

**UNIVERSITY OF KWAZULU-NATAL
COLLEGE OF HEALTH SCIENCES
SCHOOL OF HEALTH SCIENCES
DISCIPLINE OF DENTISTRY**

**An exploration of community-based training opportunities for
undergraduate dental therapy students at a tertiary institution in
KwaZulu-Natal**

**A research thesis submitted as requirement for Doctor of
Philosophy degree**

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Date of Submission: 30 November 2017

DECLARATION

I, Ilanavathie Moodley, declare that

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Signed -----

Ms I. Moodley

30 November 2017

**An exploration of community-based training opportunities for undergraduate dental
therapy students at a tertiary institution in KwaZulu-Natal**

Re: I. Moodley

A thesis submitted to the Discipline of Dentistry, School of Health Sciences, University of KwaZulu-Natal, Westville, for the degree of Doctor of Philosophy in Health Sciences.

This thesis is presented in a manuscript format. This presentation comprises of six chapters which include an Introduction, Literature Review, Development of Conceptual Framework, Methods and Materials, Manuscript Presentation and Conclusions and Recommendations.

This is to certify that the contents of this thesis are the original research work of Ms I Moodley. As the candidate's supervisor, I have approved this thesis for submission.

Supervisor

A handwritten signature in black ink, appearing to read 'S. Singh', is placed within a light gray rectangular box.

Dr S. Singh

30 November 2017

MANUSCRIPTS ARISING OUT OF THIS STUDY

A total of eight manuscripts were developed from this study as follows:

1. *Strengths and challenges of community-based clinical training as viewed by academics at the University of KwaZulu-Natal, South Africa*

Authors: Ms I. Moodley, Dr S. Singh

Submitted to Journal: African Journal of Health Professionals Education

Status of Manuscript: Accepted for publication - AJHPE954 on 03/10/2017

2. *Creating opportunities for interprofessional, community-based education for undergraduate dental therapy students within the School of Health Sciences at the University of KwaZulu-Natal, Durban, South Africa: Academics' perspectives*

Authors: Ms I. Moodley, Dr S. Singh

Submitted to Journal: African Journal of Health Professionals Education

Status of Manuscript: Accepted for publication - AJHPE974 on 14/08/2017

3. *The role of assessment in community-based education for undergraduate Health Sciences students*

Authors: Ms I. Moodley, Dr S. Singh

Submitted to Journal: Perspectives in Education

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4. *What is the capacity for dental clinics within the Department of Health to support student-centred service learning? - A case study from the eThekweni District*

Authors: Ms I. Moodley, Dr S. Singh

Submitted to Journal: International Journal of Dental Hygiene

Status of Manuscript: Under review- IDH-17-OA-2111

5. *How can non-governmental and private sectors support community-based training of dental therapy students in KwaZulu-Natal?*

Authors: Ms I. Moodley, Dr S. Singh

Submitted to Journal: African Journal of Health Professionals Journal

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6. *Community-Based Education: Experiences of Undergraduate dental students at the University of KwaZulu-Natal, South Africa*

Authors: Ms I. Moodley, Dr S. Singh

Submitted to Journal: International Journal of Dental Hygiene

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7. *Case study: An Interprofessional Community-Based Collaboration between the Disciplines of Dentistry and Physiotherapy at the University of KwaZulu-Natal, South Africa - students and staff perspectives*

Authors: Ms I. Moodley, Dr S. Singh

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8. *A Conceptual Framework for Interprofessional Community-based Training for Dental Therapy Students*

Authors: Ms I. Moodley, Dr S. Singh

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ABSTRACT

Introduction

Dental undergraduate education has received much attention in recent years with a shift from traditional dental school clinical training to community-based clinical training to develop competencies of a new dental graduate (Yip and Smales, 2000). A new dental graduate is competent if he/she can appropriately apply knowledge, clinical skills and professional attitudes in diverse work settings (Yip and Smales, 2000). In a traditional dental school hospital setting, the student gains competency through repetitive completion of clinical procedures and the patient is seen as meeting the educational needs of the student by keeping appointments for set dental procedures (Eriksen et al., 2008). While this type of education leads to mastery in technical skills, it is fragmented, rigid and incentive driven (Eriksen et al., 2008). It does not fully prepare dental professionals to meet the rigors and demands of a diverse work environment, managing multi-cultural communities with a range of oral health care needs (Yoder, 2006).

The dental therapist, a mid-level oral health care practitioner, who provides basic preventive and curative dental care, receives a similar type of training. The training includes acquisition of professional knowledge and clinical skills through intense clinical training. Clinical training occurs in a hospital-based, dental school environment. This is a secondary care setting, however, a therapist is expected to work mainly in primary care settings, in diverse communities. This poses a problem for a newly qualified therapist to adjust to a work environment different from the training facility. A strategy that can facilitate the transition from a dental school environment to a work environment is to expose dental therapy students to primary care or community-based settings while in training (Yoder, 2006).

