburg provided ethical approval for the study (ref. no. M170704). Given the deviation from the original study protocol for the recruitment of students, the principal researcher obtained an amendment from the Wits HREC. All ethical guidelines were adhered

PAPER VERSION OF LOG DIARY

Date: _____ Day: _____ of Week:_____

Time	Activity Code. A: Clinical time B: Teaching time C: Skill time D: Community time E: Free time	Type of activity **A: Clinical Time** A1= Ward rounds A2= Seeing patients in clinic/ health centre/OPD A3= Performing medical procedure A4= Assisting in theatre A5= On Call A6= Other Clinical activity **B: Teaching Time** B1= Teaching activity B2=Attending seminar/ meeting B3= Contact with lecturer/ staff at main campus B4= Self-directed learning [e.g. reading, study, assignment/computer-assisted learning/discussion with fellow students] B5= Teaching by preceptor/tutor. B6= Teaching by other staff, e.g. doctor, nurses, community health worker, physiotherapist, etc. B7= Study/Reading **C: Skill Time** C1= Practising a skill **D: Community Time** D1= Mobile clinic D2= Home visits D3= Visiting NGO or Community Organisation D4= School visit D5= Attending community event D6= Organised social activity **E: Free Time** E1= Non-educational/recreation/free/sleep time E2= Shopping/cleaning E3= Travelling time (including time spent waiting) E4= Waiting for clinical activity/teaching/skill E5= Other [please specify]	Was this activity supervised? • *Only for clinical activities*	Supervised by who? E.g., Doctor, Nurse, Preceptor/ Tutor, Community Health Worker, etc. • *Only for clinical activities*	Your rating of Educational value. Rate 1-3 1= no value 2= some value 3= great value • *Only for clinical/teaching/ skill/community activities*	Code Skills acquired during this activity P= Procedural Skill A= Advocacy D= Decision Making S= Problem Solving C= Communication CA= Cultural Awareness T= Theoretical Skill N= No skill acquired	Your rating of Enjoyment value. Rate 1-3 1= not enjoyed 2= did enjoy 3= enjoyed very much • *Only for clinical/teaching/skill/community activities*	Could the skills have been acquired in the classroom at main campus?
6:00 – 7:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
7:00 – 8:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
8:00 – 9:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
9:00 – 10:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
10:00 – 11:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
11:00 – 12:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
12:00 – 13:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
13:00 – 14:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
14:00 – 15:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
15:00 – 16:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
16:00 – 17:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
17:00 – 18:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
18:00 – 19:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
19:00 – 20:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
20:00 – 21:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
21:00 – 22:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
22:00 – 23:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
23:00 – 00:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
00:00 – 01:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
01:00 – 02:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
02:00 – 03:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
03:00 – 04:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
04:00 – 05:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No
05:00 – 06:00			☐Yes ☐ No		☐1 ☐2 ☐3	☐P ☐A ☐D ☐S ☐C ☐CA ☐ T ☐No Skill	☐1 ☐2 ☐3	☐Yes ☐ No

Complete 1 sheet per day for 7 days. Completed forms to Abigail.Dreyer@wits.ac.za or 0740845481.

Fig. 1. Log diary for medical students' activities.

to, including a detailed information sheet, informed consent, voluntary participation, confidentiality and anonymity of respondents.

Results

Background characteristics

Across the four universities, 60 students volunteered to complete the diaries: 21 students from WSU (1 female, 20 male); 11 students from UKZN (8 female, 3 male); 18 students from Wits (8 female, 10 male); and 10 students from SMU (4 female, 6 male). During the data collection period, UKZN and SMU experienced student protests, resulting in five incomplete diaries from UKZN and six incomplete diaries from SMU that were excluded from analysis.

The 60 students were spread across 32 different sites, which included three PHC facilities and 24 sites in rural settings. As per the log diary

guidelines, 26 students completed the log diaries in the second week of the IPC rotation, with the remainder in weeks 3, 4 and 6, respectively.

Time spent on each activity

Fig. 2 shows the proportion of student time spent on the five categories on the log diary form. The clinical activities at the DTPs ranged from 29.6% at Wits to 46.0% at WSU. Clinical activities included assisting in theatre, performing medical procedures and ward rounds. The students indicated that the majority of clinical activities were supervised, ranging from 88.2% at UKZN to 99.5% at WSU. Medical doctors supervised the clinical activities in the majority (85.9%) of instances, although other categories of health professionals also assisted with supervision.

Teaching time included attending a seminar/meeting, teaching by a preceptor, teaching by other staff, contact with main campus, self-directed learning, and reading or study. Time spent on teaching ranged from 19.4% at WSU to 31.7% at Wits. Students recorded low amounts of time on skill acquisition. Similarly, students recorded low amounts of time spent in the community, ranging from no time at SMU to 7.6% at UKZN.

Fig. 2 shows that at all four universities, students indicated that they spent similar proportions of time on activities of daily living, namely travelling, waiting, cooking, eating or shopping.

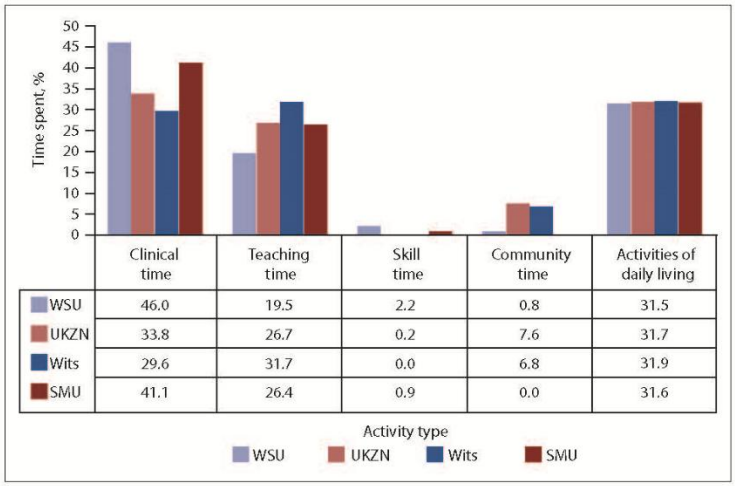


Fig. 2. Student records of activities and time spent at decentralised training platforms, by university. (WSU = Walter Sisulu University; UKZN = University of KwaZulu-Natal; Wits = University of the Witwatersrand; SMU = Sefako Makgatho Health Sciences University.)

Table 1. Students' rating of educational value of clinical and educational activities at DTPs

Activity type	WSU	UKZN	Wits	SMU
Clinical				
Students, *n*	21	11	18	10
Activities with great value, *n* (%)	204 (50.7)	87 (48.3)	28 (14.4)	76 (46.1)
Activities with some value, *n* (%)	198 (49.3)	80 (44.4)	166 (85.6)	89 (53.9)
Activities with no value, *n* (%)	-	13 (7.3)	-	-
Total activities rated, *n*	402	180	194	165
Educational				
Students, *n*	18	10	18	10
Activities with great value, *n* (%)	141(60.3)	38 (27.3)	24 (9.6)	28 (43.8)
Activities with some value, *n* (%)	93 (39.7)	97 (69.8)	222 (89.5)	36 (56.2)
Activities with no value, *n* (%)	-	4 (2.9)	2 (0.9)	-
Total activities rated, *n*	234	139	248	64

DTP =decentralised training platform; WSU = Walter Sisulu University; UKZN = University of KwaZulu-Natal; Wits = University of the Witwatersrand; SMU = Sefako Makgatho Health Sciences University.

Perceived educational value

Notwithstanding clear guidelines on rating of the educational value of the various activities during their IPC rotation, the majority of the students rated the clinical and educational activities. In light of the missing data on skill and/or community activities, Table 1 only focuses on their rating of clinical and educational activities.

Table 1 shows that there were variations in the students' ratings of the value of the clinical activities. Across the four universities, UKZN was the only university where students rated 6.1% of the clinical activities to be of no value. Students' rating of clinical activities of great value ranged from a low of 14.4% at Wits, to a high of 50.7% at WSU.

In terms of educational activities, four students at UKZN (2.9%) and two at Wits (1%) rated these activities as having no value. Their rating of educational activities of great value ranged from a low of 9.7% at Wits, to a high of 60.3% at WSU.

Discussion

This study used log diaries with a voluntary group of final-year medical students to measure the proportion of time spent on each of five pre-determined categories of activities at the DTPs of four SA universities.

The study found that there were variations in the time spent on clinical activities, from 29.6% at Wits to 46% at WSU. We could not find similar studies focusing on medical student activities in other low- and middle-income settings. Although not directly comparable, Worley *et al.*[16] found that patient contact (i.e. clinical activities) in Canada was higher when students were based at community sites than when students were based at secondary or tertiary hospitals. Encouragingly, the participating students reported adequate supervision of the clinical activities. Mubuuke *et al.*[23] have highlighted the importance of adequate supervision to the professional growth of undergraduate medical students.

Across the four universities, the majority of students reported that the clinical activities were of some or high value. At WSU, slightly more than half of students (50.7%) rated the clinical activities as of high value, similar to the ratings of students at SMU (46.1%) and UKZN (48%). In contrast, only 14.4% of the Wits students rated the clinical activities as of high value. A 2019 Wits study that examined final-year medical students' ratings of service-learning activities during an IPC block found that students reported positively on the educational value of the majority of

clinical activities.[19] However, the 2019 study used a different methodology to the present study, and this might account for the differences in findings. The higher student ratings at the three universities compared with Wits could be due to a more established clinical focus in the programme offered at Wits. As our study was conducted among a voluntary group of students at each of the four universities, further research is needed to determine whether there are significant differences across different universities, and the factors that influence these differences.

In this study, students indicated that they spent between 19.5% (WSU) and 31.7% (Wits) of their time on teaching activities at the DTPs. The teaching time included self-directed learning, which would be expected of final-year medical students, as they are on the cusp of entering the medical profession. The variations in the time spent on educational activities across the four universities might be a reflection of the actual DTPs. Our study could not determine the proportion of time spent on self-directed learning. However, a University of Pretoria study[24] among fifth-year medical students found that these students reported high amounts of time on self-directed learning, which led to a review of the assumptions about the importance of formal teaching. The majority of students in the present study rated the educational activities as of high or some value. Similar to the rating of clinical activities, a minority of Wits students (9.7%) rated the educational activities as of high value, compared with the majority at WSU (60.3%). Further research is needed to elicit the reasons for these inter-student and inter-university variations.

Students indicated that they spent very little time on practising or learning new skills. These skills include clinical, communication, decision-making, problem-solving and advocacy skills. The small proportion of time spent on such skills might be because of the emphasis placed on clinical skills training in the years leading up to the final year. A study[25] among students from the Ukwanda Rural Clinical School at Stellenbosch University identified improved confidence in their clinical skills and decision-making skills linked to their placement at the rural DTPs. The low proportion of time spent on skills might be a function of the week in which the diary was completed, the lack of opportunities available to the students, and/or the characteristics of the DTP. Nonetheless, it is a missed learning opportunity that students were not able to learn or practise a range of skills, including advocacy skills, at the DTPs. Advocacy is an essential undergraduate health professional competency in the health system context of working in rural and other under-served areas in SA,[21] and addressing the shortages of health personnel in rural areas.[25,27]

At SMU, students recorded that they spent no time on community activities, which include home visits and health promotion activities. Similarly, at WSU, students recorded that they spent less than 1% of their time on community activities, while Wits and UKZN students recorded that they spent 6.8% and 7% of their time, respectively, on community activities. This is of great concern, as the transformation potential of DTPs lies in immersion and exposure to communities, developing relationships with communities, learning about the social determinants of health, encouraging students to return to rural and underserved areas and to have a greater commitment to social accountability.[23,28-30]

Further research is needed to determine whether and why so little time was reportedly spent on PHC and community-based activities during the IPC rotation. Across all four universities, students recorded that they spent almost one-third of their time on activities of daily living. While this might reflect the nature of the DTPs, the findings suggest that there is potential to reorient the IPC rotation toward PHC and community-based activities.

Study limitations and strengths

Despite extensive efforts to achieve a representative group of final-year medical students at each university, the study is limited by the volunteer sample of 60 final-year medical students. At both SMU and UKZN, student participation was affected by the prolonged protests during 2018. These student volunteers who completed the log diaries are likely to differ from other students. Hence, the study findings are not generalisable to other final-year medical students. Notwithstanding careful guidelines for data entry, and regular follow-up with students, the missing information is a major limitation, especially in terms of gauging the educational value of the few reported community activities.

Nonetheless, there are several strengths to the study. The methodology of log diaries is innovative in capturing the activities and time spent at DTPs. The method allows for accurate recall of activities and ensures confidentiality and anonymity of participants. The log diary entries have generated new knowledge on the activities of medical students during the IPC rotation, such as the bias towards clinical activities and a relative absence of community exposure or immersion. This knowledge is important because medical doctor shortages in PHC and in rural and underserved areas remain acute yet are critical to overcome to achieve UHC and the goals of the proposed national health insurance system in SA.[31]

The lessons for future log diary studies are careful preparation, extensive consultation with and orientation of students prior to data collection, and possible daily submission of completed log diaries to pick up missing data at an early stage. Direct entry using mobile phone technology should also be explored.

Conclusion

This log diary study set out to quantify how final-year medical students spent their time during the IPC rotation at a DTP, and to determine student perceptions of the educational value of the various activities. Students reported that they spent a sizeable proportion of their time on clinical activities, while reported time spent on community-based activities was negligible. The bias toward clinical activities was also shown by students' completed ratings of the educational value of these activities, while the few community-based activities were left unrated. The policy implication of the study findings is that the transformation potential of DTPs in undergraduate medical education will only be realised when there is prioritisation of PHC and community-based activities.

Declaration. None.

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Author contributions. AD – conceptualisation of study, protocol development, data collection, data analysis and interpretation and writing of article; LCR – supervisor for the study and contributed to conceptualisation, development, analysis and interpretation, as well as critical evaluation and final approval of the manuscript.

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Conflicts of interest. None.

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5.6 Chapter Conclusion

In this chapter, we analysed how final-year medical students spend their time during the integrated primary care rotation at a DTP. The next chapter will discuss the student experiences of learning at DTPs.

6 CHAPTER 6: Context, Curriculum and Competencies: Final year undergraduate medical students' experiences at decentralised training platforms.

6.1 Manuscript details

Chapter six is presented as a manuscript structured according to the journal guidelines. The paper was submitted to the Discover Education journal, and we are working on post-review feedback. *Discover Education* is an open access journal publishing research from a broad range of education fields with the potential to impact social and academic development. The paper explored student experiences at DTPs during their final year rotations. The manuscript's title is *Context, Curriculum and Competencies: Final year undergraduate medical students' experiences at decentralised training platforms.*

Journal: Discover Education

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ISI accredited

Impact factor: 0.560

6.2 Details of author contribution

The Contributor Roles Taxonomy (CRediT)[100] was used to outline the authors' contribution to the study. The full explanation of the terms is in Annexure 13.

6.2.1 Table 3:1: Details of author contribution

	Dreyer	Rispel
Conceptualisation	✔	✔
Method	✔	✔
Resources	✔	
Manuscript writing draft	✔	
Manuscript writing review and editing	✔	
Supervision		✔

6.3 Submitted article to Journal for review

6.3.1 Abstract

Background: South Africa is focusing on restructuring health professions education and exposure to underserved communities as a necessary curriculum reform. Research has shown the importance of qualitative methodologies in understanding students' perspectives on the curriculum and community-based education and suitable teaching to help students achieve a better understanding of the patient and their healthcare goals.

Aim: To explore medical students' experiences, facilitators and barriers related to teaching and learning at these DTPs.

Setting: The study recruited thirty-eight final-year medical students from the four selected universities.

Methods: The study employed an exploratory approach, utilising qualitative data-collection methods through focus group discussions (FGDs) to gather a comprehensive and detailed set of information. The transcripts and audiotapes were examined using inductive and deductive topic analysis. The open coding process created a comprehensive set of codes based on the data. These codes were subsequently organized into groups and further refined into themes. **Results:** Direct patient interaction enhances communication skills, empathy, and understanding of patient needs. Real-life patient scenarios promote critical thinking and problem-solving. Clinical rotations provide valuable insights for healthcare workers, preparing them to master patient care and the healthcare system.

Conclusion: Although clinical activities are necessary, community-based experiences offer a comprehensive understanding of patient care, public health, and the socioeconomic factors influencing health outcomes. Community-based experiences provide a comprehensive understanding of patient care, public health, and socioeconomic factors influencing health outcomes. Balancing clinical practice and community participation is crucial for cultivating skilled physicians. Participation enhances education, and fosters social responsibility, and empathy toward diverse needs.

Keywords: final-year, medical students, experiences, learning environment, decentralised training platforms, South Africa

6.3.2 Introduction

Global perspectives maintain that the importance of human resources management (HRM) is critical in providing quality health care delivery and improving overall patient health outcomes. The COVID-19 pandemic has underscored the criticality of human resources for health (HRH) to health care delivery, health system resilience, and population health outcomes [1, 2]. At the same time, the pandemic has exacerbated the global HRH crisis, characterised by under-investment, resource shortages, maldistribution and inequities among and within countries, and inadequate and unsafe work environments [3, 4].

In May 2021, the 74th World Health Assembly resolution called for HRH investments, including acceleration of health workforce education [5]. However, such education should be reoriented to ensure the deployment and retention of health professional graduates in rural

and other underserved areas [6]. Health workforce education should also ensure that graduates have the right competencies to meet the health and targeted student admission policies, revised curricula and distributed or decentralised training platforms (DTPs)[6]. These DTPs exclude highly specialised tertiary hospitals and are situated away from the main university campus, commonly embedded in and linked to communities [7]. In the preceding decade, DTPs have gained traction and have been expanded in countries like Australia and Canada [8-10]. The goal of these DTPs is to increase student enrolment and to encourage doctors to practise in under-served area, thereby achieving a more equitable distribution of HRH.

There is a substantial literature on the importance of the learning environment in health professions education[11-18]. These studies capture the student perspectives of how the learning environment supports the construction of knowledge, the professional identity and professional skills essential to their future profession. The learning environment refers to "*the physical, pedagogical, and psychosocial contexts in which learning occurs*" [19]: page 290. Evidence suggests that there is a positive relationship between a supportive learning environment and student well-being, values, identity, academic success and subsequent professional practice [18-21].

The restructuring of health professions education, particularly medical education, continues to be a top focus in South Africa[22]. There are still significant disparities in the distribution of medical personnel between urban and rural areas as well as between the public and commercial health sectors, notwithstanding democratic transformation measures that are encouraging [22]. The selection of medical students, the curriculum, the exposure to and experience of DTPs in underserved communities, and other variables all contribute to these discrepancies [23].

The perceptions of medical students toward the educational environment have been the subject of several South African research studies [15, 24]. This research has shown the significance of qualitative methodologies for learning about students' perspectives on the curriculum [25]. The perceptions of medical students on community-based education have been examined in these studies [11] as well as their plans to return to the areas that the DTPs serve after graduation [26]. In a related study [27], it was discovered that student interaction and representation helped students from rural backgrounds achieve their healthcare goals. Studies have also concentrated on the curriculum areas that require attention, emphasising elements like standardising the assessment, student support systems, and suitable teaching [25].

While many studies shared experiences of students while completing clerkships at district hospitals and primary care clinics, these were single university experiences [15, 24, 26, 28]. There were few comparative studies that looked at medical student experiences at DTPs across multiple universities [29, 30]. This study aims to address this limitation through the use of qualitative data on medical student experiences, facilitators and barriers related to teaching and learning at these DTPs. Nested in a broader doctoral study, this study contributes to generating new knowledge on the utilisation and transformative role of DTPs in undergraduate medical education by the health science faculties of four South African universities.

6.3.3 Methods

6.3.3.1 Conceptual framework

For the study, an adapted analytical framework was used that drew on the work of early pragmatist philosophers C.S. Peirce and John Dewey, the Community of Inquiry [31]. The COI framework presents a social constructivist process model that defines, describes and measures three principle elements namely the social presence, cognitive presence and teaching presence.

Stufflebeam's Context, Input, Process, and Product (CIPP) evaluation model was used in conjunction with the COI as it systematically guides the conception, design, implementation, and assessment of learning projects, and provides feedback of the effectiveness [32]. In conjunction, the CIPP model can be used to evaluate the effectiveness of a program or curriculum, while the COI model ensures that the learning environment promotes active participation and meaningful dialogue. This combination allows for both structured evaluation and dynamic interaction, making it ideal for educational settings or collaborative projects. This conceptual framework therefore facilitates decision-making for educational improvement in this context.

Figure 1 represents the CIPP evaluation model as indicators used to categorise the data for analysis.

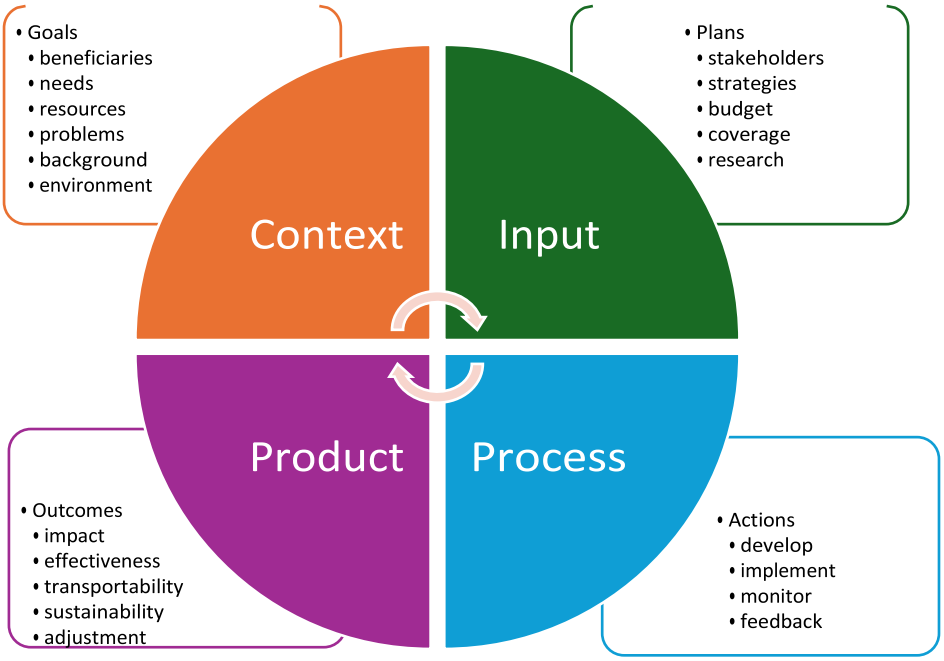


Figure 1: CIPP Evaluation model developed by Daniel Stufflebeam

6.3.3.2 Study setting

The study recruited thirty-eight final-year medical students the four purposively selected universities namely, Sefako Makgato University (SMU), the University of KwaZulu-Natal (UKZN), Walter Sisulu University (WSU) and the University the Witwatersrand (Wits). These universities are located in three South African provinces. Refer to Table 1 for an overview of the shared characteristics that form the study setting.