Community-based dental education (CBE) is a pedagogical approach that allows a student to develop clinical skills in a community setting so as to contextualise undergraduate training within real world settings for the student dental therapist (Yoder, 2006). Competency is built through acquisition of clinical skills by experience and reflection, and the application of critical and creative thinking in solving clinical problems (Yip and Smales, 2000). In addition, students gain a better understanding of the social, psychological, cultural and economic factors affecting oral health (Yoder, 2006).

Traditional dental school training occurs in isolation from other health professionals, yet upon graduation, health professionals are expected to work in collaboration with each other, in a team-based approach, for integrated patient care. Interprofessional learning among other

student health professionals is well documented in the literature, however dental student participation is minimal. Thus, to foster dental graduates with skills and ethics and a sense of social responsibility, academic institutions training dental therapy students must create learning opportunities that can facilitate acquisition of these skills and values (Yoder, 2006).

The University of KwaZulu-Natal, one of two universities in South Africa, training dental therapists, in line with its mission and vision of being socially accountable, is in the process of reforming health professionals' education (University of KwaZulu-Natal, 2017b, Essack, 2014). The university calls for all disciplines training health professionals to adopt the Primary Health Care Model (PHCM) to align clinical training to the needs of the health system and for health professionals to be more responsive to the needs of communities (University of KwaZulu-Natal, 2017b, Essack, 2014). This model enforces and facilitates training of health professionals in community health centres, district and regional hospitals within the Department of Health (DoH). However, in expanding the clinical training platforms, it is important to first determine the capacity of various sites to support dental student training. It is also important to create interprofessional community-based learning opportunities and obtain the perspectives of students on integrating community-based education into the curriculum.

The purpose of this study is to explore community-based learning opportunities for undergraduate dental therapy student training, test these opportunities, and then develop a framework that can guide curriculum planning and implementation of community-based training.

Aim

The study aims to strengthen community-based undergraduate dental therapy training at a tertiary institution through an exploration of learning opportunities in the public, private and non-governmental health sectors, using a self-developed conceptual framework to guide this process.

Objectives

The objectives of the study were to determine the intended role of community-based undergraduate clinical training within the College of Health Sciences through an engagement with relevant academic leaders using semi-structured interviews, to explore opportunities for interdisciplinary community driven initiatives for dental therapy students through focus group discussions with academics from the various disciplines in the School of Health Sciences, to identify support for interdisciplinary community-based clinical training in the public health

sector through semi-structured interviews with relevant stakeholders within the KwaZulu-Natal Department of Health, to explore interdisciplinary community-based learning opportunities for dental therapy training through semi-structured interviews with key role players in the non-governmental sector in KwaZulu-Natal, to explore interdisciplinary community-based learning opportunities for dental therapy training through semi-structured interviews with relevant stakeholders in the private health sector, to explore final year dental therapy students' experiences of community-based training through self-administered questionnaires, to determine the attitudes and perspectives of undergraduate Dental Therapy and Physiotherapy students participating in an interprofessional community-based health education programme through focus group discussions and to develop a conceptual framework to guide data collection and data analysis for community based training for undergraduate dental therapy students.

Methods and Materials

An in-depth exploratory study design was used to obtain a better understanding of the research phenomenon. The study used predominately qualitative methods to achieve the objectives, however, elements of quantitative methods were also used, to a lesser extent. As there were several objectives to this study, it was conducted in three phases to facilitate the data collection process.

An explorative, descriptive study design, with mainly qualitative methods, was used to achieve the objectives in the first phase. To achieve objectives one and two, interviews and focus group discussions were used to collect the data. Four semi-structured interviews were conducted with key role players in the university, including the Dean and Academic leader of Teaching and Learning and two other senior academics, and focus group discussions with a purposively selected sample was used. The sample for the focus group included an academic from each of the eight disciplines, in the School of Health Sciences resulting in a final sample size of 12.

To achieve objective three, semi-structured interviews were conducted with the Provincial Head of Oral Health Services and clinical managers of selected clinics and hospitals within the Department of Health to identify potential sites for student training. The sites were selected on the criteria that they had three or more consulting rooms to accommodate a small group of students and provided a full range of dental services within the scope of practice of a dental therapist. The final sample size included six community health centres and twelve hospitals. A data capture sheet was used to record the resources that were available at each site. The final

sample size for the interviewees was 19, including the Provincial Manager and the 18 clinical managers from the selected sites.

To achieve objectives four and five, semi-structured interviews were conducted with stakeholders within the private and non-governmental sectors involved in organising community-based health care initiatives. To select interviewees, three contacts within the non-governmental sector, known to the researcher, helped to identify further participants through the use of the snowball sampling method. The final sample size was nine, with eight from the non-governmental sector and one from the private sector.