Table 1: Overview of Study Setting Characteristics

Characteristic	SMU	UKZN	WSU	Wits

Provincial location	Gauteng	KwaZulu Natal	Eastern Cape	Gauteng
Size of the provincial population*	15 176 116 (25.8%)	11 289 086 (19.2%)	6 712 276 (11.4%)	15 176 116 (25.8%)
Urban-rural population distribution	Urban 97.2% Rural 2.8%	Urban 46.0% Rural 54.0%	Urban 38.8% Rural 61.2%	Urban 97.2% Rural 2.8%

* Statistics South Africa: Mid-year Population Estimates 2019(STATS SA 2019)

6.3.3.3 Design

The study was guided by an exploratory, qualitative data-collection method using focus group discussions (FGDs) to provide a rich source of information. Focus group discussions are a valuable method for collecting data from students due to their ability to foster interaction, explore diverse perspectives, and provide rich, qualitative insights. FGDs were conducted in person. The researchers designed this study to triangulate the data collected within a larger study aimed at gaining a better understanding of the ways DTPs are used in the undergraduate training of medical students. Final year medical students from SMU, UKZN, WSU and Wits, were invited to participate in the FGDs. This provided representational data from the universities located in three South African provinces.

6.3.3.4 Recruitment and participant selection

Participation in the FGDs was voluntary. An invitation to participate was sent via email to the medical student council, and the final year class representatives at the respective institutions. Following the request for voluntary study participation, participants at each university confirmed their interest with the principal researcher (AD) via email.

After volunteering to participate, participants received an information sheet and consent form through email. The researcher sent the participants an email with the time and location of the focus groups. To accommodate the time schedules of participants and their locations, three options were provided to conduct the FGDs. The agreed time and location considered the academic schedule to support minimal interruption for the participants. FGDs were audio-recorded and transcribed for analysis.

6.3.3.5 The FGD guide

According to recommended focus group methodology[19], a semi-structured question guide (see Table 2) was developed by the research team. Questions for the FGD were constructed to illicit the student experiences across the undergraduate training, paying attention to the facilitating or constraining factors related to teaching and learning at DTPs. Questions also probed for possible solutions or interventions needed for curricula transformations and encouraged participants for suggestions for changes they identified as feasible. Each question was asked as a guide to discussion on the topic, where the facilitator encouraged discussion with probing questions and requests for elaboration around the questions. Questions remained consistent for both focus groups. Participants were guided through these questions to explore several issues related to their experiences at the DTPs. These included the practicalities, timing, what they took from the experience, and how it benefitted their learning and contributed to the development of their professional identity. During the FGDs the researcher followed the question guide, asking additional probing questions to obtain more in-depth information about the topics and showed enough

flexibility to allow open discussions between participants. Trustworthiness of data was established by comparing responses from the focus groups from each university.

Table 2: Focus group question guide

Question type	Question
Opening	1. What are the positive aspects of being a medical student at. a. Named university? b. In South Africa? 2. What are the main challenges faced by medical students in South Africa?
Introduction	3. During the course of your undergraduate studies, you have been to a number of the decentralised training platforms that the university makes use of. Is that correct? 4. How many have you been to, and can you describe to me your experience at these sites?
Transition	1. Please tell us about the teaching and learning that happens at these DTPs. i. What types of teaching and learning activities are you engaged in? ii. In your opinion, how do the learning activities contribute to you becoming a competent graduate (probe skills acquired, knowledge learned)? iii. How would you describe the culture of teaching and learning? iv. Compared to your experience at large central or regional hospitals, what are your views on the teaching and learning activities at the DTPs v. Do you provide formal evaluation of your placement at DTPs? vi. What would you say is the educational value of the DTPs? 2. In your view, what are the benefits of training medical students in a DTP? i. What do you gain from the experience? ii. In your opinion, what is the role in, or contribution of DTPs to, transforming medical education?
Key	7. From your perspective as student, could you tell us about any innovations/good practices at the different DTPs that you have been to? 8. Is there any DTP that stands out? Why is that the case? 9. Could you tell us about the challenges or constraints that you experience at the different DTPs?
Ending	10. Is there anything else you would like to say about DTPs used by [name] University/ department/School, and their contribution to your education? 11. What are your recommendations for changing the under-graduate medical curriculum, with particular focus on DTPs: a. At this [named] University b. In South Africa as a whole?

6.3.3.6 Data Analysis

Transcripts and audiotapes were analysed using a combination of inductive and deductive thematic analysis. For analysis, the conceptual framework was used to categorise the responses as either related to content or process-related aspects of the DTPs as outlined in

Table 3. All the data was analysed and coded by the authors and an independent researcher. The additional themes emerging from the data, i.e., inductive coding, were extracted through listening and assessing the auditory clues and oral context of the discussion [33].

Each of the focus groups transcripts were reviewed multiple times; first for familiarity, second to code transcripts for content and thirdly to classify themes. The open coding generated a list of codes from the data, which was then refined into categories and then into themes [34]. The authors reviewed this work for consistency and trustworthiness. Consensus on the themes was reached between the authors.

Table 3: Categorisation according to Conceptual Framework

	Content-Related	Process-Related
1	Curriculum structure Types of sites used	5 Curriculum and the use of DTPs at institutions
2	Skill development	6 Learning competencies achieved at the DTPs
3	Site related matters Student expression of experience	7 Description of the experience of learning at DTPs
4	Feelings expressed by students about the experience	8 Development of professional identity and reflection 9 Reflection of how experience has contributed to identity

6.3.3.7 Ethical considerations

The Human Research Ethics Committee (HREC) Medical of the University of the Witwatersrand in Johannesburg granted ethical approval for the study (M170704). Using the ethical approval certificate, special gatekeeper permissions were obtained from the universities to grant permission to make contact with the student population for the study. The signed consent forms were collected at the FGDs by the researcher. All ethical guidelines were adhered to including a detailed information sheet, informed consent, voluntary participation, anonymity of respondents and ensuring confidentiality of information. Trustworthiness in this study was crucial for its credibility, accuracy, and applicability. It was achieved through data collection techniques that addressed rigor and reliability.

Credibility involved ensuring the study accurately represented participants' perspectives on the experiences being studied. Strategies included triangulation, member checking, and ensuring the findings could be applied to other contexts and institutions. Dependability was ensured through the consistency of findings over time and across conditions. Confirmability ensured that the findings were shaped by participants' experiences rather than the researcher bias. Authenticity involved the deliberate inclusion of diverse perspectives from the undergraduate students ensuring that their voices and experiences were the focus in the findings. By addressing the trustworthiness of this study, the results are reliable and meaningful to participants and the wider health professional audience of educators.

6.3.4 Results

Thirty-eight individuals participated in five focus groups. All participants were final year students. No demographic data other than gender was recorded. The majority of participants were female (n = 24).

Table 4: Focus Group Composition

Focus Group	Number of Participants	Gender	Relationship
1 SMU University	7	5 females and 2 males	Peers: all known to each other. All Unknown to researcher.
2 SMU University	8	4 females and 4 males	Peers: all known to each other. All Unknown to researcher.
3UKZN University	10	8 females and 2 males	Peers: all known to each other. Mixture of known by researcher from joint seminars and external assessments in first and second year of study.
4 WSU University	7	4 females and 3 males	Peers: all known to each other. All Unknown to researcher.
5 Wits University	6	3 females and 3 males	Peers: all known to each other. Mixture of known from first- and second-year interactions with researcher.

The themes connect to the CIPP evaluation model indicators and the themes and the corresponding sub-themes that were identified and constructed by careful analysis from the study are illustrated in Figure 2 below.

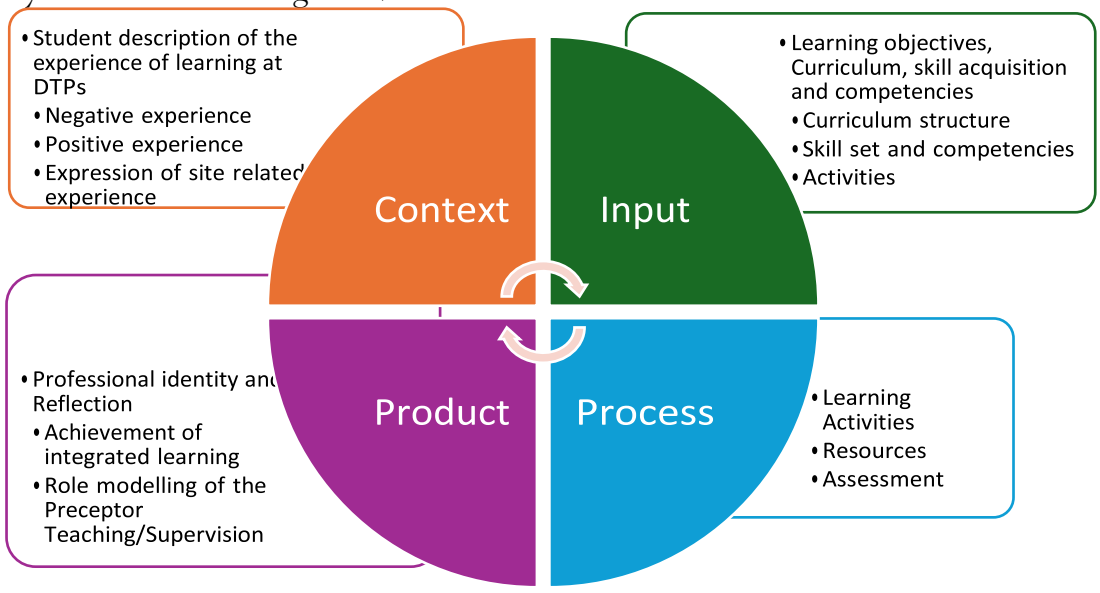


Figure 2: Thematic map

The themes and sub-themes are discussed in the paragraphs which follow, with narratives to highlight the participants' voices.

6.3.4.1 Context: The student description of the experience of learning at DTPs

This sub theme described, the negative and positive expressions of the experience by participants and the expression of the site related matters that affected the learning experience. Students reported that their experience at the DTPs uncovered their own need for support from their respective institutions.

> *"Yes, and then when they're doing that now, like somebody that knows which sites we are going to. I mean, if you knew there were problems there all you had to say, yes, this is the problem. Maybe you'll be trying but then we'll do our best as well."* (Female, Student FG UKZN)

> *"I think also, I think the people that, if you are doing a decentralised programme, the preceptors or the doctors or whoever that is responsible for you, they must have a clear picture on what you are there to do. Because sometimes, as in our case, we will be treated as we are here to complement the staff as we are here to learn. In our case we learnt a lot in terms of doing but there was lack of supervision, as my colleague has said. That if you are doing such a programme you need to make sure that it's equally everywhere. If they in Butterworth they have five visits to make sure at all other hospitals they get same treatment so that our learning, one person mustn't feel like they are disadvantaged..."* (Male, Student FG WSU)

> *"So our hospital is like a black hole, literally, so no connection. So literally the only thing we could use was Wi-Fi, and we had to now get our own...we weren't even told that only Vodacom was there. So we went there with MTN, and we're sitting there with no reception for the ward round, and now your entire assignments are online. So we there...how are we supposed to do this?"* (Female, Student FG UKZN)

Other feelings such as being overwhelmed and uncertain were negative feelings expressed. Negative feelings included that student often felt confused when out at the site as well as depressed and exhausted.

> *"I think for me I can concur a bit with what M is saying in terms of it being confusing. Every...like I feel like with every block that we go to, there's so much that's expected of you, and sometimes you feel as though you're not competent enough to do what they expect you to do. Especially when you're dealing with a patient. It's different when they're teaching you here at school and taking you through everything, but if you like throw me into the dungeon and you're like, now you need to do this, it's very stressful, personally."* (Female, Student FG 1 SMU)

In contrast to these negative experiences, some students experienced the feeling of being treated like a doctor as positive. This added to their enjoyment at the site.

> *"You also staff because you need to show up and do things. They will know that...this person was supposed to do this."* (Female, Student FG UKZN)

> *"... So, there you get a feel of what it's like to be a doctor, you have your own consultation room. You get to decide, okay, this patient comes and then this is what they have, so what would you do? But you also have doctors there that guide you and you consult, okay, I'm having trouble with this one, how do I approach it? So, it was a nice learning experience, preparing one for internship."* (Female, Student FG 2 SMU)

> *"We ran the clinic. (laughter)"* (Male, Student FG 2 SMU)

The participants described the site related matters impacting on the student attitude and learning. Logistics, resources and the living conditions were also described as impacting on whether the overall experience was positive or negative.

"*...I think it also goes back to our attitude as well, like the willingness to...must I say, to learn. Because sometimes, like you're just thrown in the forest that you must just come out, you know, victorious regardless of the circumstances that you are in. In most cases I'm too forward, and that's what mostly helps me, because even if you see that this person is not really interested, you know, in helping us...I mean, in teaching us, and then like the primary objective of me leaving this place is that I must be taught, so it*
means I must be after them. Although it is not, like...I'm not supposed to be doing that, but I must survive and..." (Female, Student FG 2 SMU)

Most of the negative experiences were linked to the student living conditions and limited resources.

"*And there's also a lot of unlearning, because all the stuff that I trained for IPC, I was trained at a tertiary or quaternary level. And here am I in my primary health care situation, I don't have resources, they're always telling me we don't have money, and I don't know how to think in a way where I work with what I have.*" (Female, Student FG Wits)

"*So I believe if you have to talk about resources and learning it will be in the sense to say, maybe as students it may be a disadvantage in the sense to say that, you may not get the opportunity to perfect those skills. But when it comes to working and being employed and all of that, I really, really agree with what they are saying, you know; when you don't have what you don't have, you have to make a plan of what to do, you understand, and that is the part that is more nicer in the sense that you learn to work in a resource limited environment.*" (Male, Student FG1 SMU)

"*Also, we had only one refrigerator and we were like eight, and guys who are needing to buy their own food and it couldn't fit there, you know. And the problem of living with too many people. It always became a problem because we shared everything.*" (Male, Student FG 2 SMU)

"*...And something so simple as, like I remember in physiology they taught us how to draw blood. And there was a vacutainer, and all of these things, and when you went to hospital there were none of these.*" (Female, Student FG Wits)

6.3.4.2 Input: Learning objectives, Curriculum, skill acquisition and competencies

Students experienced the curriculum as inconsistent both within and across sites regardless of the institution they attend. This lack of alignment vertically and horizontally within in the various sites was highlighted in terms of statements related to curriculum structure, activities and competencies. The first sub-theme explored the way in which the curriculum is structured to support the use of DTP sites.

The curriculum structure with reference to the year of study, the length of stay at the sites, the curriculum and clear learning objectives, experiences reflected that there was varied experiences across the institutions with regard to how this was structured in the schedule/logbooks and variations in the expectations between blocks existed. Participants highlighted that even though scheduled activities in the logbooks were indicated there was variation in the expectations across the blocks and lack of clear learning objectives.

"*... I think it's also reflected in how they assess our progress and during that block. So, them using a logbook is having a set of objectives that you must have achieved, that you must have done this many procedures, you must have seen this many patients, you must have done this and that and that. All of that has changed now, especially with the additional Cuban trained students now. So, which means that they're already in a training site and I'm not sure if the system is ready to acknowledge such a big number of students. Because now in orthopaedics we were told, okay, it's fine...there was some space because there are so many of you, it's fine, just do one, two or three of that procedure and that should be fine.*" (Male student FG Wits)

"*I would like teaching materials for students also. And then taking examples from first year...there were some departments where there wasn't books or manuals prepared for us, that we can sort of show them to the doctors in terms of this is what we're supposed to learn, etc., etc. So, I think making sure that the students leave with maximum teaching reading material for all the courses or all the rotations they're supposed to go through.*" (Male, Student FG WSU)

Finally, the sub-theme related to the skill set and competencies acquired during the learning experience. The participants felt that the time spent at DTPs provided opportunities for students to acquire and practice the necessary skills for their degree regardless of the time spent at sites. Participants perceived major development in their clinical skills when out at the DTPs. The competent delivery of clinical teaching skills by facilitators at the sites were highlighted and the facilitators' ability to facilitate students learning was noted. Although the skills were often centred around a health condition, the practice of the skills could be executed with a system focus and biopsychosocial approach. Participants reported that there was an opportunity to develop skills related to the effective interaction with patients, better patient management and addressing patient needs. Participants also indicated the recognition that patients trusted students for the delivery of their care. Other skills that related to the personal development of the students were noted and an improvement in how they communicated with peers.

Participants highlighted that this holistic approach and the communication skill development contributed to a great sense of achievement from the learning experience.

"*Instead of treating the patient like a human being and how you would ideally treat them in a hospital setting. You'd rather just rush everything, so you have all the information, so that when the doctor does come, and you present to them you're not put on the spot feeling like you know nothing. And it's not a nice way to learn when you have to force yourself to finish in a short space of time and then you compromise patient care. Ja. And I mean, that's not the lesson or the teaching around delivering quality care, if it's compromising that in the first place.*"
(Female, Student FG Wits)

"*... I came here to do medicine because I really loved it. And then me loving medicine made me, you know, be able to be more stronger, more helpful and more...so ja, I think it's because I've really grown in loving this thing, and it makes it easier for me to go on there and also apply my skills and apply the knowledge that I have. Because at the end of the day it was something that I really fought for to get into, and then when I got it, it was something that I told myself that I will put all my work into it and to develop myself, so that's developing my brain so that I can also help other people outside.*" (Male, Student FG 2 SMU)

6.3.4.3 Process Indicators

The sub theme that was identified and constructed by careful analysis from the data, related to activities that students engaged in during their DTPs. These included unscheduled holiday work, health promotion activities and health and environmental systems related activities. Participants indicated that the emphasis on development of clinical and procedural skills within a healthcare facility was consistent across the years of study.

> *"You can see as you go, like something that's proper, like how every year they add on to what you know and they expect you to know what you've learnt throughout the year, then to it too, until you're in final year then you can use all the skills in one hospital."* (Male, Student FG 1 SMU)

The participants recalled that across the programmes several different sites were used during the course of their undergraduate programmes. The sites where students were expected to work in a combination of primary health care clinics and district level hospitals enabled them to conduct community work compared to sites where a hospital-based approach was used.

> *"...And we either went to Alex or Hillbrow, right. So, it was part of like our sociology training where we were sent to these sites and then basically, we were given a brief outlook of like what it's like in that community, what are the things that they're faced with, and what are the programmes that are running there, what are the challenges that they experience there as well."*
>
> (Female, Student FG Wits)

> *"...one block going to a hospital it's like virtually twelve and fifteen hospitals."*
>
> (Female, Student FG UKZN)

With these activities, participants referred to the work they were required to do in primary health care clinic and within other community sites. They commented on the frequency and organisation of these activities.

> *"Here we sometimes go to what is called an outreach, we go to a nearby clinic with other doctors. But we only get out once a week."* (Male, Student FG WSU)

> *"We went to the clinics in the communities where we did the vitals and would learn about history taking and that here and there."* (Female, Student FG 1 SMU)

> *"I think every week had a certain plan. So, like maybe the first three weeks, maybe you'll do that, you go to the clinic and whatever. And then one week you go to...when did we go to water sanitation plants?"*
>
> (Female, Student FG 1 SMU)

The sub-theme addressed the resources constraints at DTPs and suggested the ways in with these issues could better enable sites to provide a more enriched learning environment. The constraint related to the limited resources and logistics and how these resource limitations impacted on learning.

> *"Yes, with limited resources and it's a primary centre. You can't maybe do obstructed labour and do a C-section in Butterworth. So, they want the tertiary level knowledge of which you are so used to the primary level. So that's the thing that they don't understand that there we at least acquired the primary level and not always going for advanced stuff, always having maybe CT scan available and all those things. You always go...so even though they do have a problem but at some point, I just accepted that, but we were just acquiring the primary skills and being able to manage minor cases."*
>
> (Male, Student FG WSU)

"But you go to a local clinic at home and you one day have to work in that hospital that doesn't have those resources, so if you've been working at tertiary hospital seven years of your life knowing, I can just send you for an MRI, maybe you'll get it in three months, yes, but eventually you'll still get it. But if I'm at a clinic that doesn't even have a CT scan, you have to find ways to manoeuvre and to still deal with the patient that you have now." (Female, Student FG 1 SMU)

"Another thing would be access to the learning material or resources. Like if there are no books, or there is no internet access in that place..." (Male, Student FG WSU)

6.3.4.4 Product indicators

The sub theme of Professional Identity, reflection and achievement of integrated learning was highlighted. The exposure at DTPs allowed participants to develop their professional identity and upon reflection participants were able to speak to how their experience had developed the identity. The reflection of their experience and how it has contributed to the students' identity was robust. Participants were able to reflect on the knowledge gaps that existed in the undergraduate training and how using the site often allowed them to identify the knowledge gaps and support the self-directed learning that they needed to achieve the learning outcomes.

"So, with student internship it was more like procedure, because when we do internal med, if you're at the Gen like you really don't get an opportunity to do a lot of procedures. So, at these sites you basically do those procedures, you are the doctor...you are the intern basically. You're prescribing medication, you're ordering...so I think it's just...I think what they're trying to do is, integrate our learning and that's what they're trying to do." (Female, Student FG Wits)

"You're forced to be independent. So, you get to make decisions, in Durban. In Durban there's always somebody supervising you or your observing. Whereas when you go into the outskirts and rural areas you're forced to perform there independently, which leads to a lot more experience as opposed to down here." (Female, Student FG UKZN)

In contrast to this, there were participants who reported that the expectation to perform as a doctor was not one, they were prepared for through their training.

"...you become limited in your skills as an undergraduate. Although you'll still have more opportunity to learn those things when you come to the tertiary hospital, it's, for an example, where I was there was no Mantoux skin test for TB. It was not there. So...and there were no lab forms and even the sputum bottles were not there in the clinic. Now it becomes a problem because now I'm here as a student and I'm sent by the university to come and learn some of these skills, and only to find that those things are not there. So, it becomes a challenge for the whole factor in a sense that, I won't be able to practise my skills of collecting a sputum, I won't be practising the tuberculin skin test, how it's done, I won't be practising how to fill a lab form because it's not there. Even the urine dip sticks are not there. I won't be able to practise the urine dip sticks. So now when I come back here, I'm going to have an end of block and they're going to assess me on the very same things I was supposed to have learnt, you understand?"

(Male student FG1 SMU)

"I think it's...to just add on, I think sometimes...eish, I don't know, I stand to be corrected but I feel like their expectations sometimes as well are so much. I mean, thinking about going out for Family Medicine for the

first time and you're going to work as a whole doctor, and they expect you to know everything. You really don't. And once you start asking questions, like he said, and they're like, you should know this, and you're just like, okay. Then you don't ask anything anymore because you're not even sure whether the question you have, you're actually really supposed to know or maybe everyone else is also struggling with the same thing?" (Female student FG1 SMU)

Role modelling of the preceptor/facilitator and their teaching/supervision role at the DTP had an impact on role modelling and how they contributed to the learning for students. The facilitator demeanour and how they responded to their role with regard to the teaching and supervision responsibilities was highlighted from the experience.

"They make sure. I feel like they go an extra mile. If I can say, personally, that I learn a lot outside than here. Because we're a lot and like there's many patients here, for example. So there there's not so much as we have here and then they can actually take time to teach us more..."
(Male, Student FG 2 SMU)

"... The teaching was very good because the consultant made time to teach us. And I think because they're a new site, they're enthusiastic about teaching. So, it's difficult here because the consultant sees how many hundreds of people every block, and just gets bored and then stops teaching, or just becomes nasty. So, I don't know, or just because they want to be nasty (laughs). And they teach, they made a proper effort to actually teach you, like one consultant actually taught us on a Saturday, like gave us a two our before our exam, just to help us." (Female, Student FG UKZN)

"Our facilitator in XXX Clinic who is supposed to take care of us, I believe that they should attend maybe seminars where they will teach them some basic psychological things where they teach them education skills, how to deal with us as students. Because sometimes we stress them, you know. They ask us to do something, and we run away and all of this, and they get stressed, and they start to feel like, you know, students are lazy, students don't want to learn. They end up developing this attitude towards us. But I feel like if maybe there could be a common ground whereby these facilitators and almost everyone, you know, is taught how you deal with students, how do you teach, how do you...you know, deal with all these sorts of things when you are there. I think it will be better because sometimes I feel like education is the one that is not there. Because most of them are not taught. So that's how I feel that it would be really, really much better if they had some short courses or something of that sort."
(Male, Student FG 1 SMU)

6.3.5 Discussion

Bolstering the HRH requires improvements and a focus on the education and training of the students who are about to enter the workforce. DTPs have been developed, in part, to address this requirement. The aim of placing students at a decentralised site for their training is to add value to the learning experience and supplement the medical student teaching in traditional academic hospital settings [35]. Exploring the achievement of this aim is partially possible through understanding student experiences as they relate to their placement at DTPs. While experiences are often described as simply positive or negative, these findings are often in relation to isolated experiences. The authors in this study utilised FGDs and a thematic analysis of the experiences for final-year medical students at four DTPs in South Africa highlighting the common features in the curriculum and the delivery of the curriculum. This supports findings from South African studies at our universities related to the delivery of the curriculum[25, 26, 28].

Similar to Mader et al. [36], who reported on the factors that impact on learning, the students in this study reported that learning was facilitated and/or hindered by a number of factors at the DTPs. While the aim of medical training is to train graduates to efficiently take care of the health and medical needs of the community [37], the students at the sites in this study report that DTPs often focused on clinical skill development. Additional skill development related to communication and patient management was supported in some DTPs. The students reported that they experienced improved communication skills with patients and peers, a biopsychosocial approach and the development of communication skills. This speaks to the added value that can be achieved from the exposure at DTP sites. This is supported by the work of Mariam et al. who argue contextual learning at such sites should not only address the workforce scarcity but also enable trainees to acquire the competencies and values needed to provide care in local communities [38]. Furthermore, the work of Salam et al. (2019, pg. 585), highlights that this approach to learning should ensure that "students are active participants, and with their active involvement they gain vital skills, such as communication skills, ability to work independently, teamwork, critical thinking, problem solving skills, social awareness and sense of civic responsibility" [39]. In considering the benefits to learning of skills, both clinical and affective, the findings of this study also uncovered barriers to learning. As with the facilitators to learning, barriers are often expressed in relation to those involved in the delivery of the curriculum.

The site facilitator's critical role, as well as their position in student supervision, is frequently overlooked. The site facilitator provides an important partnership for the faculty, student, and patient [40]. The bulk of site-related issues identified in this study support the value of this relationship, as seen by students in their responses to facilitator interactions that impacted their learning. The ways in which the facilitator contributes to providing the access to patients is important to clinical learning for students [16, 41]. Student living conditions is a major contributor to the negative experiences. In instances where resources are limited, this contributes to negative experiences, while simultaneously driving students to optimise and solidify the learning opportunity. Through their synthesis of the learning opportunities that exist, whether positive or negative as it relates to their experience, the professional identity of the future Healthcare worker is developed.

Resource-constrained environments significantly impacted effective learning, creating barriers for students while at DTPs. These constraints took various forms, such as financial constraints, lack of infrastructure, inadequate access to materials, and shortages of skilled teachers. The effects of resource constraints included limited access to educational materials, limited study and learning spaces, and a lack of professional development opportunities for preceptors. Limited access to technology exacerbated the educational inequities, particularly in areas where digital tools are becoming integral to education. Additionally, resource constraints lead to stress and burnout among preceptors, negatively impacting their ability to inspire and engage students.

To mitigate the effects of resource constraints, innovative approaches should be employed, such as leveraging low-cost solutions like open educational resources (OERs) and peer learning models, prioritising preceptor development through investment in training programs, promoting collaboration through partnerships with local organisations, and using contextualised learning. Strategic interventions should inspire adaptive solutions that ensure

learning remains impactful, and success stories and tools that work in such environments can provide examples of successful learning experiences at decentralised training platforms.

DTPs offer medical students a learning environment that affords them the opportunity to perform particular tasks that contribute to how they apply the theory to practice. This application of their knowledge and their reflections on the experience at the sites supports our understanding of the value that service learning in the form of DTPs can offer. Reflection of the experience of learning for medical students provides insight into professional identity formation [42-46]. The development of the professional identity was an outcome of the overall learning experience for participants in this study. The impact that this context-based learning holds for the participants in this study concurs with the work of Lave and Wenger for identity formation and highlights the potential benefits of service learning [12, 47, 48]. Therefore, the value of leveraging the facilitators and addressing the barriers to learning highlighted in this study, could lead to the development of a workforce that contributes positively towards the HRH crisis.

6.3.6 Limitations

The use of a limited number of DTPs in three provinces in South Africa could limit the generalisability of the findings. However, the combination of experiences across the institutions was similar and indicated similar facilitators and barriers to achieving the exit outcomes that are expected of the undergraduate medical curriculum in the SA context.

6.3.7 Conclusion

The findings of this study demonstrate the need for increased support from both the University and Health Department. The support required includes both curricular and affective support. Support for minimally resource-intensive service-learning programmes can effectively ensure that students achieve the undergraduate learning objectives and have longer, more intensive learning experiences for students [17, 49]. Through emphasising reciprocal learning and reflective practice, service-learning helps students develop skills needed to be effective in working with communities and ultimately achieve social change. This skill development could conceivably support the existing efforts to support competent and effective human resources for health within the region. As with any teaching strategy, the educational and professional development value of dispersed and service learning depends on its implementation [50, 51]. To optimise this implementation, planning and evaluation that is inclusive of student experience is needed.

6.3.8 Competing interests

The authors declare that they have no competing interests.

6.3.9 Acknowledgements

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6.3.10 Funding

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Initiative (Grant No: 107768/Z/15/Z) and Deutscher Akademischer Austauschdienst (DAAD). The DELTAS Africa Initiative is an independent funding scheme of the African Academy of Sciences (AAS)'s Alliance for Accelerating Excellence in Science in Africa (AESA) and supported by the New Partnership for Africa's Development Planning and Coordinating Agency (NEPAD Agency) with funding from the Wellcome Trust (UK) and the UK government. The statements made and views expressed are solely the responsibility of the Fellow. LCR holds a South African Research Chair, funded by the South African National Research Foundation (Grant #102219).ARD held a Thuthuka grant, funded by the South African National Research Foundation for 2017-2019;Carnegie Foundation for the Advancement of Teaching [Grant No–B 8606.R02]; South African National Research Foundation [SARCHi]; South African National Research Foundation [Thuthuka]

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6.4 Chapter Conclusion

In this chapter, we explored the experiences of final-year medical students learning at DTPs.

The next chapter will discuss the preceptors at DTPs.

7 CHAPTER 7: The teaching presence of preceptors in the learning environments at decentralised training platforms.

7.1 Manuscript details

Chapter seven is presented as a manuscript structured according to the journal guidelines. The paper was submitted to the Frontiers in Medicine Journal. Frontiers in Medicine is an online, multidisciplinary journal which advances medical knowledge. It supports the translation of scientific advances into new therapies and diagnostic tools that will improve patient care. The paper explored the preceptor experiences at DTPs. The manuscript's title is *The teaching presence of preceptors in the learning environments at decentralised training platforms.*

Journal: Frontiers in Medicine

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DHET accredited

Impact factor: 3.1

7.2 Details of author contribution

The Contributor Roles Taxonomy (CRediT)[100] was used to outline the authors' contribution to the study. The full explanation of the terms is in Annexure 13.

7.2.1 Table 1: Details of author contribution

	Dreyer	Rispel
Conceptualisation	✔	
Method	✔	
Resources	✔	
Manuscript writing draft	✔	
Manuscript writing review and editing	✔	
Supervision		✔

7.3 Submitted article to Journal for review

7.3.1 Abstract

Background: Decentralised training platforms (DTPs) are crucial in transformative medical education, providing an extended learning environment outside the main campus for undergraduate medical students. Preceptors play a vital role in teaching students, acting as role models and supervisors, and facilitating the socialisation and development of students into professional fit to practice. They must balance their roles as both teachers and clinicians.

Aim: To explore the experiences and perceptions of preceptors and staff at the DTPs related to teaching at these DTPs.

Setting: The study recruited preceptors through purposive sampling from four selected universities based on eligibility criteria, including supervision of students, willingness, and availability to participate.

Methods: The study used semi-structured interviews with preceptors to explore their experiences and perceptions, transcribed verbatim, and analysed using thematic content analysis using the CoI framework, focusing on cognitive, social, and teaching presences.

Results: Clinical education is a complex field that requires both preceptors and staff to balance clinical duties with educational responsibilities. Preceptors who engage in continuous professional development experience increased competence and professional status, while staff, including newly qualified nurses, report positive experiences. However, the complexities extend beyond these experiences to include communication skills and patient advocacy. Clinicians may encounter systemic and interactional barriers, and cultural contexts can influence priorities and challenges. A dynamic and culturally sensitive approach is needed to foster competent healthcare professionals adept in communication and patient advocacy.

Conclusion: The study confirms the CoI survey's factor structure and hypothesized causal relationships among presences, highlighting the crucial role of teaching presence in establishing and sustaining a community of inquiry. Further research is needed to explore dynamic relationships across disciplines and understand specific sub-elements of each presence, including autonomy, variety, supervision, social support, and orientation towards teaching and learning, reflecting the learning environment's culture.

Keywords: preceptors, learning environment, decentralised training platforms, South Africa

7.3.2 Introduction

Decentralised training platforms (DTPs) are an essential component of transformative medical education and offer an extended learning environment outside of the classroom, off the main campus for undergraduate medical students (Dreyer & Rispel,2021). These learning environments, used in education for the health sciences provide alternatives to the classroom setting. It is common that learning in hospital settings rather than in the classroom teaching (Rotem et al.1995) takes place to develop the graduate exit competencies. It is thus imperative that attention to these learning environments continues and is argued to remain a significant matter for medical and other health sciences educators to investigate (Roft,2005),(Stewart,2006), (Rusticus et al.1995).

The disciplines that form the undergraduate training programmes depend on practitioners at the site to teach students (Yonge et al. 2005). This teaching is expected to contribute to the learning of the students and develop the necessary competencies. In this role, preceptors make an invaluable contribution and act as a role model and supervisor, thereby facilitating the socialisation and development of the student into a professional fit to practice (Bartlett et al.2020). Recognition is given that these preceptors continue to juggle the roles of teacher and clinician while carrying out this responsibility as preceptor (Burns et al.2006).

A strategy to education and learning that is utilised in the fields of nursing, medicine, pharmacy, and dentistry is called preceptorship. It entails providing students with training in clinical settings to develop their clinical and ethical abilities (Coates & Gormley, 1997) (Broadbent et al.2014) (Billay & Myrick 2008). A highly competent professional, the preceptor is responsible for providing direct supervision and advice to undergraduate and graduate students while they carry out their practical responsibilities. In addition, the preceptor fulfils the job of an assistant. A close relationship that is centered on teaching and learning is established between the trainee and the preceptor, who acts as a source of inspiration for the trainee (Heffernan et al.2009) (Panzavecchia & Pearce, 2014).

The preceptor plays a significant part in the process by mentoring and role-modeling the students' knowledge, abilities, and practice to boost students' confidence and improve their practice. This provides the students with the chance to be shaped into an independent practitioner who makes decisions via positive engagement (Panzavecchia & Pearce,2014). This style of learning in practice, which is mediated by a preceptor, is favorable to the development of a critical awareness regarding reality on the part of the student. It is anticipated that students who get professional training in the twenty-first century will be able to apply a critical perspective to their work and, when required, be capable of initiating actions that will result in the alteration of reality (Frenk et al.2010).

The Community of Inquiry (CoI) framework is based on social constructivist education theory and serves as a framework for teaching and learning (Garrison & Arbaugh,2007) (Swan & Ice, 2010) (Garrison et al.2001). The CoI identifies and measures three essential elements of an educational experience: cognitive presence; social presence; and teaching presence. The CoI framework offer these three inter-related presences as elements to review (Garrison et al.1999). The framework has been used extensively in the research and practice of learning contexts and, hypothesises the causal relationships that teaching and social presence have a significant perceived influence on cognitive presence and that teaching presence is perceived to influence social presence. As DTPs provide the platform for teaching and learning, the framework provides a useful approach to analysing the educational experience of medical students at the study sites.



Figure 1:Garrison DR, Anderson T, Archer W. Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. The Internet and Higher Education. 1999;2(2-3):87-105.

The learning that takes place at DTPs can thus be explored as blended learning approaches used in undergraduate medical education. Garrison, (Garrison et al. 2009) defined social presence as "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities". The teaching presence, the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes (Anderson et al.2001). Garrison et al, refer to cognitive presence as "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse" (Garrison et al.2001).

In this paper, the CoI framework is used to construct meaning to the experiences of preceptors' and staff at the existing decentralised training platforms and their contribution to the development of knowledge construction for students at DTPs.

7.3.3 Methodology

7.3.3.1 Study population

Data was collected by means of interviews conducted at selected sites with staff who are designated or function as preceptors for each of the three institutions. The researchers designed this study to triangulate the data collected within a larger study aimed at gaining a better understand the ways DTPs are used in the undergraduate training of medical students.

7.3.3.2 Table 1: Demographic Data of Participants

Participant	Gender	Age	Length of Service	University
1	Male	58	< 5 years	University of KwaZulu-Natal (UKZN)
2	Female	44	> 5 years	University of KwaZulu-Natal (UKZN)
3	Female	52	> 5 years	University of KwaZulu-Natal (UKZN)
4	Male	48	> 5 years	University of KwaZulu-Natal (UKZN)
5	Male	54	< 5 years	Walter Sisulu University (WSU)
6	Male	48	< 5 years	Walter Sisulu University (WSU)

7	**Male**	**48**	**> 5 years**	**Walter Sisulu University (WSU)**
8	**Female**	**60**	**< 5 years**	**Walter Sisulu University (WSU)**
9	**Male**	**56**	**< 5 years**	**University the Witwatersrand (Wits)**
10	**Female**	**52**	**> 5 years**	**University the Witwatersrand (Wits)**

7.3.3.3 Study setting

The study was conducted at the Sefako Makgato University (SMU), the University of KwaZulu-Natal (UKZN), Walter Sisulu University (WSU) and the University the Witwatersrand (Wits). These universities are in three South African provinces.

7.3.3.4 Recruitment

Purposive sampling of participants was applied and were selected based on the eligibility criteria, that were identified as individuals responsible for the supervision of students placed at the site or designated as the preceptor for student rotations, their willingness and availability to participate. Participation was voluntary.

7.3.3.5 Data collection tool

Individual interviews were conducted in person, using a semi-structured interview guide to explore the experiences and perceptions of preceptors who supervise the student visits at the DTPs the advantages/strengths in making use of decentralised training platforms and the barriers/ constraints that exist at decentralised training platforms. The interview also explored, specific actions needed to improve DTPs, the opportunities of DTPs to transform medical education, both at the relevant university and the country, and any recommendations for upscaling of DTPs and transforming medical education. Interviews ranged from 48 -60 minutes.

7.3.3.6 Data analysis

Interviews were transcribed verbatim. Thematic analysis was used to analyse the interview content. Inductive theme coding was used during the analysis, supported by MAXQDA 2024, to determine emergent themes (Nowell et al.2017). This process led to the identification of themes (Vuso & James,2017) (Greenwood et al.2017). Two authors as well as an independent checked the thematic analysis on a selection of transcripts.

There was a high degree of agreement and where there were minor differences, these were discussed and resolved leading to an agreed list of codes, categories and subcategories. They then identified themes from the codes and categories discussed them with the first author and reached consensus on any minor differences.

Codes were then grouped according to the CoI framework using the three inter-related presences, cognitive presence; social presence; and teaching presence. The trustworthiness model of Lincoln and Guba's (1985) as cited in Holloway and Weeler (Holloway & Galvin, 2017) was utilised in this study. Trustworthiness such as the truth of the participants' views, which was supported through the first author's engagement during interviews and observations and tracking of audit trails was evident. Trustworthiness of the data is supported by the transferability of findings, namely if a study will be conducted in similar conditions, similar data will be obtained. Conclusions and interpretations made from the dialogues of participants and in-depth data confirm the criterion of confirmability. Authenticity was attained through the participants' views, feelings and precise verbatim quotes relating to trust and trusting

relationship. Triangulation of the data was thus assured through member checks, field note comparison, observer reflection and the above verification of the data. The aim of this triangulation was to "overcome the inherent biases in a single investigator, single theory or single method approach" (Halcomb & Andrew,2005).

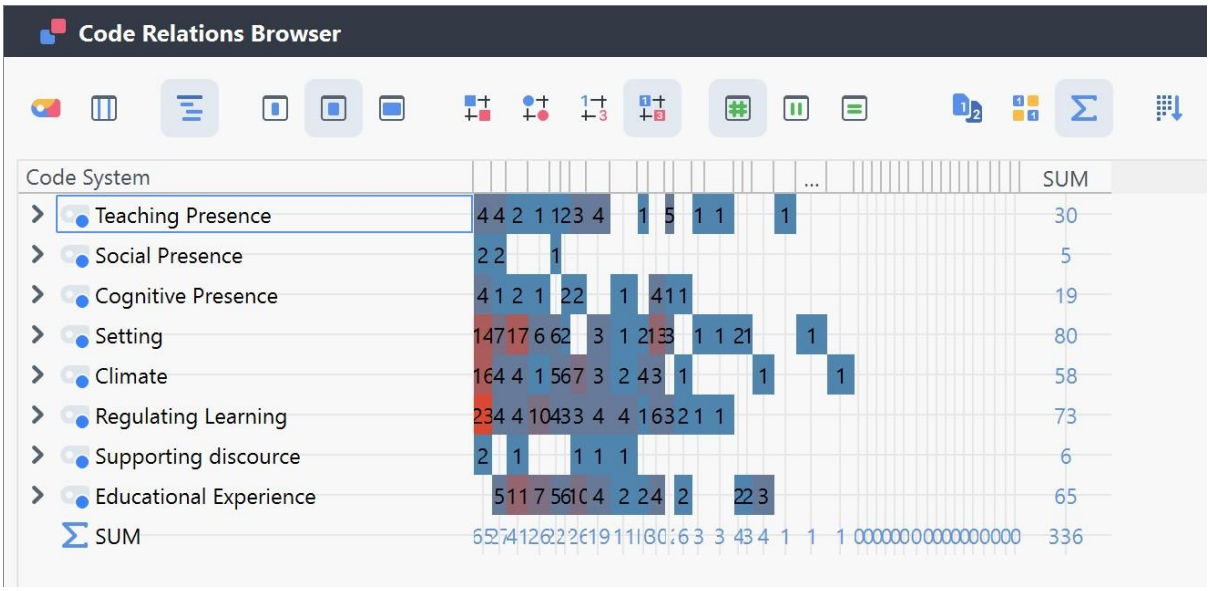


Figure 2: Code relation matrix. Produced in MAXQDA 2024.

7.3.3.7 Ethical considerations

The Human Research Ethics Committee (HREC) Medical of the University of the Witwatersrand in Johannesburg granted ethical approval for the study (M170704). The signed consent forms were received from all participants. All ethical guidelines were adhered to including a detailed information sheet, informed consent, voluntary participation, anonymity of respondents and ensuring confidentiality of information.

7.3.4 Findings

Ten preceptors were interviewed. UKZN (4), WSU (4), Wits (2). No preceptors were available to be interviewed from SMU.

7.3.4.1 Setting/Climate

Preceptors are crucial in medical education, assisting students in applying their academic knowledge to real-world scenarios and supervising clinical practice. They shape future healthcare practitioners' professional development by serving as educators, mentors, and role models. Preceptors' dedication to the medical field and their love for training the upcoming generation of healthcare workers motivate them to teach, bridging the knowledge gap between academic knowledge and practical skills. While the length of time in the role as a preceptor differed across institutions.

> *"I've been here from 2002, first a registrar and then a specialist"* (Preceptor 04, UKZN)
>
> *"I have been here at the Alex CHC since 2015"* (Preceptor 01, Wits)
>
> *"I started as a preceptor at Mbekweni Health Centre in 2015"* (Preceptor 02, WSU)

Particularly in professions like nursing, preceptors are essential to students' mentoring. They provide direction, motivation, and useful information in their dual roles as coaches and mentors. By providing students with practical experience in a secure and encouraging setting, preceptors aid in bridging the gap between academic understanding and real-world application. Additionally, by setting realistic goals, modeling professional conduct, and offering ongoing feedback, they aid students in honing their clinical and critical thinking abilities. The position is quite fulfilling for many preceptors. They frequently feel more fulfilled in their work, a sense of achievement, and rejuvenated after mentoring the upcoming generation of professionals. Preceptors identified with the role and found great enjoyment in the role.