In the second phase, a descriptive study design, with elements of action research and qualitative methods was used to achieve objectives six and seven. The final year dental therapy students were exposed to community-based clinical training and their perspectives of the experiences were obtained using self-administered questionnaires. A total of 32 out of 36 final year students participated in the study. In addition, students from the Disciplines of Dentistry and Physiotherapy participated in an interprofessional activity, and their views on the collaboration, were also obtained using focus group discussions. Two focus groups discussion were facilitated separately for the students, the first with six dental therapy students and the second with five physiotherapy students. In addition a third focus group discussion was held with the academic and clinical staff at the community health centre, including two academics (one from each discipline, accompanying the students), three dental clinical staff and one physiotherapy clinical staff, giving a final sample size of six. This was conducted to obtain their perspectives of the student collaboration. Five patients, randomly selected, were also interviewed, for their opinion of a student intervention.

The third phase involved developing a framework for interprofessional community-based training for dental therapy students using the data collected from phase 1 and 2.

In the data analysis process, the qualitative and quantitative data were analysed separately. The interviews and focus group discussion were first transcribed verbatim and then cleaned. The transcripts were read several times to identify codes. Several codes were generated and linked together in axial coding, which were then selected and collated into large themes and sub-themes. The quantitative data obtained from the data capture sheets of the site inspections were analysed using quantitative analysis through a variety of statistical techniques. The data from each sheet was extracted and captured using Excel software. All the information was collated to form a comprehensive list of available resources. A descriptive statistical method was used to comprehend the data which was presented in the form of tables and graphs. The study was

conducted following the ethical guidelines of the university. Ethics approval (HSS/1060/015D) for the study was obtained before commencing the study.

Results

Four main themes arose from the data analysis which were aligned to objectives one to seven. These themes included: benefits of community-based training, challenges experienced, learning opportunities for community-based training and the perceived barriers to implementation.

The study findings indicated that there were several benefits. The academics participating in the study believed that CBE was beneficial to students, the institution, the health system and communities. They believed that students could improve proficiency and critical reasoning by being exposed to many patients. They could also learn to connect theory to practice. Academics in the study perceived that CBE was a means for the institution to implement its goal of high impact community engagement. Benefits to the health system included building sustainable partnerships, making health care more accessible to communities and aligning the health professionals training to the needs of the health system which could make them easily employable. They also believed that communities could benefit through improved service delivery and access to services that were not previously available.

Student participating in the study believed that being exposed to community-based training improved their clinical skills and self-confidence. The dental therapy students, participating in the study, reported that they benefitted from collaborating with the physiotherapy students. They perceived a better understanding of the role of the other professional, the value of peer learning and a team approach to patient education and care.

The results of the study showed that there were also several challenges to community-based training. These challenges were both internal and external, with the main internal challenge being an absence of a clear operational plan for implementation of CBE at discipline level and across disciplines. Other internal challenges included a lack of support from college leaders, cooperation of other academics and funding. External challenges stemmed from the training sites, such as clinical supervisors not having a clear understanding of their roles and responsibilities in student training and the lack of communication between the two institutions. The study showed that there were several opportunities for community-based training in the public, private and non-governmental sectors. Opportunities within the Department of Health included students training at nearby community health centres which could create real life learning situations where students spend a set time, on a continual basis, treating patients as

they would in a workplace. The decentralised sites offered a sustained exposure over two weeks of work experience that could allow a student the opportunity to provide more comprehensive management of a patient through a follow-up appointment system. The non-governmental and private sectors offered many learning opportunities for students through their innovative means of service delivery such as a mobile health bus, a shipping container turned into a mobile clinic and classrooms in schools converted into makeshift clinics.

In addition, there were also many interprofessional community-based learning opportunities for students such as integrating oral health into general health educational talks in school and clinic settings, joining existing community projects and being part of the rehabilitation team for stroke patients.

The results of the study noted that barriers did exist in the implementation of interprofessional community-based programmes. Academics in the study sample, cited finding a common time on timetables to implement interprofessional activities and funding to be their main barriers, while clinical managers perceived clinical space to accommodate large numbers of students as their main barrier.

In addition to the overall themes provided, the results were discussed in relation to each objective. Objective one intended to determine the role of CBE in student clinical training. The academics, participating in the interviews and focus group discussions in the study, recognised that CBE was a valuable pedagogical approach in contextualising clinical training in settings that match the health system. They perceived CBE as being beneficial at various levels; to students, the institution, the health system and communities. However, they believed that the biggest challenge was that there was no clear guidelines on how this process had be made operational and implemented at individual and across disciplines.

Objective two explored opportunities for interdisciplinary community driven initiatives for dental therapy students. Findings linked to objective two showed that academics in the focus group discussions believed that students learning in an interprofessional manner had many benefits, such as an improved understanding of the scope of practice of other professionals so that could learn to refer patients appropriately in the future to provide an integrated patient care delivery. The study further indicated that there were several interprofessional learning opportunities for dental therapy students in various settings such as schools and primary health care centres. However, barriers to collaboration as identified by the focus group participants, were a mismatch in student numbers in trying to arrange equal opportunities for all students and time-table scheduling for interprofessional activities.