> *"Yes! It's motivating for us. I'm very happy with the programme. I know it's not the same at all the places but here at Mbekweni we have this very proper space. I can do both things I like teach and be a doctor. So, I'm fulfilling my dreams."*
> (Preceptor 02, WSU)

> *"Wanting to take this responsibility was my decision. I don't know whether others enjoy it but (laughs) at least it was my decision, and I take the responsibility very seriously."* (Preceptor 01, Wits)

> *"I think I enjoy because it's an isolated place, it's a silent place, calming place. Different to the noisy place of most clinics."* (Preceptor 04, UKZN)

> *"What do you I like most about my work as a preceptor or teacher within the programme is that I have been doing this for many years now. What I prefer is to teach students. There's lots of other people that wouldn't want to do that, they don't want to work with students. I come from a family of teachers, but not doctors. This way I can be both. But if I needed to choose to be a teacher or be a doctor, I prefer to be a doctor."*
> (Preceptor 04, UKZN)

Preceptors usually need to complete specialised training to carry out their teaching duties in an efficient manner.

> *"I wish that I could have had some more training to prepare me for the role as a teacher. I just learnt as I went along. I am better now but I think back to how useless I was with the first few groups of students, I am quite embarrassed when I think back to me then, but now I feel very competent and am proud of my role and how I support students in their learning journey"*
> (Preceptor 02, WSU)

> *"I just learnt as I went along. I am better now but I was bad in the beginning"*
> (Preceptor 01, Wits)

> *"It would be really great to get some formal training in education, more specifically medical education so that I have that grounding as a basis for my role as preceptor"*
> (Preceptor 02, UKZN)

7.3.4.2 Regulating Learning

Preceptors identified that as preceptors they significantly influence the learning environment for medical students by providing guidance, support, and real-world clinical experience. They act as mentors, and role models, fostering a psychologically safe environment and encouraging

open communication channels for students. Preceptors bridge the gap between theoretical knowledge and practical application, ensuring students are well-prepared for future healthcare careers.

7.3.4.3 Supporting discourse

Supporting discourse in educational settings involves fostering open communication and collaboration among students, educators, and stakeholders to enhance the learning experience. However, preceptors identified that the expansion of educational sites often faces limitations and constraints such as budgetary restrictions, logistical challenges, and regulatory hurdles. These factors can impede the development of new facilities or the enhancement of existing ones.

> *"Money, Money and then more money and time"* (Preceptor 02, WSU)

> *"Money, time and people. People…because we don't have sufficient funds, you cannot appoint all the supervisors you would ideally like in a mentorship type of relationship coaching type of thing. But I think we do pretty well for what we have. And our management, as I said, are usually supportive. I do get from time to time, from top management, you have to cut down your sessions, if the transport becomes too much, and so on. But the curriculum committees sort of say, no, no, this is the place where they have to learn, we cannot reduce the time in the community. So…but those requests come because of budget and funding. The university really struggles financially. So, it's always sort of…a way to try and find a solution for something. The point is the Department of Health do not provide anything for us, so we have to buy everything. Every dipstick, everything. So, it's getting those things on time because sometimes our procurement process takes unacceptably long unfortunately. But in the end, we get it"* (Preceptor 03, WSU)

> *"This year we had to cut down because we've run out of funding, not space. So, we needed to cut down a bit and…so in the first semester we only managed to offer eight homestays per block"* (Preceptor 01, UKZN)

> *"We don't get much support from management…but we tend to have some district managers who do support us. And then the head from province comes, generally"* (Preceptor 01, Wits)

> *"And there's a lot of capacity building for the management because the district hospitals see them as part of the university. So, when there is need for capacity they will come and say, okay, this is where we need to help. We work with communities, then that again helps. So, all these are additional values. Because this is a training site people feel it's better, so people are willing to come and learn… And so, it's both those relationships as well, indirectly, made it a lot stronger"* (Preceptor 01, WSU)

Additionally, failures and negative feedback from students can arise from various issues, including inadequate resources, insufficient support, or misalignment between learning activities and objectives. Addressing these concerns requires continuous evaluation and adaptation to ensure that educational environments meet the evolving needs of students and provide a supportive, effective learning experience.

> *"So, the only complaint that we have is that it's a lot of work: writing up, recording, documenting"* (Preceptor 01, Wits)

"And it's kind of assumed by some of the comments saying like, you know, they don't get taught this, or they have got no clue about whatever, but it's kind of I think that's part of how the disjuncture happens between how you are being taught in the first three years and how you've been taught in the last three years" (Preceptor 01, UKZN)

7.3.4.4 Social presence

Social presence, collaboration, and connectedness play a crucial role in student placements at various sites. When students actively engage in social networks and collaborative activities, they build essential relationships with peers, mentors, and industry professionals. This connectedness not only enhances their learning experience but also opens doors to valuable opportunities. Students placed at sites often demonstrate strong teamwork and communication skills, which are honed through collaborative efforts.

"Okay, there are one or two who still don't know how to work as a team and they come and say, I'm going to do this on my own, I want to do this on my own. Ja, they do very well, they do excellent jobs, but then you realise, shame, you know, you're in the wrong profession… because if you don't know team work you're not going to survive, but anyway…and then…ja, so they learn that, they learn teamwork, they learn how to make plans, how to plan, and work as a team basically" (Preceptor 02, UKZN)

"It's extremely important. We cannot do this without having that good relationship. And whenever there was a break in the relationship of trust, we really put a lot of effort to build it up again. And…as I said at this stage, we really have very good relationships with the community…who will call us even if there's a women's society having a special Women's Day sort of thing, they will call the sister working in the area. Can't you and a few students come and do some voluntary thing on Women's Day or Youth Day or around World AIDS Day? And then we try to help as far as possible, even if it's not part of the curriculum" (Preceptor 02, Wits)

"So, I think…yes, we have. A lot of the sites actually are built around long-term relationships where that has been quite a bit of investment of in terms of relationships, support, kind of visits, CPT, all sorts of activities in those sites over like quite a bit of time anyway. And that's true for the PHC sites in the urban areas as well as the rural sites. Quite a few of the rural sites have got a very strong emotional link for people in the department where, like an example is, me having worked in Emmaus for quite a long time, and so I go back to Emmaus, and so the kind of that continuity of me going back, it's really wonderful for Emmaus, people get really joyous when I go and whatever; like it's not only the doctors but nurses and cleaners, and everyone, you walk around and it's like you tell stories and whatever. For the students it's kind of they are often really surprised by this when…the relationships that continue. And so that…it's kind of a…like one of these not so obvious kind of dimensions of the type of support. But the relationship is really critical, and I think that in that model that Marieke de Villiers and co, like that whole team has developed, kind of the relationship in the centre, for me that is absolutely critical, like without that relationship nothing works" (Preceptor 01, UKZN)

In essence, fostering these connections is vital for students to transition smoothly from academic environments to professional settings, ensuring they are well-prepared for future practice.

"Better prepared. They are prepared. And actually, I would say that it's an opportunity given to them to embrace medicine in the real sense of caring for people"

(Preceptor 01, Wits)

"They learn to do continuity of care. They learn to actually apply empathy. Because they are firsthand with the patient. They understand the difficulties of life. They learn to work with families, because in a rural hospital, the whole family comes when there's an issue, so they have a chance to talk. And also, understand the cultural issue. When somebody is seriously ill, they want to bring the church congregation to the ward, right? So, they actually understand the in death and dying or in palliative care, there's a huge place for spirituality. All our patients in the rural areas are coming from the traditional healers anyway. So, they learn to actually understand and if possible, work with the complementary medicine. They learn to work with less resources. They learn to work in the real world. Socially hospitals are just very artificial situation. It's very artificial. It's not the real life. So, they're actually vibing in the district hospital, they learn to work be…Better prepared. They are prepared. And actually, I would say that it's an opportunity given to them to embrace medicine in the real sense of caring for people" (Preceptor 01, WSU)

7.3.4.5 Cognitive presence

Preceptors identified ideas that could strengthen the connecting of ideas and information in the programme offered at decentralised training platforms for future engagements

"What! So, it's like those sort of ideas, and that works well in a context like that. If you're only working in a regional hospital where people refer to you, you never understand what the difficulty of referral is. So, it's really placing that sort of…and it's that authenticity of the environment that I think is really critical" (Preceptor 01, UKZN)

"I suspect a lot of our thinking will quickly evolve once it becomes apparent what existing structures are. I think that's what people like me are looking for, is once they get a better sense of where are these sites, how many people are we talking about, then we can start getting concrete. At the moment it's all these ideas is…the faculty is planning something out there, and I think it's that kind of framework…once my mind is concentrated, we've got these facilities, these number of people, then we can start thinking about feasible projects. So, I think that's…so that's my bottom line about decentralisation. Obviously conceptually I strongly support the notion, but its value, its ability to offer meaningful extensions to the curriculum, to competency achievement, for me still is too theoretical at this stage, and even that theoretical I haven't engaged sufficiently" (Preceptor 02, Wits)

"Like how do we…so another exercise, how do you refer to a regional hospital? They do a teleconference where they then need to refer a patient. And because doing a referral is completely different to doing a ward round presentation. The purpose of that is different, so you need to learn how to talk; when you pick up the phone, you need to introduce yourself, who you are, what rank you are, where you're calling from, all of the basic, basic things that are obvious when you do the referral but if you've never done it you say, hello, will you take the patient. What! So, it's like those sorts of ideas, and that works well in a context like that. If you're only working in a regional hospital where people refer to you, you never understand what the difficulty of referral is. So, it's really placing that sort of…and it's that authenticity of the environment that I think is really critical" (Preceptor 01, UKZN)

7.3.4.6 Teaching presence

Preceptors identified the concept of teaching presence transcends mere instruction; it embodies the commitment of educators to create an engaging and supportive learning environment.

> *"So, I think the one challenge would be the standardisation, I standardisation is really difficult, and I think one maybe needs to do the standardisation of setting out the scope of work that they need to cover. So having a skills book and all the skills that they need to do. Or having a list of conditions that they need to cover and be competent at. But the challenge around that is how we kind of influence the local learning. So often the local learning may be very good or very poor. But we are not able to*
> *build on the very good or challenge the poor because we are so far removed. And again, so how do you do that, how do you create that for students"* (Preceptor 01, UKZN)

Effective teaching presence fosters a sense of community and connection among students, which is essential for motivating and enhancing learning outcomes. When educators actively participate in discussions, provide timely feedback, and express genuine interest in students' progress, they establish a profound influence on academic success.

> *"I think it is a challenge. And so, what I've thought about putting people out there…and that's why the medicine block was one that we pushed because that's low hanging fruit; it can be done in a distributed platform without too much trouble. It's also a low stakes exam for students. It doesn't…it's not one of those that fails them usually. So, they see it as easier to obtain the competency required"* (Preceptor 01, Wits)

> *"Consolidates the learning and identifies the gaps and…I think in a tertiary hospital students, like fifth year students is at the bottom of the food chain; like there's a consultant, cardiologist, there are other consultants, then you have a senior registrar, your junior registrar, you have your medical officers, you have your final year medical students, and the fifth year medical student there's nobody behind. They just parade in the ward; they don't do anything…they are not acting member. But in a district hospital they are the person. Students are involved in the patient management with the doctor. So that is an opportunity for them to actually learn"*
> (Preceptor 02, UKZN)

> *"So, the objective is to acclimatise the student to difficult environments in the country, and that is a reality, and then make them to adapt and find the best way of… Serving that community and then to learn. So…I think it's a context in which our programme is. If you ask, are we having the best of accommodation? Probably not. If we are having the best of connectivity? Probably not. Do we have the best opportunity to help patients? Yes. And then patients remember that. I think one of my…in the feedback from one of the students, says, there was a patient I saw in casualty, then I clerked the patient; when the doctor wanted to admit, I admitted the patient. The following day I went to theatre to assist when they operated on this patient. And a week later when they discharged, I went and wrote the discharge form for the patient. When this patient came three weeks later for review, he saw me from far and he greeted me from far, he said, Doc, I'm much better now. And he said that day I felt I'm a doctor"*
> (Preceptor 02, WSU)

7.3.4.7 Educational experience

The educational experience is designed to provide students with hands-on, practical learning opportunities that complement their academic studies. Students are placed at our facility to gain real-world experience, develop professional skills, and apply theoretical knowledge in a practical setting.

> *"We don't hear a lot of complaints, and they usually want to do it, and they feel it's practical handson, and the nurses are patient and teach them. And even in casualties the feedback that I got is that, you know, those doctors they really teach us. It's one of the good learning experiences that we get is that the doctor is there to teach us, he's not there to teach patients"* (Preceptor 03, UKZN)

> *"So, he's patient, he shows us over and over how to palpate or examine, or whatever, and he spends time helping us develop clinical reasoning in terms of the diagnosis and so on. So, in general it's good*
> *feedback. Maybe they won't tell me the rest, the bad stuff, but they can apply the knowledge they have and learn more of the skills in a practical way"* (Preceptor 03, WSU)

The learning objectives are carefully crafted to align with the activities students engage in, ensuring a cohesive and comprehensive learning journey. Preceptors identified that the overall educational experience related to attributes which include appropriate levels of autonomy, variety and workload, quality of supervision and social support, and, most important, the overall orientation toward teaching and learning, reflecting the culture prevailing in the learning environment.

> *"… the staff will facilitate the supervision but you the preceptor you are their contact and form part of*
> *the support network students need"* (Preceptor 03, Wits)

> *"You provide so much more than just supervision for the students. Yes, you also indirectly familarise them to the setting and become a point of contact for them"* (Preceptor 03, Wits)

7.3.5 Discussion

In contemporary medical education, effective mentoring of students has become integral to the development of competent physicians. This paradigm shift emphasises the need for preceptors to not only impart knowledge but also facilitate cognitive engagement among undergraduate medical students. A robust framework for understanding this interaction is anchored in the Community of Inquiry (CoI) model, which suggests that cognitive presence is paramount to meaningful learning experiences. By actively participating in the student's educational journey, preceptors create an environment conducive to critical thinking, reflective practice, and the application of theoretical knowledge. Consequently, their role transcends mere supervision; they become catalysts for skill acquisition and problem-solving. Establishing a strong cognitive presence not only fosters deeper understanding but also aligns educational practices with the dynamic demands of healthcare, ultimately ensuring that students are well-equipped to navigate complex clinical environments and deliver high-quality patient care.

Preceptors can improve their teaching skills through continuous education, feedback, mentorship, and using teaching models. Continuous education helps stay updated with the latest teaching methods and clinical practices. Regular feedback from students and colleagues

provides valuable insights for improvement. Connecting with experienced mentors fosters a collaborative learning environment. Setting clear learning objectives aligns preceptors and students, and staying current ensures accurate information.

Triangulation of student data highlights the importance of training preceptors, who play a crucial role in bridging the gap between theoretical knowledge and practical application. However, without proper training, preceptors may struggle to provide consistent, effective guidance. Challenges identified include inconsistent supervision, communication gaps, lack of understanding of educational principles, and overburdened preceptors. Training ensures consistent student experiences, enhances teaching and feedback skills, builds confidence and competency, and fosters professional development. Recommendations for preceptor training programs include workshops on teaching strategies, time management support, interdisciplinary collaboration, and ongoing support and resources. These programs aim to provide students with the guidance and support they need to succeed, ultimately improving the quality of future healthcare professionals. By implementing these recommendations, healthcare institutions can ensure that students receive the guidance and support they need to succeed, ultimately improving the quality of future healthcare professionals.

The integration of cognitive presence into medical education is vital for fostering critical thinking and effective clinical decision-making among undergraduate students. Cognitive presence, defined as the ability to construct and confirm meaning through reflection and discourse, enhances the learning experience by bridging theoretical knowledge with practical application. As students engage in reflective practices within their clinical environments, they develop a deeper understanding of medical concepts and their implications for patient care. This process is particularly accentuated through the guidance provided by preceptors, who serve as mentors in various healthcare settings. They facilitate cognitive presence by encouraging students to analyse realworld scenarios, fostering an environment that promotes inquiry and self-confidence. Studies indicate that structured support, like post-registration preceptorships, significantly bolsters new graduate nurse's self-efficacy in their professional roles, emphasizing the importance of mentorship for enhancing cognitive presence and competence in medical education (Cheung, 2007). Thus, cultivating cognitive presence is necessary for producing skilled and confident healthcare professionals.

Engaging in meaningful interactions within clinical settings is paramount for the cognitive development of undergraduate medical students. The role of preceptors becomes particularly significant as they guide these students in integrating theoretical knowledge with practical skills, promoting higher levels of cognitive presence during training. Preceptors not only impart knowledge but also facilitate critical thinking by encouraging students to reflect on their experiences and decisions in real-time clinical scenarios. As outlined in existing literature, the structured support provided through post-registration preceptorship has been shown to enhance new graduate nurses' confidence in professional competencies, thereby highlighting its indispensable role in fostering cognitive presence (Cheung, 2007). Furthermore, simulation-based learning environments (SLEs) have emerged as valuable tools in health education. While they allow for risk-free practice, aligning them with effective preceptorship can reinforce the cognitive learning process, ensuring that students can translate their simulated experiences into competent, confident performance in real-world situations (Mills,2016).

Effective preceptors employ a variety of strategies to cultivate critical thinking and reflection in their students, which are essential components of nursing education. These strategies include interactive dialogues, problem-solving tasks, and the application of cognitive apprenticeship principles, which emphasise learning through guided experiences. For instance, preceptors often incorporate scaffolding techniques, allowing students to build upon their existing knowledge while developing their clinical judgment skills (Vygotsky, 1978). This approach creates an environment that fosters confidence and encourages students to engage deeply with clinical scenarios. Furthermore, the establishment of respectful, mutually beneficial relationships between preceptors and students enables open discourse, which is vital for reflective practice. In examining the Irish preceptorship model, it is evident that when preceptors adopt these methods, they not only enhance student learning but also ensure that future nurses are equipped to navigate the complexities of patient care as highlighted in research by Kavanagh and Swzeda (2018) regarding clinical judgment deficits in new graduates (McSharry,2012) (Farrar,2023).

An effective preceptor-student relationship is foundational to cultivating the competence and performance of undergraduate medical students in clinical settings. Preceptors play a critical role in fostering an environment conducive to learning, characterised by the application of interactive teaching strategies such as demonstration, coaching, and scaffolding. These methods not only enhance the students understanding but also instil confidence through consistent and respectful engagement, underscoring the necessity of time dedicated to teaching (McSharry, 2012). Furthermore, the application of noncognitive assessments, such as the multiple mini-interview, highlights how preceptor support can extend beyond cognitive skills to evaluate essential attributes like empathy and teamwork, which are pivotal for effective patient care (Eckrote, 2019). Ultimately, the symbiotic relationship between preceptor support and student development is vital in bridging academic knowledge with practical competence, ensuring that students are not only proficient in clinical tasks but also competent in their professional roles.

Effective preceptor engagement is pivotal in shaping the clinical education experiences of undergraduate medical students, significantly influencing their overall competence and performance. Research has highlighted that well-structured preceptorships foster a collaborative learning environment, facilitating the development of essential clinical skills and critical thinking. This engagement extends beyond mere supervision; it encompasses mentorship that instils confidence in students, ultimately enhancing their self-efficacy in clinical settings. For instance, the implementation of the dedicated education unit model has demonstrated positive outcomes, effectively bridging the gap between theoretical knowledge and practical application through active preceptor involvement (Van Housen,2023). Additionally, a holistic review of preceptor involvement reveals that consistent engagement positively correlates with improved student outcomes, emphasising the necessity for programmes to prioritise these relationships in their curricula (Eckrote,2019). Consequently, the interplay between preceptor engagement and student performance is not only significant but also essential for preparing competent healthcare professionals.

7.3.6 Conclusion

The findings from this study underscore the vital importance of preceptors in fostering cognitive presence within medical education, significantly enhancing students' competence and performance. By adopting interactive dialogue and employing diverse pedagogical strategies,

preceptors not only facilitate comprehension but also boost students' confidence, mirroring the successful approaches highlighted in midwifery education, where clinical facilitation was found to be highly valued by students (Cornell, 2022). Moreover, the variation in teaching practices among preceptors indicates the necessity of aligning educational methods with defined learning outcomes, enhancing the student's ability to apply knowledge in real-world scenarios. As evidenced by the discrepancies in focus between service needs and professional educational values in nursing preceptorships, there is an urgent need for a coherent framework that prioritises critical thinking and patient-centered care (McSharry,2012). Ultimately, effective preceptorship holds the potential to transform medical training into a more competent and performance-oriented experience for future practitioners.

The study's comprehensive results illuminate critical relationships between preceptor engagement and the cognitive development of undergraduate medical students. Findings indicate that active participation by preceptors not only enhances students clinical reasoning skills but also encourages a deeper understanding of medical complexities. Through structured feedback mechanisms and reflective practices, preceptors facilitate a collaborative learning environment that promotes both knowledge retention and application in varied clinical contexts. These insights underscore the necessity of integrating preceptorship as a fundamental component of medical curricula, particularly in fostering competencies that are essential for effective patient care. Considering these findings, future medical education practices should prioritise training preceptors to adopt pedagogical strategies that emphasise cognitive presence, ensuring that students are not passive recipients of information but rather active participants in their learning journey. Ultimately, this approach may raise the standards of clinical education and better prepare students for the evolving challenges of modern healthcare.

7.3.7 Limitations

The results of this study confirm the factor structure of the CoI survey and the hypothesised causal relationships among the presences predicted by the CoI framework. These results point to the key role of teaching presence in establishing and sustaining a community of inquiry. Further research is called for to explore the dynamic relationships among the presences across disciplines and institutions as well as understand the existence and role of the specific sub-elements (categories) of each presence. Future research should focus on exploring adaptive teaching presence strategies that cater to diverse learner needs, particularly in hybrid learning settings. There is a pressing need to investigate the long-term impacts of teaching presence on student outcomes, incorporating quantitative measures to substantiate qualitative findings. A standardised set of preceptor competencies and assessment methods have been identified across health professions, with some having performance indicators for effective measurement, but further research is needed to determine the minimum standard. The model of preceptorship's success requires evaluation, and the minimum level of competence is not determined. A consensus approach like the Delphi method could improve confidence in identified competencies.

7.3.8 Conflict of interest

No conflict of interests to declare

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7.4 Chapter Conclusion

In this chapter, we explored the experiences of preceptors responsible for the supervision and teaching of medical students learning at DTPs. The next chapter will look at the integrative synthesis of the PhD study findings.

8 CHAPTER 8: DISCUSSION AND RECOMMENDATIONS

8.1 Introduction

This chapter presents a summary of the preceding chapters in this thesis, linking study results to the overall objectives of the thesis. The summary will be followed by the strengths and limitations of the thesis. Finally, educational and research recommendations emanating from the results will be made.

Adopting a mixed methods approach to data collection and analysis; this thesis demonstrates the need to comprehensively understand the complex processes of teaching and learning that occur specifically during clinical placements. This thesis aimed to examine decentralised training platforms (DTPs) utilised in undergraduate medical education by the health science faculties of four South African universities and their role in transforming medical education. Decentralised training platforms (DTPs) are defined as any learning environment such as a primary health care facility (clinic or community health centre), district hospital or non-governmental organisation used for medical (or health professional) education and training.

Objective 1 described the common characteristics of DTPs as they are used across the four universities. Findings from the study provided insight into the financial resources, human resources, and other investments institutions need to make DTPs functional learning environments. The common use of these DTPs provides a context in which students can better understand their patients and their specific context.

A document review was conducted to address Objective 2, comparing the teaching or learning objectives at the DTPs both within each institution and across the four institutions. The findings revealed a shared commitment to developing key competencies essential for delivering quality healthcare. These results emphasize critical thinking, evidence-based practice, and the application of knowledge in clinical settings. Despite variations in curriculum and pedagogy, there is consensus on the importance of equipping students with a core set of skills that include patient care, communication, and ethical practice. This alignment ensures that graduates are prepared to meet the demands of the healthcare sector and contribute to the well-being of communities. The integration of these competencies across DTP programmes reflects a broader trend in health professions' education, where interdisciplinary collaboration and a holistic approach to health are increasingly valued.

Through a qualitative study, Objective 3 compared the experiences and perceptions of preceptors and staff at the existing DTPs. The findings emphasised the multifaceted landscape of clinical

education. Preceptors, who are experienced clinicians responsible for the supervision and teaching of students, often face the challenge of balancing clinical duties with educational responsibilities. In light of this, research has shown that preceptors who engage in continuous professional development perceive an increase in their competence and professional status, which may enhance their ability to support pedagogical development at their workplaces[101-103]. Although staff often report positive experiences with preceptorship, indicating that it meets expectations for professionalism and teamwork, complexities do exist due to the additional roles of the education of communication skills and patient advocacy. Effective communication is pivotal in patient-centered care, often hampered by systemic and interactional barriers. Moreover, the cultural context can influence the priorities, challenges, and scope of clinical communication teaching, necessitating a dynamic and culturally sensitive approach to education. In summary, while preceptors and staff may have differing experiences and perceptions of preceptorship, the overarching goal remains to foster an environment conducive to the development of competent healthcare professionals who are adept in communication and patient advocacy.

Objective 4 explored medical student experiences at the existing DTPs. Findings from focus group discussions highlighted invaluable experiences that are critical to their development as healthcare professionals. Through direct patient interaction, students can hone their communication skills, develop empathy, and gain a deeper understanding of the diverse needs and experiences of patients. This hands-on learning environment allows them to apply theoretical knowledge in real-world settings, fostering critical thinking and problem-solving skills. Moreover, these experiences can profoundly impact their future practice, as they learn to navigate the complexities of patient care and the healthcare system. These insights gained from clinical rotations are instrumental in shaping competent, compassionate, and patient-centred healthcare providers. Analysis of the log diaries confirmed assumptions and anecdotal evidence that medical students often find themselves immersed in a rigorous curriculum, where clinical activities take precedence. This focus is crucial for developing hands-on experience in diagnosing and treating patients, which forms the backbone of medical practice. However, community-based activities are also essential, providing students with a broader perspective on patient care, public health, and the social determinants of health. Balancing these two aspects can be challenging, but it is important for producing well-rounded physicians who are as adept at interacting with communities as they are at clinical problem-solving. Engaging with community activities not only enriches the students' educational experience but also instils a sense of social responsibility and empathy towards the diverse needs of the population they will serve.

8.2 Discussion

The discussion of the findings of the thesis starts with a discussion of a conceptual framework as it provides a structured approach to interpret the findings comprehensively. Framing the conceptual framework in the beginning is essential for linking the findings together to provide a comprehensive *understanding of a phenomenon*[104] in this case the utilisation of DTPs.

8.2.1 Conceptual Framework

Using the *Community of Inquiry* (CoI))[105] and *Context, Input, Process and Product evaluation model* (CIPP)[106], this thesis examined the utilization of DTPs in four South African universities. The educational experience of medical students through the lens of cognitive presence, social presence and teaching presence was evaluated using the CoI. Augmenting this understanding, the CIPP model offered a systematic method for a detailed examination of the context, inputs and processes of the DTPs and their programmatic components.

Integrating CIPP[98] and COI[106], to explore the findings of this thesis, has led to a more holistic understanding of DTPs, as an educational initiative, enabling future educators to make informed decisions based on a wide range of data sources and perspectives. Moreover, this comprehensive study demonstrates how educators can ensure that their evaluations are not only focused on outcomes, but also on the processes and community aspects that contribute to those outcomes, facilitating continuous improvement and accountability within educational programmes.

By making use of these established models, namely the CIPP and COI, and combining them into a single conceptual framework in evaluating DTPs, we are able to respond to evidence requests in educational practice, influence policy, and strengthen practice across national stakeholders. This is further supported by the studies in our South African context that explored the use of distributed and decentralised teaching platforms[25, 107-109]. The interpretations derived from this thesis, presented below using the conceptual framework (Figure 2), provides additional guidance to adopting this approach in future studies.

8.2.2 The typology of DTPs at the four selected universities

The typology of DTPs at four universities was described through addressing objective 1 in exploring implications of these training platforms for universal healthcare coverage. Universities in SA have been required to find alternative training platforms in light of the educational and institutional landscape changes in recent years[110]. DTPs in medical education have been established to address the need for a more diverse and inclusive approach to

healthcare training. These platforms have also allowed for the expansion of the learning platforms. This transformative approach, expanding the teaching environment beyond traditional academic settings to include primary healthcare facilities and district hospitals[111], aligns with the global shift towards universal health coverage. This shift promote social accountability and ensures that medical students gain practical experience in a variety of healthcare contexts[20]. Moreover, DTPs support the development of a workforce that is better equipped to meet the needs of different communities, particularly in rural and underserved areas[112].

As a result, at the institutions included in this thesis, DTPs have changed from using urban based facilities to rural based sites. As DTPs are away from the main campus and a lecture room environment, being placed to learn in the local environment brings an opportunity to understand the environment in which the patient lives. DTPs offer significant benefits for rural areas, particularly in enhancing access to quality education. They can break down geographical barriers, allowing students in remote locations to connect with educators and resources to which they would otherwise not have access. The transformative medical education system acknowledges the role that DTPs play as a means of meeting the requirements of the community and producing qualified medical practitioners who understand the patient within the context where healthcare is delivered. It can therefore be argued that DTPs provide a learning environment in the context of place (rural platform), participation (community of practice) and enhances students' clinical learning[113].

DTPs offer a community-based environment to facilitate learning based on considering both curricular and community-desired outcomes. Teaching medical students about the social determinants of health, education philosophy places a major emphasis on partnerships with communities and health facilities, emphasizing the need for social accountability. The findings in this thesis demonstrate that the philosophies in medical education can be practiced within the curriculum in a tangible way that contributes to the students' learning while at DTPs.

While the institutional characteristics such as governance and leadership have remained the same over recent years, the organic evolution of DTPs and the relationships with the community has experienced numerous changes. These changes have most likely been as a result of the poor community -university relationships. While studies speak to the ongoing stakeholder collaborations and engagement in the co-development of programmes, the universities included in this thesis demonstrated huge shortcomings in the partnerships in which they were engaged

[114-116]. There was no evidence of engagement with DTPs in the design of both programs and curricula. Additionally, design and re-design of training programmes, social considerations, and institutional vision for healthcare delivery were explored at an institutional level.
While my findings from the published paper in Chapter 4 allude to the impact of the changing political climate and the Department of Health relationships with universities on DTPs, the importance of investment in decentralised medical education remains an ongoing investment from institutions. Ongoing training and sustainable human resources cannot be overstated. Where I identified investments, they were inclusive of infrastructure, information technology, transportation for students to these sites, human resources in the form of joint appointments or preceptors, and financial resources in the form of grants, university investment and donations. These need to be sustained.
I conclude that the success of DTPs in the context of universal healthcare requires consistent investment in building and maintaining relationships among universities, national and local departments of health, and communities. Finally, the intellectual investment through continuous professional development of staff and preceptors will further strengthen the potential impact of DTPs.

8.2.3 The teaching or learning objectives at the DTPs

Guided by the conceptual framework for this thesis, the methodological approach to generating an in depth understanding of the curriculum strengthened the rigor of the thesis. Using findings from a document review of DTPs curricula at the four universities, the teaching and learning objectives were triangulated with data collected in thesis. This included comparison with standard national guidelines, student logbooks, portfolios, clinical case studies, case scenarios, simulated learning tools, clinical procedures, and video presentations. I adopted this strategy to reduce bias and enable cross-verification of data by corroborating information gathered through various approaches such as key informant interviews, preceptor interviews, and student focus groups about the teaching and learning objectives at the DTPs, and the document review.

8.2.4 The learning objectives in the curriculum documents

The WHO has recommended that health professional education and training institutions should transform student selection, curricula, and educational pathways to meet the healthcare needs of communities[117]. In this thesis, I explored the different curriculum alternatives in place at the four universities to deliver the same learning objectives. The curriculum delivery takes form in the integrated primary care block which usually lasts for about 8-12 weeks at the same facility in the final year of study. All four universities share a similar stated objective to produce graduates who are

fit-for-purpose and able to deliver comprehensive primary health care delivery, mostly in rural areas where there is a shortage of health professionals. The reason for the common learning outcome for the integrated primary care block across all the institutions was to develop key competencies essential for delivering quality healthcare as mandated by WHO. There was variation in the focus on what the key competencies are in each of the institutions in this study. The findings from reviewing the documentation revealed that the learning outcomes are not explicit for students and preceptors. Explicit learning objectives are crucial as they provide a clear direction similar to a roadmap for both preceptors and students, outlining what is expected to be learnt and how to successfully achieve these goals. This can facilitate deeper engagement with the learning process[118]. By setting explicit objectives, educators can design their instruction methods and assessment tools to align with these goals, ensuring that teaching is focused and coherent. Moreover, explicit objectives facilitate the measurement of student progress, allowing for timely interventions when necessary. They also empower students by making the learning outcomes transparent, which can enhance motivation and engagement. In essence, explicit learning objectives are foundational to effective teaching and meaningful learning experiences. Balmer et al. (2013) support efforts to shape the explicit curriculum and guide students' learning experience within the boundaries of curricular objectives[119]. Balmer et al. (2015) also argue the need to broaden the understanding of the medical education curriculum and help educators tap into a wealth of underused educational opportunities for important clinical topics [120].

I found that the activities to support the learning at DTPs were not reflected in the course outlines or logbooks provided to students. Capturing the learning activities in curriculum documents is a fundamental practice in educational design and delivery. Capturing the objectives explicitly in written format serves multiple purposes: it provides a clear roadmap of the educational intentions, outlines the expected learning outcomes for students, and ensures alignment between teaching activities and assessment strategies. Objectives guide educators in planning and executing lessons that meet specific educational goals, and they help students understand the expectations and the skills they need to develop. Moreover, well-defined objectives are essential for evaluating the effectiveness of the curriculum, facilitating necessary adjustments, and maintaining educational standards. In essence, they are the benchmarks against which the success of the educational process is measured. Harden et al. (1999) support the notion that capturing learning objectives in an outcome-based curriculum encourages an integrated approach to medical education [121]. Institutions need to capture well-defined objectives that serve as a guide to ensure that the curriculum remains relevant and comprehensive, preparing students to meet the challenges of the 21st century.

8.2.4.1 Absence of a teaching philosophy that underpins the medical curriculum

The underlying philosophies of medical education are deeply rooted in the principles of social accountability, partnership and responsiveness to community needs. Social accountability mandates the alignment of educational objectives with the health needs of the community, ensuring that medical professionals are not only skilled clinicians but also empathetic agents of change within society[122]. This process of working and learning alongside these clinicians is integral to the formation of a professional identity that is both person- and community-oriented, fostering a commitment to service and ethical practice in future physicians[123]. The WHO, 2021, page 12, defines social accountability as "the obligation of health science faculties to direct education, research and service activities towards addressing the priority health concerns of the community"[124]. The priority health concerns that are to be identified jointly by governments, health care organisations, health professionals and the public"[125] are not explicitly stated in the curriculum documents reviewed within this thesis. This indicates a need to review curricula to ensure alignment with the burden of disease.

Professional bodies that determine the structure of curriculum development for health professions education, like the HPCSA, Academy of Science of South Africa (ASSAf) and WHO propose teaching philosophies that will form the foundations on which our transformative curriculum is developed. The philosophies include teaching methodologies like problem-based learning, community-based education, interprofessional education, social accountability, and the social determinants of health. These philosophies draw out the values in medical education, like equity, responsiveness, and patient advocacy that we aim to develop as part of graduate attributes. These teaching philosophies were absent in the reviewed curriculum documentation.

I found that the focus on the social determinants of health formed the basis of the curriculum yet there was an absence of the bio-psycho-social approach to healthcare that views health from the individual, family, and community perspectives. Key principles of patient-centeredness were also missing. This disconnect between the principles and values was surprising as the essence of PHC speaks to a practice that demonstrates not only responsiveness to the patient but also a person-centered approach to the delivery of care in a collaborative way.

This perspective on care and collaboration is essential for building effective teamwork and fostering an interprofessional learning experience. It involves understanding and integrating the various complexities of healthcare, as well as the diverse roles and expertise within a team. This approach enhances the ability to adapt to the evolving needs of patient care and supports the development of

cohesive interprofessional teams that are equipped to manage complex care scenarios. Moreover, it encourages continuous learning and improvement among healthcare professionals, leading to better patient outcomes and a more efficient healthcare system. Doyle et al. (2021) argue that this approach provides for better learning interactions in teams when managing patient care [126]. As these methods contribute to a more comprehensive and practical medical education it is important that students learning at DTPs also can work in teams and along with other students. This was absent in the curriculum documentation.

8.2.4.2 Absence of the principles of Primary Health Care (PHC)

The principles of Primary Health Care (PHC) emphasise a holistic approach to health, focusing on the comprehensive and interrelated aspects of physical, mental, and social well-being. This approach is rooted in equity, social justice, and the understanding that health is a fundamental human right. It involves not only medical treatments but also encompasses health promotion, disease prevention, rehabilitation, and palliative care, aiming to bring healthcare services closer to the community. The shift from a purely curative paradigm, often associated with the biomedical model, to a preventative approach aligns with the biopsychosocial model. This model integrates biological, psychological, and social factors in understanding health and illness, recognising that these elements interact and influence individual well-being. The biopsychosocial approach acknowledges the complexity of health determinants and the need for a more inclusive, equitable, and cost-effective way to achieve universal health coverage. It represents a move towards systems designed for people, with a focus on patient self-awareness, relationships with healthcare providers, and the individual's life context, which are essential for a more effective treatment and health maintenance strategy. In the curriculum documents there were limited learning activities for students to practice health promotion, disease prevention, rehabilitation, and palliative care competencies with a strong emphasis being placed on clinical skills limiting the shift from the curative paradigm. The shift for the strong clinical skill training focus is a paradigm shift needed to maintain global standards in medical training [127, 128]. This shift supports the production of graduates who are fit-for-purpose and able to deliver comprehensive primary health care and optimises the learning opportunities at DTPs. Existing evidence suggests that the incorporation of DTPs and more situated learning within the curricula is an important educational strategy to achieve curriculum transformation. While models of DTPs in Australia[129], Brazil[130], Canada[131], the Philippines[132] are well documented, in South Africa our DTP models are undefined. In documented work, DTPs have enabled medical graduates to develop the competencies to provide quality patient-centred care and address complex and changing health care needs of communities. Frenk et al. have argued that transformative learning and mutual dependence in medical education is necessary[5]. Having opportunities for service

learning and incorporating the key principles of the PHC approach into a decentralised teaching environment provide the transformative learning that is required[8]. These principles of PHC were absent in the curriculum documentation.

8.2.5 The experiences and perceptions of preceptors and staff at the existing DTPs.

The findings for objective three related to preceptor and staff experiences, these were analysed from the interviews in relation to the conceptual framework described earlier in this chapter. Analysis of the interviews highlighted the essential role of preceptors in influencing the upcoming cohort of healthcare providers through mentorship, hands-on experience, oversight, and leadership training in clinical rotations. As final-year students, it is important that at DTPs, preceptors familiarise students with the practice environment, and that they learn to develop clinical tasks by collaborating closely with preceptors, aligning them with course objectives. This teaching responsibility was understood by all preceptors.

Preceptors at DTPs have dual appointments, working for both educational institutions and the Department of Health or healthcare facilities. The duration in the role as a preceptor varies from one week to eight years, despite high staff turnover and instability. Preceptors provide supervision, teaching, guidance, and evaluation of students, but often struggle to balance clinical duties with educational responsibilities. Clinical supervision in preceptorship involves teaching communication skills and patient advocacy, which are crucial for patient-centered care. Preceptors' role-model these competencies, forming part of students' professional identity. They understand cultural context and provide a supportive learning environment. No training is provided for their educational responsibilities, and they receive no formal induction training. Continuous professional development is essential for preceptors to enhance their competence and support pedagogical development[101, 103, 133]. Collaboration between educational bodies and health departments is needed for ongoing professional development.

8.2.6 The medical student experiences at the existing DTPs.

Focus group discussions with students from all four universities under study informed the conclusion of the analysis for this objective. DTPs offer medical students a learning environment that allows them to apply theoretical knowledge to practical situations and helps them develop their professional identities. Medical students can develop a deeper understanding of their professional identities and highlight the advantages of service learning by reflecting on their

learning experiences. DTPs were designed to enhance the learning experience and complement traditional academic hospital settings.

Students expressed gratitude for the unique and enriching experiences that learning in a rural setting provided. Students developed a strong sense of participation and belonging because of the close-knit community and surrounding natural surroundings. An awareness of teamwork and collaborative practice was created by the DTP staff and preceptors' assistance. The staff's involvement was essential in establishing a welcoming and supportive learning environment. Integrative learning, reflection, and professional identity are critical components of undergraduate education[134]. In the analysis of these focus groups, I was aware that there is a need for recognising knowledge gaps, encouraging self-directed learning, and building a professional identity via diverse experiences and reflections Students are encouraged to approach their studies with a self-directed manner when they are on rotation. Consequently, the conduct exhibited by DTP preceptors and facilitators shapes their role-modeling and effects the learning for students supervised by these preceptors.

Across the various DTPs, student expectations varied. The vagueness of the stated learning objectives was the reason of the differing expectations. Examining the learning objectives made it possible to look at how the preceptor at the site, the institution sending the students, and the students themselves perceived the different learning outcomes. The preceptors observed that although students had a logbook to accompany them and direct their learning activities, they frequently did not know what was expected of them. In order to help students grasp the links between the material and the importance of practicing it in an integrated manner, further explanations are needed. Students' experiences at DTPs displayed their negative emotions of being overburdened, nervous, and in need of help.

8.2.7 Factors impacting on the learning experiences.

The impact of site-related aspects such as living conditions, resources, and logistics on the overall experience of placement in DTPs was noted. Many negative experiences were linked to the living conditions of students and the limited resources at DTPs. While living circumstances and limited resources can lead to negative experiences, the impact DTPs bring to enhance the understanding of the patient and community is of far greater contribution to students learning. According to the collective experiences expressed by students they adjust to the inconvenient living conditions and limited resources and learning outcomes are achieved.

Augmenting the analysis of the focus group discussions, this study evaluated the logbooks of students at the four universities. In the undergraduate medical curriculum, logbooks serve as an essential tool for recording the teaching and learning activities of students. Logbooks provide an itemised list of skills and procedures that are carried out. In the study, log diaries from 32 sites, (comprising of three PHC facilities and 29 rural sites) recorded time spent on different activities while students were on rotation. This was done to better understand if the aims of the curriculum were being carried out. The log diaries students completed provide insight into how time was spent according to clinical time, teaching time, skill time, community time, and free time. Skill time refers to other skills like communication, teamwork, patient advocacy, professionalism, conflict management, and research. All these skills are essential graduate attributes needed for a well-rounded health professional.

Analysis of the 60 students' log diaries from four universities indicated that the clinical time they engaged in held greater perceived value compared to the teaching time, skill time, and community time. This finding confirms the clinical skill focus the curriculum emphasizes from the curriculum documentation reviewed in objective two of this thesis. In the diary, students were given the opportunity to rate the perceived value of skills acquired during their time at the DTPs. Students rated a perceived low value in areas such as communication, problem-solving, and advocacy skills. Their belief that communication was unnecessary is a crucial indicator of their attitude towards interacting with patients, especially if they perceive communication as having a low value. Students reported that they spent large amounts of time on clinical activities when compared to community-based activities. This discrepancy ranged from 46.0% (clinical) - 0.00% (community-based).

The learning, time, and activities identified did not demonstrate full use of the potential that DTPs may offer to the curriculum. During an eight to ten-week placement, students can observe the living conditions and backgrounds of patients, but they do not physically visit the community. This is an opportunity that presents the chance for students to see the context in which their patients live. These findings contradict the experiences of undergraduate medical students at rural district hospitals and health care centres in the Western Cape Province, South Africa who used a log diary study to demonstrate the opportunities for students to develop both clinical and practical skills while completing a rotation in resource-limited settings[135].

8.2.8 Triangulation of data across institutions

Demographics of preceptors presented in Table 2 in Chapter 7 shows a slightly higher representation of males, with an age range of 44 to 60 years. Most participants have less than 5

years of service, indicating a mix of newer professionals entering academia. The remaining participants have over 5 years of service, reflecting a balance between experienced and less experienced individuals.
University representation varies by university, with UKZN having a stronger representation of experienced individuals. WSU has a balanced mix of experience levels, with two participants having less than 5 years and two exceeding 5 years. The University of the Witwatersrand has a diversity in tenure, with one participant having over 5 years. Emerging patterns include age vs. experience, institutional focus, and gender and experience. The study suggests that women are represented in both tenure categories but have slightly higher representation in the >5 years group.