The results related to objective three demonstrated that the sites within the DoH could provide conducive environments for contextual student learning. The site inspection of the 18 dental clinics within the DoH revealed that the clinics in general, provided the services within the scope of the dental therapist with the exception of three, not offering restorative procedures and one, not offering scaling and polishing. They also had the necessary consumables and equipment to provide these services. The only service lacking in some of the clinics was radiography as only 61% of the clinics had an x-ray machine. The clinical managers in the study sample believed that students could benefit from learning in a real world setting. They perceived that students could master dental procedures and participate in school health programs and mobile services. They perceived that students working in such an environment facilitated their transition into the work environment. The main problem, they perceived were that students might slow down the clinicians' work progress.

The study findings in relation to objectives four and five revealed that there were many private sector and NGO community-driven projects which could provide meaningful learning opportunities for student training. Study participants indicated that students participating in their projects could benefit by adapting to different environments and working with limited resources. They believed that students could learn to treat a patient with respect and empathy, irrespective of their social, economic and cultural background and gain a deeper understanding of societal needs that could inspire volunteerism and altruism.

The results of objective six showed that the dental therapy students participating in the study, believed that working in community settings improved their clinical skills and increased their self-confidence. They perceived a better understanding of the social determinants of health, social inequalities, and diversity in cultures. The main challenge experienced, was the language barrier that hindered effective communication with patients.

The findings of the study in relation to objective seven demonstrated students' openness and readiness to participate in interprofessional activities. The dental therapy and physiotherapy student participants of the study indicated that they derived several benefits of the collaborative learning experience such as respect for the other professional, an improved understanding of the role of the other professional and appropriate referral patterns.

The last objective was to develop a conceptual framework for community-based training for undergraduate dental therapy students. The framework was guided by combining the formal theory obtained from literature and the empirical research findings of objectives one to seven of the study. It comprised of five components; the education system, selection of sites, student engagement, graduate competencies and the health system.

The framework had a strong theoretical foundation and demonstrated the value of informed research before implementing curricula changes and new teaching pedagogies. It further demonstrated the importance of obtaining students' input in decision making processes involving curriculum development. The framework showed the potential of being transdisciplinary as it could be used by other disciplines in the School of Health Sciences and other universities in South Africa training dental therapists, to guide community-based planning and implementation. However, it was limited only to the context of interprofessional community-based clinical training without exploring learning opportunities for a common interprofessional, classroom-based, theoretical foundational component for community-based education.

Conclusion

This study showed that there were several opportunities for community-based training for undergraduate dental therapy students in the public, private and NGO sectors. By taking students out of a closed university, hospital-based training centre and placing them in community settings, clinical training is contextualised in real world settings. The study reported many benefits of community-based training that could lead to the overall professional and personal development of a dental therapy student, and were reported from both the students' and academics' perspectives. These benefits prepared them for the work environment that they would soon enter. Barriers in the implementation of interprofessional community-based programmes were also noted and this needed to be addressed for the successful implementation of community-based training.

This study also demonstrated that there was a need for a deeper engagement with theory and practice in making changes to the learning process of students and to curriculum development. The framework that was developed offered a structure for the planning and implementation of community-based training. It demonstrated the importance of student and academic engagement before adopting this pedagogical approach. It emphasised the roles and responsibilities of the education and health systems, and through this collaboration with each other, could produce relevant health professionals, including oral health care professionals, who could competently provide care to patients in diverse communities. This study also initiates exploration of further engagement for opportunities in community-based training involving multiple disciplines.

DEDICATION

I dedicate this thesis in loving memory of my late parents,
Sitham and Parvathy Moodley.

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List of Abbreviations

CBE	Community-based education
CBO	Community-based organisation
CDC	Centre of Disease Control
CHC	Council of Higher Education
FBO	Faith-based Organisation
HPCSA	Health Professional Council of South Africa
KZN	KwaZulu-Natal Province
ODTC	Oral and Dental Training Centre
PHC	Primary Health Care
PHCC	Primary Health Care Curriculum
NGO	Non-governmental organisation
SMU	Sefako Makgatho Health Sciences University
UKZN	University of KwaZulu-Natal
WHO	World Health Organisation

Definition of Terms

Community Engagement: The process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people (Centre of Disease Control, 2011).

Community-based Education: Community-based teaching is a pedagogical approach that allows a student to develop clinical skills in a community setting (Skelton et al., 2001).

Service Learning: An educational approach in which students engage in contextualised service activities aimed at addressing community needs that they have identified. These opportunities should promote student development through reflection (Hood, 2009).

Interprofessional Learning: A philosophic approach embracing life-long learning, adult learning principles between cultures and health care disciplines (Stone, 2009).

Interprofessional Education: Students from two or more different health professions learn with, from and about each other to improve collaboration and quality of care (Stone, 2009).

Interdisciplinary Team: Team of health care practitioners who synthesise and harmonise the links between disciplines to create a coordinated and coherent health delivery system (Stone, 2009).

Interprofessional Collaborative Practice: Teams of health care workers who are able to practice collaboratively in health service delivery using the strengths and skills of each team member (Stone, 2009).