Data reported on in published paper *using log diaries to examine the activities of final year medical students at decentralised training platforms of four South African universities*, presented in Chapter 5 compare experiences across the four universities.
The allocation of clinical practice time varies across the four institutions. Institutions with a strong emphasis on clinical practice have allocated more time to hands-on training, while those with a greater emphasis on research or theoretical knowledge have allocated less time to clinical practice. Some institutions adopt a competency-based curriculum, ensuring students develop clinical skills throughout their education. Others may emphasise theoretical instruction in the initial years, reserving clinical practice for later stages. Resource availability, such as access to hospitals, clinics, and preceptors, significantly influences clinical time. Specialised focus areas, such as surgery or paediatrics, may concentrate clinical time on specific disciplines, resulting in focused but narrower clinical experiences. This results in skill development, critical thinking, and preparedness for practice. It remains however crucial to align programme design with institutional goals and healthcare needs to ensure effective training.

Achieving an even distribution of time spent on activities of daily living (ADLs) across four institutions concurs the promotion of holistic learning experiences, improvement of time management skills, and equitable access to resources and opportunities. Balanced ADL engagement, which fosters life skills like self-care, productivity, and well-being is similar across the institutions. This equitable access to resources and opportunities, regardless of geographical or resource disparities is clear. Institutions can implement this by integrating specific hours for ADLs into timetables, monitoring and feedback to identify disparities, and promoting collaborative workshops to encourage shared strategies for managing ADLs. Indicators of

balanced engagement include improved focus, reduced burnout, higher academic performance, improved student well-being metrics, and higher retention and satisfaction rates. This distribution requires careful planning, student input, and institutional collaboration to create an environment where students thrive academically and personally.

8.2.9 Summary of Key findings of the thesis

Table 2 summarises both the inter-related and inter-dependent key findings of this study in relation to the conceptual framework. For each paper emanating from the thesis the key findings provided for triangulation of the data.

Table 2: Summary of PhD Findings.

Conceptual Framework	Paper 1	Paper 2	Paper 3	Paper 4
Context	The changing context of medical education and global and national imperatives for the transformation of institution's history, evolution, political and social factors, and institutional vision for healthcare delivery, and the transformative agenda for curriculum change. Transformative medical education recognises DTPs as a vehicle to address community needs and produce competent medical doctors. DTPs have changed over the years, with PHC clinics being the predominant DTPs.	Students recorded low amounts of time on skill acquisition and low amounts of time spent in the community.	The experiences of students at DTPs, revealed their need for support and highlighted negative feelings such as being overwhelmed, uncertainty, confusion, depression, and exhaustion. On the other hand, where students felt they were treated like doctors, this enhanced their enjoyment levels of being at DTPs. The impact of site-related matters such as logistics, resources, and living conditions impacted on the overall experience of placement at DTPs. Most negative experiences were linked to student living conditions and limited resources at DTPs.	Preceptors/ facility staff not formally induced to role by institution/medical faculty.
Input	Length of time in portfolio (position as Head of Department) varied from two years to over 30 years. Senior academic is responsible for teaching and learning undergraduate health sciences students. A mix of DTPs in urban, informal settlements, and rural areas, dependent on availability and proximity to the main campus. These DTPs include community visits, PHC facilities, and district hospitals.	Similar proportions of time on daily living activities Educational activities of great value ranged from 9.7% at Wits to 60.3% at WSU.	The curriculum at various DTP sites is inconsistent, with students experiencing varied experiences and expectations. The structure of the curriculum, including the year of study, length of stay, and clear learning objectives, varies across institutions. The variations in expectations and lack of clear learning objectives were noted by participants. The learning experience at DTPs provided opportunities for students to acquire and practice the necessary skills for their degree. Major development in clinical skills, with competent delivery by facilitators and a system-focused, biopsychosocial approach. Developed skills related to effective patient interaction, better patient management, and addressing patient needs. Recognition of patients' trust in the delivery of care. Personal development and improved communication skills.	Length of time in position as preceptor varied from one week to 8 years.

			The holistic approach and communication skill development contributed to a sense of achievement as a result of the learning experience.	
Process Indicators	Investments in decentralised medical education and training, including infrastructure, information technology, transport, human resources, and finances are vital. Financial investments through government grants, university investments, and donor funding. Joint appointments between universities and the Department of Health at DTPs. The importance of investing in relationships, particularly with provincial government health departments, and intellectual investment in DTPs.	Clinical activities were of some or high value across the four universities. 19.5% (WSU) and 31.7% (Wits) of their time on teaching activities at the DTPs, including self-directed learning. Further research is needed to determine why so little time was reportedly spent on PHC and community-based activities during the IPC rotation.	Student engagement in various activities during their placement, including unscheduled holiday work, health promotion, and health and environmental systems-related activities. Focus on developing clinical and procedural skills within healthcare facilities. Work/Learning in various sites, including primary health care clinics and district-level hospitals, allowing opportunities for community work. Frequency and organisation of community activities were also discussed. Addressing the resource constraints at DTPs and suggestions for improvements for the learning environment and logistics.	The sustainability of appointments is questioned due to the lack of control of universities and confusion about the roles of preceptors
Product Indicators	Product indicators not analysed for this study.			
Social Presence				Patients and communities are happy with the services provided by staff and students and often express a desire for more service reported by preceptors.
Cognitive Presence		Variations in the time spent on clinical activities,	Development of professional identity through exposure and reflection, identifying knowledge gaps and supporting self-directed learning.	Preceptors/Facility staff have primary role as clinicians.
Teaching Presence	In the curriculum the underlying medical education philosophies are implicit and while varied teaching approaches, including standard national guidelines, logbooks, portfolios, clinical case studies, case scenarios, simulated learning tools, clinical procedures, and video presentations learning are structured.		Learning was facilitated or hindered by various factors at DTPs, such as clinical skill development, communication, and patient management. Barriers to learning, such as the role of site facilitators and their role in student supervision. The facilitator's role is crucial for faculty, student, and patient relationships, and their interactions impact students' learning.	
Educational Experience		Time spent on clinical activities, teaching activities, and advocacy skills among final-year medical	DTPs offer medical students a learning environment that allows them to apply theory to practice, providing insight into professional identity formation.	Limited support to align curriculum objectives with expectations for preceptors and facility staff.

		students at four South African universities		
Supporting discourse	Community engagement, community-based education, and social accountability, as well as teaching medical students about the social determinants of health underpin the education philosophy with a strong focus on relationships with communities and health facilities.	Reported very little time spent on practicing or learning new skills, such as clinical, communication, decision-making, problem-solving, and advocacy skills	The Human Resources and Health (HRH) sector requires improvements in education and training for medical students preparing to enter the workforce. Contribution to the added value of exposure at DTP sites, can address workforce scarcity and enable trainees to acquire competencies and values needed to provide care in local communities. Leveraging facilitators and addressing these barriers could lead to a workforce contributing positively to the HRH crisis.	
Regulating Learning		Spending less than 1% of their time on community activities is concerning, as the transformation potential of DTPs lies in immersion and exposure to communities, developing relationships with communities, learning about the social determinants of health, encouraging students to return to rural and underserved areas, and having a greater commitment to social accountability.	Reflection of the experience of learning for medical students provides insight into professional identity formation and highlighting the potential benefits of service learning.	
Setting/Climate		Community activities were not included in the study, with students spending less than 1% of their time on community activities.	DTPs developed to supplement traditional academic hospital settings and add value to the learning experience. Student living conditions and limited resources contribute to negative experiences, but they also drive students to optimize and solidify learning opportunities.	Teaching role alongside core work role as clinician, resulting in strong clinical focus and role-modelling.

8.3 Chapter Conclusion

In this chapter, I have proposed a framework called ReActive Progressive Transformative (RAPT) to categorize decentralised training platforms based on geographical setting, interprofessional education, characteristics, and educational philosophy. The RAPT framework aims to assess and plan DTPs, with a focus on educational transformation.

9 CHAPTER 9: THE CONCLUDING CHAPTER

This thesis and its findings have notable implications on the future of DTPs in South African medical education. The thesis emphasizes the importance of equipping students with essential competencies, the role of preceptors in supporting learning, and the valuable experiences students gain in DTPs. I adopted a comprehensive conceptual framework for evaluating DTPs, highlighting their impact on expanding medical education and promoting social accountability in healthcare. The findings stress the need for integrating Primary Health Care principles in curriculum design and continuous investment in DTPs for sustainable healthcare workforce development. Furthermore, the result of this thesis underlines the significance of partnerships between universities, health departments, and communities to achieve universal healthcare goals.

Objective 1 outlined the common characteristics of Distributed Teaching Practices (DTPs) used in four universities, focusing on their financial and human resource requirements. The thesis showed how DTPs help students better understand patients and their backgrounds

Objective 2 involved reviewing the teaching objectives of DTPs within and across the institutions, revealing an emphasis on critical competencies like critical thinking, evidence-based practice, and clinical application. Despite curriculum differences, there is a shared goal of equipping students with core skills for healthcare practice.

Objective 3 delved into the experiences of preceptors and staff at DTPs, highlighting the challenges they face in balancing clinical duties and education, and the importance of continuous professional development. Effective communication and patient advocacy are crucial in shaping competent healthcare professionals.

Objective 4 explored medical students' experiences at DTPs, showcasing the benefits of hands-on patient interaction in developing communication skills and empathy. The findings emphasized the importance of balancing clinical activities with community-based experiences to create well-rounded physicians with a deep understanding of patient care and societal health needs.

This thesis recommends the use of the fit-for-purpose RAPT framework for the categorization of DTPs by universities. In addition, several recommendations were made, including:

- Effective leadership and governance are crucial for successful decentralised training programmes.

- Investment in leadership development, teaching expertise, and human resources is essential for quality educational environments.
- Tracking graduates after completion of training is important to assess preparedness for the work environment and support workforce development.
- Developing a knowledge base and aligning curriculum objectives are necessary for decentralised training programmes.
- Institutions should leverage decentralised training platforms to provide diverse clinical exposure and promote social accountability.
- Legislation and education policies should support the integration of decentralised training in medical education.
- Technology can facilitate remote learning and hands-on experience in healthcare environments.
- Students and preceptors play important roles in decentralised training, and feedback mechanisms are needed for continuous improvement.

9.1 Research Outcome, Strengths, Limitations and Recommendations

9.1.1 A framework for categorisation of transformative decentralised training platforms

The **ReA**ctive **P**rogressive **T**ransformative (RAPT) framework for the categorisation of DTPs is a proposed framework emanating from the study and analysis of the data. The RAPT framework is my scholarly contribution. The components of this framework was drawn from the study findings a possible framework to categorise decentralised training platforms.

The RAPT framework- provides a valuable framework for assessing and planning DTPs across various domains and across different contexts. This proposed framework has the potential for users to analyse DTP sites and the institution making use of the site as an expanded learning platform and the impact on educational transformation.
RAPT incorporates indicators derived from the data collected in this thesis from key informants, document review, curriculum documents, preceptors, students, and staff. These indicators cover various aspects such as setting, educational philosophy, stakeholder relationships and investments, characteristics, and more. (Figure 8)

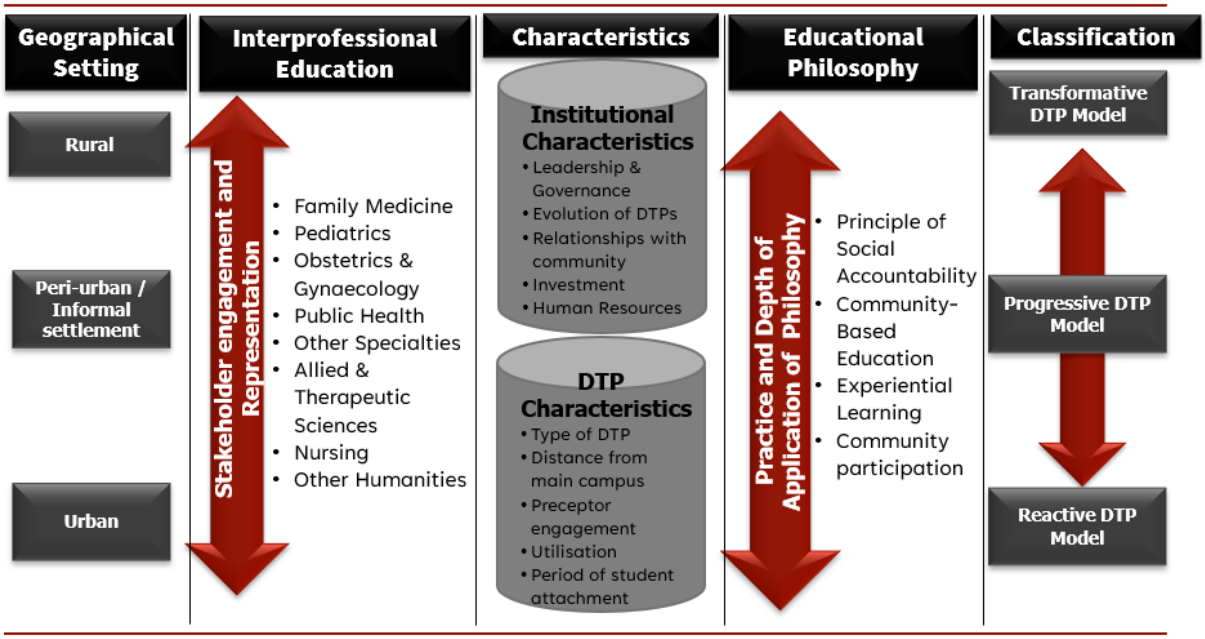


Figure 8: A framework to categorise decentralised training platforms

The **geographical setting** refers to the location of the DTP. The location could be urban based (closest to city and main campus), peri-urban (outskirts of the main city or closest to marginalised settlements) or rural (furthest away from main campus, in remote setting) as illustrated in column one.

Interprofessional Education refers to the level of stakeholder engagement and representation of the different healthcare professions. The presence of multiple disciplines such as Family Medicine, Paediatrics, Obstetrics and Gynaecology, Public Health, Allied and Therapeutic Sciences, Nursing and other Humanities using the site at the same time allow for students from two or more professions to learn together during certain parts of their education to cultivate collaborative practice for providing patient-centered care. The goal of IPE is to prepare healthcare students to work as a part of an interprofessional team, enhance the quality of patient care, and improve health outcomes by learning to collaborate with other healthcare professionals illustrated in column two.

The **characteristics of DTPs** are divided into the ***institutional characteristics*** that support the DTP as a learning environment comprising of the leadership and governance from the institution, the evolution of the DTP site based on the number of years the site has been used over time by the institution, the relationships with the community, the financial investments the institution has put into the development of the site and the human resources the institution or other stakeholders have invested in the site. The ***DTP characteristics*** refer to all the characteristics pertaining to the DTP site itself like the type of DTP, its distance from the main campus, identified preceptor engagement, how often the site is used for various student

rotations and the length of time students are placed at the site for rotations illustrated in column three.

The **educational philosophy** refers to the practice and depth of application of educational philosophy. Education philosophy practiced with the medical curriculum include social accountability, community-based education, experiential learning, community participation, transformative learning to name just a few of the more commonly practiced philosophies at the studied universities. The integration of educational philosophy into medical curricula is pivotal for shaping healthcare professionals who are not only skilled but also reflective and ethically grounded. The philosophies emphasize the importance of aligning medical training with societal needs and engaging with communities directly. Experiential learning and transformative learning focus on the depth of understanding and personal growth, preparing students to adapt and innovate in their future practice. These philosophies, when applied effectively, contribute to a more holistic and responsive medical education, ensuring that future healthcare professionals are well-equipped to meet the challenges of their profession illustrated in column four.

Collectively these four considerations result in a **site classification** that could be divided into three different levels, a **R**e**A**ctive, **P**rogressive or **T**ransformative level. The transformative level being the golden standard and higher level of classification for a DTP site encompassing the highest level of the four considerations present as illustrated in column five. Most DTPs in the study presented progressive DTP classification on consideration.

This typical example can be explained to have been in a rural geographical setting with possibly two to three disciplines represented in their interprofessional education approach, encompassing a few characteristics in their description with limited depth and application of three educational philosophies. This would classify the site as a progressive DTP model as illustrated in figure 9 below.

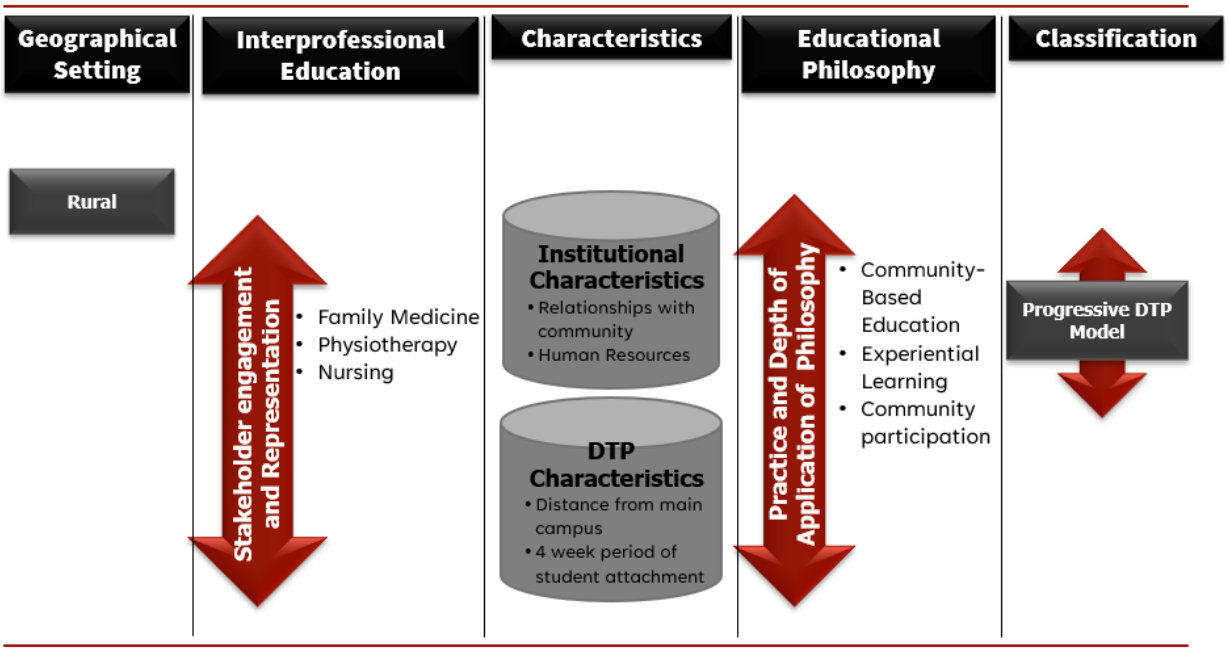


Figure 9: A typical example of the framework applied to catergorise a DTP site

RAPT emphasises a "whole-of-community approach" to DTP planning, recognising the various stakeholders who play a role in the site as an expanded learning platform. The framework has the potential to be incorporated as a Balanced Scorecard, an effective strategy tool that helps institutions align their DTPs with the strategic objective of transforming medical education in our learning environments.

9.2 Strengths and limitations of the thesis

9.2.1 Strengths of the thesis

The major strength of the thesis was the development of the proposed RAPT framework. The exploration of the typologies of DTPs categorising variables from the data, resulted in the development of this proposed framework. This framework was formulated as the ReActive Progressive Transformative (RAPT) Framework. This framework has the potential to serve as a valuable tool for assessing and planning DTPs, enabling a structured approach to evaluate the progression and transformation potential to strengthen existing DTPs. This framework could guide current reviews of DTPs and support the expanding learning platforms for medical education.

In the document review it was evident that the learning objectives are not explicit. No prior document review has been applied in other studies on DTPs as a form of triangulation for the data collected. Explicit learning objectives are crucial in curriculum documentation as they define the intended outcomes of education, providing a clear direction for both teaching and

assessment. They articulate the knowledge, skills, and attitudes that students are expected to acquire, thereby aligning educational activities with desired goals. Furthermore, explicit objectives facilitate the evaluation of student progress and the effectiveness of the curriculum itself. In essence, they serve as a roadmap for educational success, ensuring that all stakeholders have a common understanding of the expectations and standards of the academic programme. A recommendation is that curriculum documentation is reviewed to explicitly articulate the learning objectives.

A further strength of the thesis was the review of how time is spent by students. While students have historically made use of logs to record procedures carried out, no logs have recorded how time is spent. Time management during rotations is crucial in a demanding undergraduate medical programme. The use of log diaries to understand how time is spent by students at DTPs serves as a tool for reflection and accountability and allows students to track their activities and review their time allocation. This novel method can lead to improved efficiency and goal attainment by identifying patterns and areas for improvement. The practice of maintaining a log diary and recording how time is spent can encourage a structured approach to activity management and can be instrumental in transforming tangible learning outcomes for the undergraduate medical programme.

9.2.2 Limitations of the thesis

A limitation of the thesis was the selection of DTPs that represent the spectrum of DTPs. The selection of the DTPs currently used by the four universities was constrained by the availability of current sites being active DTPs at the time of data collection. Some sites were not active due to the unavailability of preceptors, deeming those sites out of use. A purposive sample of sites was identified to represent one urban, one peri-urban and one rural site in use across all the universities in the study. This provided a balanced representation for comparison. Twelve DTPs did provide valuable and in-depth information on types, similarities and differences across the DTPs used at the four universities. However, it may not be possible to generalise the findings to all DTPs at the four universities or to South Africa as a whole.

The observation data collected

Integrating additional frameworks in various domains like education, technology, and management would have been beneficial. Such frameworks would have highlighted the complexity, resource constraints, context dependence, measurement and evaluation challenges, and innovation stagnation in this study. However, a risk of confusion would have arisen from relying on too many frameworks. To mitigate cross cutting analysis, this study prioritised the selected frameworks that aligned with

the specific needs and goals for this study to encourage feedback and iterative improvement processes for the future.

A limitation was the poor uptake of student participation from the institutions. At the time of data collection, two institutions had student boycott demonstrations which hampered recruitment of students. Support of the representative student structures was enlisted to encourage student participation.

9.3 Recommendations

9.3.1 Institutional recommendations

Effective leadership and governance at institutions are essential for successful DTPs to exist. At a faculty level, it is expected that institutional investment extends from merely infrastructure and logistical arrangements to investments in the human resource component. The investment in leadership development and teaching expertise programmes for academic staff and preceptors involved in decentralised training is crucial to ensure that DTPs are equipped to deliver good quality educational environments. With such investment, both educational environments, the DTP and the medical faculties or departments on campus are equitable.