Collaboration: An active engagement between people from diverse backgrounds working together to provide services or solve problems (Stone, 2009). It involves the process of communication, sharing of knowledge and skills of different health professionals and joint decision making in the provision of care (Stone, 2009).

Multidisciplinary Team: Health professionals representing different health and social care professions, working closely with one another, but may not necessarily interact, collaborate or communicate with each other (Stone, 2009).

Multiprofessional Team: A multiprofessional team may consist of a number of health professionals working parallel to each other, with each having a specified role, task and professional autonomy, consults the patient on an individual basis with his/her own treatment plan, different from the other professional in a team. (Stone, 2009).

CHAPTER 1

THE RESEARCH INTRODUCTION

1.1 Introduction

A dental therapist is an oral health care practitioner who provides basic preventive and curative dental care through limited dental procedures (Nash et al., 2012). Therapists have been introduced into health systems in almost 54 countries, mainly to treat children through school health services. (Nash et al., 2012). In South Africa, dental therapists were introduced in 1975 to improve access to oral health care for disadvantaged communities in rural and underserved areas (Hugo, 2005). Their scope of practice, both on children and adults, includes an examination of patients, scaling and polishing of teeth to prevent periodontal diseases, application of primary preventive measures such as fluoride application and fissure sealants, restorative procedures and tooth extractions (Health Professions Council of South Africa, 1993). They are located in both the public and private health sectors. The Department of Health (DoH), acknowledging the role of a dental therapist in improving oral health service delivery, has been calling for an increase in their training since 1992 (Singh, 2011a).

Providing oral health care, and in general, health care remains a huge challenge in South Africa, as it still remains in the grip of a quadruple disease burden (Department of Health, 2015). Oral diseases are among the most common conditions affecting South Africans (Van Wyk and Van Wyk, 2004, Thema and Singh, 2013). The high disease burden impacts hugely on health professionals in the public sector which is inadequately staffed (Thema and Singh, 2013) resulting in unmet health needs of many communities (Singh, 2011) more especially, in the KwaZulu-Natal province, with a population of more than 10.2 million people (Statistics South Africa, 2011).

Frenk et al. (2010) argued that one of the main reasons for failing health systems, is a mismatch of the education system and the health system, where a graduating health professional exiting the education system is not adequately prepared to meet the demands of populations upon entry into the health system (Frenk et al., 2010). Health professionals' education has been criticised for following fragmented, outdated and static curricula that produce ill-prepared graduates whose competencies did not meet the needs of patients, communities and populations (Frenk et al., 2010). This was attributed to curricula focusing mainly on developing of technical skills rather than a broader contextual understanding, with clinical training being more hospital orientated rather than primary care focused (Frenk et al., 2010).

Dental education programs have also been criticised for following didactic classroom teaching and clinical training in dental school settings where students gain technical skills of clinical procedures under supervision, with the focus of clinical training being, to gain competency by timeous completions of tasks to meet numerical requirements (Yip and Smales, 2000). However, upon graduation, dental professionals find themselves inadequately prepared to treat patients with a range of dental problems, in diverse communities (Yoder, 2006).

A strategy that can be used to enhance clinical training of dental professionals is to integrate community-based education into the curriculum (Yoder, 2006). Community-based education is a form of experiential learning that allows students to connect academic studies with community service (Yoder, 2006), promoting a deeper, longer lasting learning so students can adapt to new situations and circumstances (Ehrlich, 2005).

Academic institutions play a vital role in producing various cadres of health care professionals to meet the needs of its population, however, Frenk et al. (2010), called for a definite imperative to reform health professionals' education. They called for all health professionals to be educated using competency-based approaches to mobilise knowledge and engage in critical reasoning, and ethical conduct in collaborative, interprofessional teams to be competent to function in population-centred health systems and be more responsive to local needs (Frenk et al., 2010).

Interprofessional Education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care to patients and communities by providing promotive, preventive, curative and rehabilitative care (Stone, 2009, World Health Organisation, 1988). It is an important pedagogical approach for preparing health professionals from different professional backgrounds to begin to work together in a collaborative manner to provide patient care (Buring et al., 2009). Collaboration is an active engagement between people from diverse backgrounds working together to provide services or solve problems (Stone, 2009). It involves the process of communication, sharing of knowledge and skills of different health professionals and joint decision making in the provision of care (Stone, 2009). Multiprofessional education, in contrast, is when two or more health professionals learn side by side and not necessarily learn from each other (Stone, 2009). A multiprofessional team may consist of a number of health professionals working parallel to each other, with each having a specified role, task and professional autonomy, consults the patient on an individual basis with his/her own treatment plan, different from the other professional in a team (Stone, 2009). A Multidisciplinary team indicates that people representing different health professionals involved in a given activity (Stone, 2009). Although they may work together, they do not

interact, collaborate or communicate with each other (Stone, 2009). Addressing health issues of communities requires a team of different health professionals working together, collaborating and communicating with each to find solutions for common health problems and delivering services using an integrated approach (Frenk et al., 2010). Therefore, an interprofessional collaborative approach is more appropriate to solve community health problems.

The University of KwaZulu-Natal trains a range of health care professionals including Medical Doctors, Audiologists, Biokineticists, Dental Therapists, Occupational Therapists, Pharmacists, Physiotherapists and Speech-Language Pathologists. In line with its vision and mission to be more socially accountable and its goal of providing high impact community engagement, the university has initiated steps to reform health professional education (University of KwaZulu-Natal, 2017b, Essack, 2014). It has embarked on a strategic plan to adopt a Primary Health Care Curriculum (PHCC) to address both service delivery and health professional training (University of KwaZulu-Natal, 2017b, Essack, 2014). In order to implement this, a framework of core competencies for graduating health professionals was developed with seven main roles and competencies that a graduating health professional student, including dental therapy graduates from the Discipline of Dentistry, need to satisfy. The main role should be to function effectively as entry-level health care practitioners, integrating all graduate attributes to provide optimal, ethical, comprehensive and patient-centred care in a plurality of health and social contexts (Essack, 2014). In this way, training of health professionals become contextualised as it is in alignment with the needs of the health care system into which graduates enter, and are more responsive to the needs of the communities. Thus, to foster these skills and attributes, academic institutions responsible for educating health professionals must create learning opportunities for students to experience activities that can enable them to acquire these skills and values (Frenk et al., 2010).

Community-based teaching in primary care centres can create such learning opportunities for student health professionals, where they learn about community needs and care is orientated in a more community driven manner (Frenk et al., 2010). Also, health professionals, upon graduation are expected to work in health care teams, yet their training occurs independently of each other. Hence, different cadres of student health professionals must be given opportunities in which they learn and interact together or collaborate to provide promotive, preventive, curative and rehabilitative services to patients (World Health Organisation, 1988). In addition, community-based learning can offer opportunities for all student health professionals to work together in an interprofessional collaborative team approach to address

community needs. Interprofessional collaborative team approach refers to two or more different student health professionals working together for a common goal (Stone, 2009).

The benefits of CBE is well documented in the reviewed literature (Bean, 2011, Yoder, 2006). Students develop professionally and personally and have an improved understanding of the social and cultural factors that can impact on oral health and general health (Yoder, 2006). Communities benefit by having improved access to health care in underserved communities. Local communities in KZN have long since recognised the gaps in service delivery, and driven by altruistic motives, help those who are less unfortunate around them by providing varied health care services (Piotrowicz and Cianiara, 2013). Grass root community based organisations (CBOs) and faith based organisations (FBO) have taken the initiative to undertake voluntary community-based health and oral health projects in underserved and disadvantaged communities (Piotrowicz and Cianiara, 2013). Local NGOs can play an integral role in increasing coverage of health services, expanding the current health care workforce and supplementing the Department of Health services. They serve to close an identifiable gap in service provision where health services struggle to equitably reach all individuals (Robinson and White, 1997)

These NGO projects as well as community driven health care initiatives by the private sector can serve as an innovative opportunity for active student learning by providing a rich environment for community driven training of students (Karim et al., 2008). Participating in these projects improve clinical and communication skills of student health professionals as well as give them an understanding of the health needs and demands within local communities (Karim et al., 2008). It enhances social accountability by making students address priority health concerns of communities, regions and nations (Karim et al., 2008). Furthermore, these experiences can inculcate volunteerism and a sense of moral, ethical and professional responsibility in a student health professional to serve the public well by providing care to all in need and can encourage graduates to continue with this once they qualify (Karim et al., 2008).

1.2 Problem Statement

There are national imperatives to increase the training of dental therapists. Since 1992, the Committee of Dental Deans of South Africa and the Department of Health (DoH) have been calling for the increase in training of therapists from 25 to 250 per year (Singh, 2011a). This call has been reiterated more recently in 2006 by the DoH, to increase therapists' training to 600 per annum (Singh, 2011a), acknowledging the value of dental therapists in the public

health system. However, there are only two universities training therapists in South Africa, of which UKZN is one. The clinical training of dental therapy student occurs at the Oral and Dental Training Centre (ODTC), located within the King Dinizulu Hospital. The clinical space within the ODTC is very limited, with only 17 dental chairs to accommodate the 45 students, currently enrolling annually, thereby posing a challenge to provide an effective clinical training environment for students in all three years who need access to this facility. A major problem arises when student intake needs to increase to meet the national imperative which will further compromise the current clinical training platform.

The clinical environment is similar to most dental schools in which training occurs in a hospital-based setting and is focused on gaining clinical skills through repetitive dental procedures as set by the discipline (Yip and Smales, 2000). Competency is achieved through successful completion of prescribed numerical requirements.

The problem with this type of training is that it is only focused on developing technical skills in a hospital-oriented care approach without a broader understanding of its application in the context of primary care orientation (Frenk et al., 2010). There is therefore a need to contextualise clinical training of dental therapy students as the ODTC offers an ideal clinical setting, in a secondary care centre, while dental therapists are located in primary health care settings in the health system.