9.3.2 Human resources recommendations

The use of DTPs in the training of undergraduate medical education should result in graduates exiting a programme well-rounded and equipped to function effectively in a health/community context. To provide evidence of this, graduate tracking measures need to be put in place and graduates need to be followed up after graduation. Data that should be collected after graduation would include the preparedness for future work environment, the value of competencies acquired during the placement while in training, location of work environment, and duration of service while in training to describe just a few examples of possible variables for graduate tracking. This could contribute to workforce development and support the retention of staff in underserved areas. To date, we still face the complex challenge of a global shortage of well trained, skilled, motivated health workers[117].

9.3.3 Curriculum recommendations

To better understand approaches to DTPs and their possible learning outcomes, there is a need to develop a knowledge base for developing a model for DTPs with the closer alignment of the curriculum objectives of decentralised training for undergraduate medical students in lower and middle-income countries (LMICs). In addition, the explicit learning outcomes need to be articulated in written form in the curriculum documentation.

9.3.3.1 *Institutional*

DTPs offer a flexible and inclusive approach to medical education, allowing students to engage with course material from various locations, including primary healthcare facilities, district hospitals, and community-based organisations. These platforms can enhance the training of undergraduate medical students by providing exposure to diverse clinical environments and patient populations, fostering a deeper understanding of community health needs. Institutions can leverage DTPs to promote social accountability and ensure that medical education aligns with the healthcare needs of underserved areas, ultimately contributing to universal health coverage.

9.3.3.2 *Legislation, education policies, and teaching*

To enhance the training of undergraduate medical students through decentralised training platforms, it is recommended that legislation is developed and implemented to encourage the use of decentralised training platforms within medical education. This could involve funding, infrastructure development, and incentives for institutions that integrate such platforms into their curriculum. Amend existing education policies to include mandatory components of decentralised training in undergraduate medical curricula. This ensures that all medical students gain exposure to diverse healthcare settings, which is crucial for a well-rounded education. Technology can be utilized to facilitate remote learning and hands-on experience in various healthcare environments. This could include virtual simulations and online modules that complement traditional learning methods. A framework should be established for the continuous evaluation of the effectiveness of decentralised training platforms.

9.3.3.3 *Students and preceptors*

DTPs offer a diverse range of learning environments, from primary healthcare facilities to community-based organisations, which can enhance the educational experience. The benefits of DTPs include exposure to a variety of healthcare settings, fostering a deeper understanding of community health needs, and promoting universal health coverage. Students should adopt a positive approach to being placed at DTPs when the opportunity arises. Preceptors play a crucial role in guiding students through these decentralised learning experiences, ensuring that they gain practical skills and knowledge relevant to their future careers in medicine. Feedback mechanisms need to encourage continuous feedback from students and preceptors to adapt and improve the platforms over time.

9.3.4 Conclusion

Strengths of the study include the development of the RAPT framework and the insight into learning objectives and time management. The RAPT framework- provides a valuable

framework for assessing and planning DTPs across various domains and across different contexts. This proposed framework has the potential for users to analyse DTP sites and the institution making use of the site as an expanded learning platform and the impact on educational transformation.

Limitations include the selection of DTPs and student participation issues. Recommendations include improving leadership and governance, tracking graduates, emphasising explicit learning objectives, developing curriculum models, encouraging legislative support, leveraging technology, and enhancing student and preceptor engagement in decentralised training. With these recommendations, strengths, limitations and the development of the RAPT framework, the thesis has achieved its stated objectives and contributed to the conceptual and theoretical discourse on DTPs in South Africa. Despite its transformative potential, continuous research and adaptations remain a gap for future research to address its challenges and call for the evidence of the effectiveness of training at DTPs.

Decentralised training platforms (DTPs) are increasingly recognised as valuable in the training of undergraduate medical students. Key factors for the successful implementation of DTPs include the availability of information and communication technology, continuous rotations, a focus on primary care, alignment with medical schools' missions, and responsiveness to student needs. By implementing these recommendations and continuing future research, medical education can be more inclusive, practical, and aligned with the evolving landscape of healthcare delivery.

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11 ANNEXURES

Annexure 1a: Participant Information Sheet

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

Introduction and background
Hello. My name is Abigail Dreyer. I am a doctoral student in the School of Public Health at the University of the Witwatersrand in Johannesburg. I am doing research on decentralised training platforms used for undergraduate medical education by the health science faculties at four universities in South Africa.

Why are we doing the study?
The aim of this research project is to collect information on decentralised training platforms used for undergraduate medical education, compare these training platforms, with the view to inform the transformation of medical education in South Africa. Your insights as Faculty management, academic or expert in the field, will assist greatly with meeting the study objectives.

What are we asking you to do?
We would like you to participate in a recorded interview which will take you about 40 minutes of your time. Your participation is voluntary. This is not a test, so there is no right or wrong answer. It is your opinions and experiences that are important. My role as an interviewer is to listen and to understand your point of view, but not to pass judgment. You may refuse to answer any questions that you don't feel comfortable answering. You may also say that you don't know the answer to a question.

Did you get permission to do the study?
Permission to carry out this project was obtained from the University of the Witwatersrand Human Research Ethics Committee. We have also obtained approval from the participating universities, and from the health care authorities.

Confidentiality
The information that you give in the questionnaire will be kept confidential. None of the researchers who work in this research project are staff members of any health care authority. Only members of the research team will know who has been interviewed. All interviewees will be assigned a code and these codes will be used on the transcribed interviews. These codes will only be known to members of the research team. We undertake that all information provided by you will be used only for the purpose of the study. Everything that you say will be treated as private and confidential. This means that apart from the person who asks you the questions, no one will know how you answered. Your name will not be revealed in any written data or report resulting from the study.

The answers given by participants will be combined and analysed to look for common themes and experiences. The combined information will be written up as an article, which will constitute part of the PhD thesis.

Consent
Permission to carry out this project was obtained from the University of the Witwatersrand Human Research Ethics Committees. We will ask you to sign an informed consent form, both to participate in the study and to record the interview. If you are willing to give your consent and

take part in the study, we will appreciate your participation and the information that you are willing to provide.

Benefits and risks of participation
Participation in this study is voluntary and there will be no direct benefits to anyone who completes the survey. Similarly, there will be no negative consequences for individuals who do not want to participate in the study. You will not be compensated for taking part in the study. You have the right not to answer any questions that make you feel uncomfortable or that you do not want to answer.

Recording the interview
We would like to request your permission to audiotape the interview because we cannot write down all your answers quickly enough and might miss some important things that you will say in response to some of the questions that you will be asked if we do not record them. The tapes and notes will remain confidential and your identity will not be disclosed. The only thing we are interested in is your honest responses.

The tape will be listened to by the researcher. Tapes of interviews will be transcribed and transcripts of interviews will bear the code and not the name of the interviewee. The information will then be discussed by members of the research team and organized into a report. The tapes will be kept in a locked cupboard.

Whom do I contact if I want more information?
We will be happy to answer any question you have about this study. The contact details for the HREC Chair/ Administrator for participants should you wish to escalate direct queries, concerns or complaints regarding the ethical activities surrounding the study). HREC (Medical) contact details: Prof P Cleaton Jones, Tel 011 717 2301, email peter.cleaton-jones1@wits.ac.za or Ms Z Ndlovu Administrative Officer 011 717 2700/1234/1252 zanele.ndlovu@wits.ac.za. If you have questions about the research, you may also contact the Principal Researcher or the Research Supervisor.

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Annexure 1b: Consent Form for Key Informant Interview

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

I have been given the information sheet on the study entitled: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities*. I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that it is up to me whether or not I would like to participate in the interview and that there will be no negative consequences if I decide not to participate. I also understand that I do not have to answer any questions that I am uncomfortable with and that I can stop the interview at any time.

I understand that the researchers involved in this project will make every effort to ensure confidentiality and that my name will not be used in the thesis and that comments that I make will not be reported back to anybody else. I consent voluntarily to participate in the interview for this study. I have been given telephone numbers that I may call if we have any questions or concerns about the research.

Participant's signature: _____ Date: _____

Interviewer's signature: _____ Date: _____

Annexure 1c: Informed Consent for Audio-Recording

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

I have been given the information sheet on the study entitled: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities*. I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that I can decide whether or not the interview should be tape-recorded and that there will be no consequences for me if I do not want the discussion to be recorded.

I understand that information from the tapes will be transcribed and transcripts will be given a code and my name will not be mentioned. I understand that if the discussion is tape-recorded, the tape will be destroyed two years after publication of the findings.

I understand that I can ask the person interviewing me to stop tape recording, and to stop the discussion altogether, at any time.

I consent voluntarily for the researcher to record the discussion.

Participant's signature: _____ Date: _____

Interviewer's signature: _____ Date: _____

Annexure 2: Key Informant Interview Guide

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

For official use only

1.	Participant number		☐☐☐☐
2.	Health Science Faculty		**O** Wits 1 **O** SMU 2 **O** UKZN 3 **O** WSU 4
3.	Position		**O** Dean/DD/AD 1 **O** HOD 2 **O** Co-ordinator 3 **O** Staff Member at DTP 4 **O** Other (please specify) ……..…….…… 5
4.	Department		**O** Family Medicine 1 **O** Public Health 2 **O** Obstetrics and Gynaecology 3 **O** Paediatrics 4 **O** Other 5
5.	Date of interview	DD/MM/YY	☐☐☐☐☐☐

INTRODUCTION/ SETTING THE SCENE

1. Could you please tell me about your role in medical education at **[named]** University?
2. What philosophy or theory underpins the training of medical students at [name] University? Probes
    a. What are the outcomes that you hope to achieve?
    b. What are the hallmarks of the graduate at [**named]** University?
3. In your opinion what have been the main achievements in transforming medical education at [name] university (probe transformation, innovation, etc.)?
4. What have been the challenges experienced in transforming medical education at [name] university?
5. When was the last review of the under-graduate curriculum at [name] university?
    a. Who participated in the review?
    b. What were the main recommendations of the review?
    c. Did the recommendations deal with decentralised training platforms?
    d. Have these DTP recommendations been implemented?

DECENTRALISED TRAINING PLATFORMS AND MEDICAL EDUCATION

We have defined a decentralised training platform (DTP) as any learning environment such as a clinic, district hospital or non-governmental organisation used for medical (or health professional) education and training, outside a central or regional hospital.

6. Could you tell me whether your university/ department make use of decentralised training platforms?
    a. What types of DTPs do you make use of?
    b. Do you know how many (#) DTPs you make use of?
    c. Do you have a list of these DTPs? If yes, could we have a copy?
    d. What is the average distance from the medical campus to these DTPs?

e. Apart from medical students, which other categories of health professional students make use of these DTPs?
f. How long have you used these DTPs?
g. Length of time that students stay at each of the DTPs.

7. Staff resources
    a. In your University/ Department, do you have dedicated staff responsible for the management of these DTPs?
    b. How many staff members do you have?
    c. What are their levels or positions?
    d. What are the responsibilities of these individuals?
    e. Could you give is the contact details of the person who is in charge of the coordination of all the DTPs?

8. Financial resources
    a. In your University/ Department, do you have a dedicated budget or finances for DTPs?
    b. Where does the budget come from (University Council, CTG, Donor, other)?
    c. Is there ongoing financial investment in these DTPs

9. Can you tell me about the relationships between [name] University and:
    a. The relevant authorities (if relevant) e.g. government, NGO, private-for-profit sector, etc.
    b. The communities surrounding these sites?
    c. The health professionals employed by the DTP (if relevant)
    d. Other stakeholders?

10. How would you describe teaching and learning at these DTPs.
    a. Teaching and learning activities
    b. Culture of teaching and learning
    c. Views on the learning activities
    d. Adequacy of DTPs for teaching and learning
    e. Intended academic outcomes

11. In your view, what are the benefits of training medical students in a DTP?
    a. What do the medical students gain from the experience?
    b. In your opinion, what is the role in, or contribution of DTPs to, transforming medical education?

12. Could you tell me about any innovations/good practices at the different DTPs? Is there any DTP (or DTPs) that stands out, and should be documented as a case study? What are the reasons for this?

13. Could you tell me about any challenges or constraints at the different DTPs?

CONCLUSION

14. Is there anything else you would like to say about DTPs used by [name] University/ department/School?
15. If you were providing advice to the Minister of Health, what recommendations would you make on:
    a. DTPs
    b. The potential role of DTPs in transforming medical education.

Annexure 3: Checklist for Document Review

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

For official use only

1. **University**	**O** Wits 1 **O** SMU 2 **O** UKZN 3 **O** WSU 4

	GUIDING REVIEW QUESTIONS*
	Review of UG curriculum that relates to training at decentralised training platforms NOT entire medical undergraduate curriculum
	1. Does the UG curriculum make explicit linkages to the university goals? (where and how)
	2. Does the UG curriculum make explicit linkages to South Africa's human resource priorities (where and how)?
	3. Does the curriculum make explicit reference to DTPs as training platforms? (where and how?)
	4. If YES, where and how?
	5. Are the prerequisites/minimum standards for a learning environment at the decentralised training platform mentioned in the document?
	6. What are the DTP learning objectives?
	7. What are the DTP learning outcomes?
	8. Is there alignment between learning outcomes and programme activities?
	9. Are the visits to DTPs examinable?
	10. How is assessment done at the DTPs?
	11. Is the grading system at the DTP clear? (what constitutes a PASS or FAIL)
	12. Other comments on document review?

***The researcher will complement document review with key informant interviews and vice versa as part of feedback on observations**

Annexure 4: DTP Facility Checklist

COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

For official use only

2. **DTP ID**	☐☐☐	
3. **Province**	**O** Gauteng **O** North West **O** Mpumalanga **O** Eastern Cape **O** Limpopo **O** KZN **O** Other (specify) ……	1 2 3 4 5 6 7
4. **Health Science Faculty**	**O** Wits **O** SMU **O** UKZN **O** WSU	1 2 3 4
5. **Type of DTP**	**O** Health Facility **O** NGO **O** Community-based **O** Other (please specify) ……	1 2 3 4
6. **Location**	**O** Urban **O** Peri-urban **O** Rural	1 2 3

BACKGROUND INFORMATION		
☐	1. What is the name of the DTP site?	_____ _____
☐	2. What is the site address?	_____ _____ _____ _____
☐	3. What is the distance from the site to health science campus?	_____ _____
☐	4. How long has the university been using this site?	_____ _____
	5. Is there a formal relationship in place between the university and the site?	☐ No...0

		☐ Yes...1 ☐ Not sure...2
	6. Are there designated preceptors appointed to receive the students?	☐ No...0 ☐ Yes...1 ☐ Not sure...2
	7. If YES, who is the employer?	☐ University...1 ☐ Department of Health ...2 ☐ Other...3 ☐ Not sure...04
	13. Are there designated preceptors appointed to supervise the students?	☐ No...0 ☐ Yes...1 ☐ Not sure...2
	14. If YES, who is the employer of these staff members who supervise the students appointed?	☐ University...1 ☐ Department of Health ...2 ☐ Other...3 ☐ Not sure...4

	SECTION 1: FACILITIES AND INFRASTRUCTURE **Please rate the following on a scale of 1 (worst) to-10 (best)**		
For official use only	Cleanliness of the facility		**Comments**
	Safety at the facility		
	Condition of physical infrastructure (e.g. buildings)?		
	Functionality of the equipment?		
	Availability of clean potable running water		

☐	Availability of uninterrupted power supply?		
☐	Availability of ablution/ toilet facilities		
☐	Availability of communication facilities (telephone?		

SECTION 2: EDUCATIONAL SUPPORT SERVICES

Please rate the following on a scale of 1 (no/never) to-10 (yes/always)

For official use only ☐	Availability of resources for learning such as books	
☐	Availability of field supervision	
☐	Availability of direct academic supervision	
☐	Availability of remote academic supervision (e.g. via telephone)	
☐	Availability of dedicated teaching room/ space	
☐	Availability of space to study while at the facility?	
☐	Availability of Wi-Fi facilities	
☐	Availability of remote access to university e-learning facilities	
☐	Availability of remote access to university library facilities	
☐	Other educational support services (please list)	_____ _____ _____ _____ _____

SECTION 3: RESIDENTIAL AND RECREATIONAL SERVICES **Please rate the following on a scale of 1 (no/never) to-10 (yes/always)**		
☐	Availability of student accommodation	
☐	Availability of recreational activities	
☐	Interaction with the local community (e.g. interaction with the local community, attendance at local community events or gatherings	
☐	Interaction with the other students	
☐	What other residential and recreational support services are in place at the facility?	_____ _____ _____ _____ _____

What field notes/observations/impressions or additional information was gathered during this site visit? Please elaborate:

_____
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Annexure 5a: Participant Information Sheet for Preceptors

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

Introduction and background
Hello. My name is Abigail Dreyer. I am a doctoral student in the School of Public Health at the University of the Witwatersrand in Johannesburg. I am doing research on decentralised training platforms used for undergraduate medical education by the health science faculties at four universities in South Africa.

Why are we doing the study?
The aim of this research project is to collect information on decentralised training platforms used for undergraduate medical education, compare these training platforms, with the view to inform the transformation of medical education in South Africa. Your insights as a preceptor at a decentralised training platform will assist greatly with meeting the study objectives.

What are we asking you to do?
We would like you to participate in completing a self-administered questionnaire about the site and then participate in a recorded interview which will take you about 30 minutes of your time. Your participation is voluntary. This is not a test, so there is no right or wrong answer. It is your opinions and experiences that are important. My role as an interviewer is to listen and to understand your point of view, but not to pass judgment. You may refuse to answer any questions that you don't feel comfortable answering. You may also say that you don't know the answer to a question.

Did you get permission to do the study?
Permission to carry out this project was obtained from the University of the Witwatersrand Human Research Ethics Committee. We have also obtained approval from the participating universities, and from the health care authorities.

Confidentiality
The information that you give in the questionnaire will be kept confidential. None of the researchers who work in this research project are staff members of any health care authority. Only members of the research team will know who has been interviewed. All interviewees will be assigned a code and these codes will be used on the transcribed interviews. These codes will only be known to members of the research team. We undertake that all information provided by you will be used only for the purpose of the study. Everything that you say will be treated as private and confidential. This means that apart from the person who asks you the questions, no one will know how you answered. Your name will not be revealed in any written data or report resulting from the study.

The answers given by participants will be combined and analysed to look for common themes and experiences. The combined information will be written up as an article, which will constitute part of the PhD thesis.

Consent
Permission to carry out this project was obtained from the University of the Witwatersrand Human Research Ethics Committees. We will ask you to sign an informed consent form, both to participate in the study and to record the interview. If you are willing to give your consent and take part in the study, we will appreciate your participation and the information that you are willing to provide.

Benefits and risks of participation
Participation in this study is voluntary and there will be no direct benefits to anyone who completes the survey. Similarly, there will be no negative consequences for individuals who do not want to participate in the study. You will not be compensated for taking part in the study. You have the right not to answer any questions that make you feel uncomfortable or that you do not want to answer.

Recording the interview
We would like to request your permission to audiotape the interview because we cannot write down all your answers quickly enough and might miss some important things that you will say in response to some of the questions that you will be asked if we do not record them. The tapes and notes will remain confidential and your identity will not be disclosed. The only thing we are interested in is your honest responses.

The tape will be listened to by the researcher. Tapes of interviews will be transcribed and transcripts of interviews will bear the code and not the name of the interviewee. The information will then be discussed by members of the research team and organized into a report. The tapes will be kept in a locked cupboard.

Whom do I contact if I want more information?
We will be happy to answer any question you have about this study. The contact details for the HREC Chair/ Administrator for participants should you wish to escalate direct queries, concerns or complaints regarding the ethical activities surrounding the study). HREC (Medical) contact details: Prof P Cleaton Jones, Tel 011 717 2301, email peter.cleaton-jones1@wits.ac.za or Ms Z Ndlovu Administrative Officer 011 717 2700/1234/1252 zanele.ndlovu@wits.ac.za. If you have questions about the research, you may also contact the Principal Researcher or the Research Supervisor.

Principal Researcher
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Annexure 5b: Consent Form for Preceptor Interview

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

I have been given the information sheet on the study entitled: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities*. I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that it is up to me whether or not I would like to participate in the interview and that there will be no negative consequences if I decide not to participate. I also understand that I do not have to answer any questions that I am uncomfortable with and that I can stop the interview at any time.

I understand that the researchers involved in this project will make every effort to ensure confidentiality and that my name will not be used in the thesis and that comments that I make will not be reported back to anybody else. I consent voluntarily to participate in the interview for this study. I have been given telephone numbers that I may call if we have any questions or concerns about the research.

Participant's signature: _____ Date: _____

Interviewer's signature: _____ Date: _____

Annexure 5c: Informed Consent for Audio-Recording for Preceptor

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

I have been given the information sheet on the study entitled: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities*. I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that I can decide whether or not the interview should be tape-recorded and that there will be no consequences for me if I do not want the discussion to be recorded.

I understand that information from the tapes will be transcribed and transcripts will be given a code and my name will not be mentioned. I understand that if the discussion is tape-recorded, the tape will be destroyed two years after publication of the findings.

I understand that I can ask the person interviewing me to stop tape recording, and to stop the discussion altogether, at any time.

I consent voluntarily for the researcher to record the discussion.

Participant's signature: _____ Date: _____

Interviewer's signature: _____ Date: _____

Annexure 6: Mini-survey with Preceptors

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

For Official use only

Province	**O** Gauteng **O** North West **O** Mpumalanga **O** Eastern Cape **O** Limpopo **O** KZN **O** Other (specify) ……	1 2 3 4 5 6 7
Health Science Faculty	**O** Wits **O** SMU **O** UKZN **O** WSU	1 2 3 4
DTP ID		☐☐☐
Participant number		☐☐☐☐
Date of completion:	**DD/MM/YY**	☐☐☐☐☐☐
Was the questionnaire completed?	**O** No 0 **O** Yes 1	☐
Date checked:	**DD/MM/YY**	☐☐☐☐☐☐

Section A – Site Related Information

	Question	Official use
1.	Describe the site. What type of facility best describes the site? (Only mark **one block** – that is most relevant) ☐ School/ NGO or community site ... 1 ☐ Primary Health Care Facility such as a clinic, community health centre, district hospital... 2 ☐ Community structure such as traditional leader.... 3 ☐ Other... 4 Please specify…….....……	☐
2.	Where is this site located? (Mark **one block**) ☐ Rural ... 1 ☐ Urban ... 0	☐
3.	How long (in years) has the university been using this site? _____	☐
4.	Rate the investment (cash/in kind/resources) the university has made to this site? (Make you mark on the line where relevant) 0 5 10	☐

	No investment some investment fair contribution significant contribution huge investment	
5.	Who is responsible for student supervision at the site? ☐ Designated site staff member... 1 ☐ University funded staff member at the site... 2 ☐ Any site staff member we recruit ... 3 ☐ No supervision is provided at site... 4	☐
6.	Who do you liaise with regards to organisation and logistics at the site? ☐ Designated site staff member... 1 ☐ University funded staff member at the site... 2 ☐ Any site staff member we recruit ... 3 ☐ No organisation and logistics needed at site... 4	☐

Section B –Attributes that are importance for effective functioning of decentralised training platforms

Below is a list of attributes that are important for the functioning of a decentralised training platform. For each, please indicate what your value of importance on a scale of 1-10 (with 1 being Low importance) and 10 being (Very high importance). Circle the relevant block or mark with an X

		Low importance									**Very High importance**	**Office Use**
7.	Staff that understand learning in different settings	1	2	3	4	5	6	7	8	9	10	☐
8.	Staff that are interested and caring	1	2	3	4	5	6	7	8	9	10	☐
9.	Team members committed to student learning	1	2	3	4	5	6	7	8	9	10	☐
10.	Management commitment to student learning	1	2	3	4	5	6	7	8	9	10	☐
11.	Community engagement in student learning	1	2	3	4	5	6	7	8	9	10	☐

Section C – Perceptions on the role decentralised training platforms can play in transforming medical education

Listed below are statements on decentralised training platforms roles. Using the provided scale state how strongly you agree or disagree with the statement.