The Strategic Plan of the University of KwaZulu-Natal calls for all disciplines, training health professionals, to adopt the Primary Health Care Curriculum Model to align clinical training to that of the current health system which is based on the primary health care approach (University of KwaZulu-Natal, 2017b, Essack, 2014). Clinical training needs to be aligned to the vision and mission of the university and in the broader context of the needs of the health system and communities (Essack, 2014). In order to achieve this, it proposes that clinical training platforms be extended into the community-based clinics and hospitals within the Department of Health (DoH) (Essack, 2014). There is also a need to shift part of the clinical training of dental therapy students from ODTC to primary health clinics (PHCs) or community health care centres (CHCs) and decentralised hospitals which provide more authentic learning experiences to prepare graduates to meet the oral health needs of KZN population (Essack, 2014).

While the University endeavours to expand the clinical training platforms into the DoH, to drive its implementation of the Primary Health Care Curriculum (Essack, 2014), there is a lack of published data on the capacity of the public sector to support undergraduate dental training needs.

Clinical training of dental therapy students at UKZN can be significantly enhanced by integrating community-based training into the curriculum. Through real world experiences, students can develop the skills and attributes to optimally prepare them when they enter the health system. However, there is a lack of published data on dental therapy students' perspectives of community-based undergraduate training.

In addition, student health professionals training occurs independently from each other with separate clinical areas (Rafter et al., 2006), yet upon graduation they are expected to work in a multidisciplinary team. This is an unrealistic expectation, when they are not trained together or given opportunities to learn team-based skills (Rafter et al., 2006). The Institute of Medicine in 2001, called for all health care professionals to be educated to deliver patient care in interdisciplinary teams using evidence-based practice (Rafter et al., 2006) and repeated by Frenk et al. (2010). Examples of interprofessional collaboration among health professionals is noted in the reviewed literature. This includes the collaboration of occupational therapy, physiotherapy, pharmacy and social sciences' students (Rafter et al., 2006, Buring et al., 2009), however, dental students' participation is minimal (Rafter et al., 2006). There is a lack of published data on interprofessional undergraduate training involving dental students.

Moreover, there is no student and stakeholder involvement in curriculum planning or development. Academics within disciplines are expected to implement the Primary Health Care Curriculum by creating opportunities for learning in primary health clinics and community-based settings, however, there is a lack of published data on the views of academics involved in community-based training of health professionals.

1.2 Purpose of the Study

The intention of this study is to contribute to the body of knowledge on continuing dialogue to identify ways of improving undergraduate dental therapy training. This includes to expand clinical training platforms for dental therapy students by exploring opportunities for community-based training in the public, private and non-governmental sectors. Expanding the clinical training platforms will supplement the clinical training platform at the ODTC, allowing the institution to increase the training capacity of students in alignment with the national imperative.

By expanding clinical training into community settings such as primary and community health centres, decentralised district and regional hospitals, clinical training becomes contextualised within the scope of practice of a dental therapist as their location within the public health system is in primary care settings. However, in seeking to expand the clinical training sites, it is

important to first determine the capacity of the sites to support dental student training. This study will investigate the capacity of the dental clinics within the DoH to select the most appropriate sites for optimal student learning. Furthermore, in exploring community-based learning opportunities for dental therapy training, this study is not restricted to only the public sector, but will also explore learning opportunities through community-based initiatives within the private and non-governmental sectors.

By facilitating training in community settings, the Discipline of Dentistry will be promoting training in the Primary Health Care Model in line with the University's goal of high impact community engagement and deepening its contribution to the wider society (University of KwaZulu-Natal, 2017b). It is envisioned that by exposing students to these settings, it would promote the graduate competencies of being empathetic health care practitioners who provide optimal and ethical care in diverse social and cultural settings, aiding their transition into the health system. Training therefore becomes contextualised as it will be aligned to the needs of the health system in which service delivery is mainly primary care orientated (Frenk et al., 2010). In a broader context, this type of training is also aligned to meeting the oral health care needs of communities (Thorpe et al., 2006).

In response to the call that health professionals should be educated in interdisciplinary teams, (Frenk et al., 2010), this study intends to explore learning opportunities for interprofessional community-based initiatives for dental therapy students. This study will focus on an interprofessional approach, in collaboration with other disciplines within the School of Health Sciences, UKZN.

In an attempt to integrate community-based training into the current curriculum, it is important to obtain student input into curriculum planning and development. Hence, this study will determine the views of students participating in community-based training. Since there is a lack of published data on the opinions of academics regarding community-based training, this study will also explore the perspectives of academics.