PLEASE ANSWER ALL QUESTIONS – DO NOT LEAVE ANY OUT.

	Statement	Strongly Disagree	Disagree	Disagree slightly	Neither agree or disagree	Agree Slightly	Agree	Strongly agree
12.	Decentralised training platforms provide alternative learning environments	1	2	3	4	5	6	7
13.	Decentralised training platforms can transform student views about community-based medical practice	1	2	3	4	5	6	7
14.	Decentralised training platforms offer spaces for inter-professional teaching and learning	1	2	3	4	5	6	7

Section D – Other Comments on decentralised training platforms

a. Please rate the level of investment of funding for the decentralised training platform:

		Very Poor	Poor	Satisfactory	Good	Very Good
15.	Institution/ University	1	2	3	4	5
16.	Facility	1	2	3	4	5
17.	Community	1	2	3	4	5
18.	Students	1	2	3	4	5
19.	External Funding sources	1	2	3	4	5

b. Please rate the capacity for the entities to support students:

		Very Poor	Poor	Satisfactory	Good	Very Good
20.	Management at Facility	1	2	3	4	5
21.	Staff at Facility	1	2	3	4	5
22.	Individuals at the Facility	1	2	3	4	5
23.	Community surrounding Facility	1	2	3	4	5

c. Please indicate to what extent the following factors benefit the experience for students using these platforms (on a scale of 1 -10, with 1= No benefit and 10 = Maximum benefit)

	Factor	No benefit					Maximum benefit				
24.	Adequate accommodation	1	2	3	4	5	6	7	8	9	10
25.	Developmental supervision	1	2	3	4	5	6	7	8	9	10
26.	Connectivity to home	1	2	3	4	5	6	7	8	9	10
27.	Connectivity to campus	1	2	3	4	5	6	7	8	9	10
28.	Social interaction with other peers	1	2	3	4	5	6	7	8	9	10
29.	Recreational facilities	1	2	3	4	5	6	7	8	9	10
30.	Access to transport	1	2	3	4	5	6	7	8	9	10
31.	Religious or Cultural exposure	1	2	3	4	5	6	7	8	9	10
32.	Safety	1	2	3	4	5	6	7	8	9	10

PERCEPTIONS OF DTPS

1. Could you tell me about the theory of teaching and learning at this decentralised training platform?
2. What advantages/strengths are there in making use of decentralised training platforms?
3. What barriers/ constraints exist at decentralised training platforms?
4. In your opinion, what opportunities do decentralised training platforms offer?
5. Do you have any recommendations on how to improve the utilisation of decentralised training platforms, in undergraduate medical education?
6. Do you have any further comments on decentralised training platforms or your experiences of using them, you wish to share?

Annexure 7a: Information Sheet for Focus Group Discussion Participants

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

Introduction and background

Hello. My name is Abigail Dreyer. I am a doctoral student in the School of Public Health at the University of the Witwatersrand. I am doing research on the decentralised training platforms used for undergraduate medical education across four universities in South Africa.

The aim of this research project is to examine decentralised training platforms at four South African universities. We have defined a decentralised training platform (DTP as any learning environment such as a clinic, district hospital or non-governmental organisation used for medical (or health professional) education and training, outside a central or regional hospital.

If you agree, you will be invited to take part in a discussion with 6-10 other medical students about your experiences of medical education in general, and about DTPs in particular. I will lead the group discussion. We will you your opinions about DTPs, the benefits and value, challenges and constraints, and any suggestions for improvement. The discussion will last about an hour.

Confidentiality

The information that you give in the discussion will be kept confidential. We will not report the information to anyone. Only members of the research team will know who has been interviewed. All focus group discussions will be assigned a code and these codes will be used on the transcribed interviews. These codes will only be known to members of the research team. We undertake that all information provided by you will be used only for the purpose of the study. Everything that you say when answering the questions will be treated as private and confidential. This means that apart from the person who asks you the questions, no one will know how you answered. Your name will not be revealed in any written data or report resulting from the study.

If you wish, you may choose another name to be used during the group discussion. If you choose to participate in the group, your identity will remain anonymous. You may refuse to answer any questions that you don't feel comfortable answering. You may say that you don't know if you don't have an answer to a question. Many of the questions are about people's opinions, so there is no right answer or a wrong answer. It is your opinions and experiences that are important.

The tapes and notes will remain confidential, and will be kept in a secure place. The researchers who lead the group discussions will ask that people taking part in group discussions not to reveal any personal information about other people in the group, either during the discussion or afterwards. However, we cannot guarantee that everyone who takes part in the discussion will treat the discussion as confidential. We strongly advise against discussing information outside the group discussion.

The answers given by participants will be combined and analysed to look for common themes and experiences. The combined information will be written up in the form of a report.

Consent

Permission to carry out this project was obtained from the University of the Witwatersrand Human Research Ethics Committees (Medical). We will ask you to sign an informed consent form, both to participate in the study, as well as to record the interview. If you are willing to give your consent and take part, I will appreciate your participation and the information that you are willing to provide.

Benefits and risks of participation
Please note that participation in this study is voluntary and there will be no direct benefits to anyone who participates in the interviews. Similarly, there will be no negative consequences for individuals who do not want to be interviewed. Also note that you will not be compensated for taking part in the study. During the interview, you have the right to decline to answer any questions that makes you feel uncomfortable, or to stop the interview at any time. However, we would really appreciate it if you do share your thoughts and feelings about the questions we will be asking you.

Recording the interview
We would like to request your permission to audiotape the discussion because we cannot write down all your answers quickly enough and might miss some important things that you will say in response to some of the questions that you will be asked if we do not record them. It is essential for you to know that the tapes and notes will remain confidential and your identity will not be disclosed. The only thing we are interested in is your honest responses.

The tape will be listened to by me and my supervisor whose offices are located in Johannesburg. Tapes of discussions will be transcribed and transcripts of interviews will bear the code and not the name of the interviewee. The information will then be discussed by members of the research team and organized into a thesis. The tapes will be kept in a locked cupboard as per national requirements. The tapes will be destroyed two years after the publication of the research findings.

Contact details
We will be happy to answer any question you have about this study. The contact details for the HREC Chair/ Administrator for participants should you have direct queries, concerns or complaints regarding the ethical activities surrounding the study). HREC (Medical) contact details: Prof P Cleaton Jones, Tel 011 717 2301, email peter.cleaton-jones1@wits.ac.za or Ms Z Ndlovu Administrative Officer 011 717 2700/1234/1252 zanele.ndlovu@wits.ac.za. If you have questions about the research, you may also contact the Principal Researcher or the Research Supervisor:

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Annexure 7b: Consent Form for Focus Group Participants

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

I have been given the information sheet on the project entitled: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities.* I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that it is up to me whether or not I would like to participate in the focus group discussion and that there will be no negative consequences if I decide not to participate. I also understand that I do not have to answer any questions that I am uncomfortable with and that I can stop the discussion at any time.

I understand that the researchers involved in this project will make every effort to ensure confidentiality and that my name will not be used in the study reports, and that comments that I make will not be reported back to anybody else. I consent voluntarily to participate in the group discussion for this study. I have been given telephone numbers that I may call if we have any questions or concerns about the research.

Participant's signature: _____ Date: _____

Facilitator's signature: _____ Date: _____

Co-Facilitator signature _____ Date: _____

Annexure 7c: Informed Consent for Audiotape-Recording of the Focus Group Discussion

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

I have been given the information sheet on the project entitled: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities.* I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that I can decide whether or not the focus group discussion should be tape-recorded and that there will be no consequences for me if I do not want the discussion to be recorded.

I understand that information from the tapes will be transcribed and transcripts will be given a code and my name will not be mentioned. I understand that if the discussion is tape-recorded, the tape will be destroyed two years after publication of the findings.

I understand that I can ask the person interviewing me to stop tape recording, and to stop the discussion altogether, at any time.

I consent voluntarily for the researcher to record the focus group discussion.

Participant's signature: _____ Date: _____

Facilitator's signature: _____ Date: _____

Co-Facilitator signature _____ Date: _____

Annexure 8: Guide for Focus Group Discussions

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

For official use only

1.	FGD number		☐☐☐☐
2.	Health Science Faculty	**O** Wits **O** SMU **O** UKZN **O** WSU	1 2 3 4
3.	Overview/ characteristics of FGD		
4.	Date of FGD	DD/MM/YY	☐☐☐☐☐☐

We have defined a decentralised training platform (DTP as any learning environment such as a clinic, district hospital or non-governmental organisation used for medical education and training, outside a central or regional hospital. In this discussion, we would like to ask you more about your experiences of DTPs.

MEANING OF MEDICAL EDUCATION

1. What are the positive aspects of being a medical student at;
    a. Named university?
    b. In South Africa?
2. What are the main challenges faced by medical students in South Africa?

EXPERIENCE OF DTPS

3. During the course of your undergraduate studies, you have been to a number of the decentralised training platforms that the university makes use of. Is that correct?
    a. How many have you been to and can you describe to me your experience at these sites?

TEACHING AND LEARNING

4. Please tell us about the teaching and learning that happen at these DTPs.
    a. What types of teaching and learning activities are you engaged in?
    b. In your opinion, how do the learning activities contribute to you becoming a competent graduate (probe skills acquired, knowledge learned)?
    c. How would you describe the culture of teaching and learning?

    d. Compared to your experience at large central or regional hospitals, what are your views on the teaching and learning activities at the DTPs
5. Evaluation
    a. Do you provide formal evaluation of your placement at DTPs?
    b. What would you say is the educational value of the DTPs?
6. In your view, what are the benefits of training medical students in a DTP?
    a. What do you gain from the experience?
    b. In your opinion, what is the role in, or contribution of DTPs to, transforming medical education?

GOOD PRACTICES

    a. From your perspective as student, could you tell us about any innovations/good practices at the different DTPs that you have been to?
    b. Is there any DTP that stands out? Why is that the case?

CHALLENGES/ CONSTRAINTS

7. Could you tell us about the challenges or constraints that you experience at the different DTPs?

RECOMMENDATIONS FOR CHANGE

8. Is there anything else you would like to say about DTPs used by [name] University/ department/School, and their contribution to your education?
9. What are your recommendations for changing the under-graduate medical curriculum, with particular focus on DTPs:
    a. At this [named] University
    b. In South Africa as a whole?

Annexure 9a: Information Sheet for Log Diary Participants

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

Introduction and background

Hello. My name is Abigail Dreyer. I am a doctoral student in the School of Public Health at the University of the Witwatersrand. I am doing research on the decentralised training platforms used for undergraduate medical education across four universities in South Africa.

The aim of this research project is to examine decentralised training platforms at four South African universities. We have defined a decentralised training platform (DTP as any learning environment such as a clinic, district hospital or non-governmental organisation used for medical (or health professional) education and training, outside a central or regional hospital.

If you agree, you will be invited to record the activities you engage in at the DTP for one week. You will be provided with the template for the log diary. You will be expected to record your activities at half hour intervals.

Confidentiality

The information that you give in the log diary will be kept confidential. We will not report the information to anyone. All log diaries will be assigned a code and these codes will be used in the analysis. These codes will only be known to members of the research team. We undertake that all information provided by you will be used only for the purpose of the study. Everything that you say when answering the questions will be treated as private and confidential. This means that apart from the person who asks you the questions, no one will know how you answered. Your name will not be revealed in any written data or report resulting from the study.

If you wish, you may choose another name to be used during the group discussion. If you choose to participate in the group, your identity will remain anonymous. You may refuse to answer any questions that you don't feel comfortable answering. You may say that you don't know if you don't have an answer to a question. Many of the questions are about people's opinions, so there is no right answer or a wrong answer. It is your opinions and experiences that are important.

The tapes and notes will remain confidential, and will be kept in a secure place. The researchers who lead the group discussions will ask that people taking part in group discussions not to reveal any personal information about other people in the group, either during the discussion or afterwards. However, we cannot guarantee that everyone who takes part in the discussion will treat the discussion as confidential. We strongly advise against discussing information outside the group discussion.

The answers given by participants will be combined and analysed to look for common themes and experiences. The combined information will be written up in the form of a report.

Consent
Permission to carry out this research was obtained from the University of the Witwatersrand Human Research Ethics Committees (Medical). We will ask you to sign an informed consent form, both to participate in the study, as well as to record the interview. If you are willing to give your consent and take part, I will appreciate your participation and the information that you are willing to provide.

Benefits and risks of participation
Please note that participation in this study is voluntary and there will be no direct benefits to anyone who participates in the interviews. Similarly, there will be no negative consequences for individuals who do not want to be interviewed. Also note that you will not be compensated for taking part in the study. During the interview, you have the right to decline to answer any questions that makes you feel uncomfortable, or to stop the interview at any time. However, we would really appreciate it if you do share your thoughts and feelings about the questions we will be asking you.

Contact details
We will be happy to answer any question you have about this study. The contact details for the HREC Chair/ Administrator for participants should you have direct queries, concerns or complaints regarding the ethical activities surrounding the study). HREC (Medical) contact details: Prof P Cleaton Jones, Tel 011 717 2301, email peter.cleaton-jones1@wits.ac.za or Ms Z Ndlovu Administrative Officer 011 717 2700/1234/1252 zanele.ndlovu@wits.ac.za. If you have questions about the research, you may also contact the Principal Researcher or the Research Supervisor:

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Annexure 9b: Consent Form for Log Diary Participants

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

I have been given the information sheet on the project entitled: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities.* I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that it is up to me whether or not I would like to participate in completing the log diary and that there will be no negative consequences if I decide not to participate. I also understand that I do not have to answer any questions that I am uncomfortable with and that I can stop the discussion at any time.

I understand that the researchers involved in this project will make every effort to ensure confidentiality and that my name will not be used in the study reports, and that comments that I make will not be reported back to anybody else. I consent voluntarily to participate in the group discussion for this study. I have been given telephone numbers that I may call if we have any questions or concerns about the research.

Participant's signature: _____ Date: _____

Annexure 10: Paper version of Log Diary

A COMPARATIVE STUDY OF DECENTRALISED TRAINING PLATFORMS IN UNDERGRADUATE MEDICAL EDUCATION AT FOUR SOUTH AFRICAN UNIVERSITIES

There are many different activities that students are engaged in while at DTPs.
Using this list of activity codes, please apply the following codes when completing the log diary

A: Clinical Time

A1= Ward rounds
A2= Seeing patients in clinic/health centre/OPD
A3= Performing medical procedure
A4= Assisting in theatre
A5= On Call
A6= Other Clinical activity

B: Teaching Time

B1= Teaching activity
B2=Attending seminar/ meeting
B3= Contact with lecturer/ staff at main campus
B4= Self-directed learning [e.g. reading, study, assignment/computer-assisted learning/discussion with fellow students]
B5= Teaching by preceptor/tutor.
B6= Teaching by other staff, e.g. doctor, nurses, community health worker, physiotherapist, etc.
B7= Study/Reading

C: Skill Time

C1= Practicing a skill

D: Community Time

D1= Mobile clinic
D2= Home visits
D3= Visiting NGO or Community Organisation
D4= School visit
D5= Attending community event
D6= Organised social activity

E: Free Time

E1= Non –educational/recreation/free/sleep time
E2= Shopping/Cleaning
E3= Travelling time (including time spent waiting)
E4= Waiting for clinical activity/teaching/skill
E5= Other [please specify]

Date: _____ Day: _____ of Week:_____

Time	**Activity Code.** A: Clinical Time B: Teaching Time C: Skill Time D: Community Time E: Free Time	**Type of activity** **A: Clinical Time** A1= Ward rounds A2= Seeing patients in clinic/health centre/OPD A3= Performing medical procedure A4= Assisting in theatre A5= On Call A6= Other Clinical activity **B: Teaching Time** B1= Teaching activity B2=Attending seminar/ meeting B3= Contact with lecturer/ staff at main campus B4= Self-directed learning [e.g. reading, study, assignment/computer-assisted learning/discussion with fellow students] B5= Teaching by preceptor/tutor. B6= Teaching by other staff, e.g. doctor, nurses, community health worker, physiotherapist, etc. B7= Study/Reading **C: Skill Time** C1= Practicing a skill **D: Community Time** D1= Mobile clinic D2= Home visits D3= Visiting NGO or Community Organisation D4= School visit D5= Attending community event D6= Organised social activity **E: Free Time** E1= Non –educational/recreation/free/sleep time E2= Shopping/Cleaning E3= Travelling time (including time spent waiting) E4= Waiting for clinical activity/teaching/skill E5= Other [please specify]	**Was this activity supervised?** • *Only for clinical activities*	**Supervised by who?** **E.g., Doctor, Nurse, Preceptor/Tutor, Community Health Worker, etc.** • *Only for clinical activities*	**Your rating of Educational value. Rate 1-3** **1= no value** **2= some value** **3= great value** • *Only for clinical/teaching/ skill/community activities*	**Code Skills acquired during this activity** **P= Procedural Skill** **A= Advocacy** **D= Decision Making** **S= Problem Solving** **C= Communication** **CA= Cultural Awareness** **T= Theoretical Skill** **N= No skill acquired**	**Your rating of Enjoyment value. Rate 1-3** **1= not enjoyed** **2= did enjoy** **3= enjoyed very much** • *Only for clinical/teaching/skill/community activities*	**Could the skills have been acquired in the classroom at main campus?**
6:00 – 7:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
7:00 – 8:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
8:00 – 9:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
9:00 – 10:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
10:00 – 11:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
11:00 – 12:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
12:00 – 13:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
13:00 – 14:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
14:00 – 15:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
15:00 – 16:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
16:00 – 17:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
17:00 – 18:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
18:00 – 19:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
19:00 – 20:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
20:00 – 21:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
21:00 – 22:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
22:00 – 23:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
23:00 – 00:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
00:00 – 01:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
01:00 – 02:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
02:00 – 03:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
03:00 – 04:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
04:00 – 05:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*
05:00 – 06:00			☐*Yes* ☐ *No*		☐*1* ☐*2* ☐*3*	☐*P* ☐*A* ☐*D* ☐*S* ☐*C* ☐*CA* ☐*T* ☐*No Skill*	☐*1* ☐*2* ☐*3*	☐*Yes* ☐ *No*

Annexure 11: HREC (MEDICAL) clearance certificate

R14/49 Ms AR Dreyer

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M170704

NAME: (Principal Investigator)	Ms AR Dreyer
DEPARTMENT:	School of Public Health Medical School
PROJECT TITLE:	A comparative study of decentralised training platforms in undergraduate medical education at four South African Universities
DATE CONSIDERED:	28/07/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Professor L Rispel
APPROVED BY:	Professor CB Penny, Co-Chairperson, HREC (Medical)
DATE OF APPROVAL:	26/09/2017

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on 3rd floor, Phillip V Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit to the Committee. I agree to submit a yearly progress report. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. in this case, the study was initially reviewed in July and will therefore be due in the month of July each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature — Date: 26/09/2017

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Annexure 12: HREC (MEDICAL) extension clearance certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R49 Ms AR Dreyer

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M240358

NAME: Ms AR Dreyer **DEGREE:** PhD
Principal and Co-Investigators

DEPARTMENT: School of Clinical Medicine
Department of Medicine
Division of Family Medicine
Medical School
University

PROJECT TITLE: *A comparative study of decentralised training platforms in undergraduate medical education at four South African universities*

DATE CONSIDERED: Ad hoc

DECISION: Aproved unconditionally

CONDITIONS: Renewal of M17/07/04 - expired on 25 September 2022

NOTE: If contact information regarding student study participants is required, please contact the Registrar's office <Nicoleen.Potgieter@wits.ac.za>

SUPERVISOR: Dr S Pilusa

APPROVED BY:

Professor P Ruff, Chairperson, HREC (Medical)

DATE OF APPROVAL: 9 April 2024 **EXPIRY DATE:** 8 April 2029

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report** in the format available at https://wits.ac.za/research/researcher-support/research-ethics/ethics-committees/. This report is due annually, for the duration of the Clearance Certificate, beginning on the first anniversary of Date of Approval above. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

Signature of Principal Investigator

10 April 2024
Date

Annexure 13: The Contributor Roles Taxonomy (CRedit)

The Contributor Roles Taxonomy (CRediT)[100] was used to outline the authors' contribution to the study.

The full explanation of the terms:

Term	Definition
Conceptualisation	Ideas; formulation or evolution of overarching research goals and aims
Methodology	Development or design of methodology; creation of models
Validation	Verification, whether as a part of the activity or separate, of the overall replication/ reproducibility of results/experiments and other research outputs
Formal analysis	Application of statistical, mathematical, computational, or other formal techniques to analyse or synthesize study data
Data curation	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse
Writing– original draft	Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation)
Writing – review and editing	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages
Visualisation	Preparation, creation and/or presentation of the published work, specifically visualisation/data presentation
Supervision	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team
Funding acquisition	Acquisition of the financial support for the project leading to this publication

Annexure 14: Turnitin Report

turnitin

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A comparative study of decentralised training platforms in undergraduate medical education at four South African universities

Abigail Ruth Dreyer
Student Number: 530939

Supervisor:
Professor Aimee Stewart
Dr Sonti Pilusa

A thesis completed by published work
Submitted to the School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Doctor of Philosophy

05 November 2024

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