In the dental school environment, acquisition of knowledge and technical skills is considered as successful dental training. This is based on using a teacher-centred approach where information is passed from expert teacher to learner (Elkind et al., 2007). In the dental school setting, the learning process is controlled by the supervisor who checks and signs off every step for the successful completion of a task. The student is exposed to one or two patients in a session. At the community settings, the focus changes to a more student-centred approach where the students acquire knowledge through on the spot decision-making, attending to many patients, and learning is facilitated by practical teachers and role models. In this way, students

take ownership of their learning through trial and error, and being able to self-reflect and self-assess, promoting life-long learning. By providing opportunities for students to learn in environments different from the dental teaching institution, the focus is on a student-centred learning approach and role-modelling.

The core competencies developed by the Health Professional council and adopted by the University of KwaZulu-Natal, intends to develop a student professionally and personally, equipping them with skills, values and attributes to work in diverse communities. The competencies consist of seven domains:

- Health care practitioner who can function effectively as entry-level health care practitioners, to provide optimal, ethical, comprehensive and patient/client-centred care in a plurality of health and social contexts.
- Communicator who can develop rapport, trust and ethical therapeutic relationships with patients/clients, families and communities from different cultural backgrounds.
- Collaborator who can participate effectively and appropriately in multicultural, inter-professional teams.
- Leader and Manager who can collaborate with other professionals, relevant organisations and the community to draw up a plan to manage the identified health priorities and to collectively promote health.
- Health advocate who can respond to individual patient/client health needs and related issues as part of holistic care.
- Scholar who can maintain and enhance professional competence through ongoing learning, both as health care professionals and as responsible citizens, locally and globally.
- Professional who can demonstrate commitment and accountability to their patients/clients, other health care professions and society through ethical practice (Health Professions Council of South Africa, 2014).

This study intends to show that community-based training could contribute to strengthening of such skills and attributes in a graduate.

Research Questions

- What opportunities exist for community driven clinical training for undergraduate dental students in the public and private health sectors and through non-governmental organisations?

- What are the opportunities and barriers for interdisciplinary community driven programs for undergraduate dental therapy training?
- How can student community driven activities be integrated using an interdisciplinary collaborative approach?

1.4 Aims and Objectives

Aim

The study aims to strengthen community-based undergraduate dental therapy training through an exploration of learning opportunities in the public, private and non-governmental health sectors using a conceptual framework.

Objectives

1. To determine the intended role of community-based clinical training within the College of Health Sciences, by engaging with relevant academic leaders through scheduled interviews.
2. To explore opportunities for interdisciplinary community driven initiatives for dental therapy students through focus group discussions with academics from the various disciplines in the School of Health Sciences.
3. To identify support for interdisciplinary community-based clinical training within the KwaZulu-Natal Department of Health through interviews with relevant stakeholders in KZN's Department of Health.
4. To explore interdisciplinary community-based learning opportunities for dental therapy training through community driven initiatives of the non-governmental sector through interviews with key role players within the non-governmental health sector.
5. To explore interdisciplinary community-based learning opportunities through community driven initiatives of the private sector through interviews with relevant stakeholders within the private sector.
6. To determine dental therapy students' experiences of community-based training through the completion of self-administered questionnaires.
7. To determine the attitudes and perspectives of undergraduate students from the Disciplines of Dentistry and Physiotherapy participating in an interprofessional intervention through focus group discussions.

8. To develop a conceptual framework to guide data collection and data analysis for community-based training for undergraduate dental therapy students.

1.5 Format of the Thesis

This thesis is presented in the manuscript format and comprises of six chapters. An overview of chapters is outlined below:

Chapter 1: Introduction

The first chapter provides a background of the health system in South Africa and highlights the challenges it experiences in meeting the needs of the population. It also emphasises the need to have appropriately trained health care professionals to meet the needs of the health system and to serve the population well. In this chapter, the problem statement and the purpose of the study is presented. The research questions were developed with the aim and objectives clearly defined to show how the study would be conducted.

Chapter 2: Literature Review

The second chapter gives an overview of the dental therapy profession. The role of the dental therapist is defined. The scope of practice both internationally and locally is provided. It focuses on the dental therapist in the South African context, and the challenges faced regarding training and practice. Attention is drawn to the training of dental therapists at UKZN, focusing on the clinical training aspect. The concepts of community-based education and interprofessional approaches are introduced with the intention of integrating them into the current curriculum by exploring opportunities in the public, private and non-governmental sectors. It ends with the philosophic approach of the study.

Chapter 3: Development of a Conceptual Framework

The third chapter describes the theoretical approach that is adopted to frame the study. The framework developed was used to inform the choices of study design, methods and data collection processes for the study. This is followed by a schematic illustration which describes how each component contributes to the development of the framework. It illustrates how the education system can create appropriate community-based learning experiences by adopting a strong theoretical underpinning and a competency based model. This can significantly contribute to producing relevant oral health care professionals with graduate competencies that can meet the oral health needs of the health system and the population of KZN.

Chapter 4: Methods and Materials

The fourth chapter describes the study design and methodology used to achieve the objectives of the study. It introduces the setting in which the study is contextualised. To systematically collect data, the study was conducted in three phases. A table illustrating the methodology approach is provided, with the sampling process, data collection process and the choice of research instruments, being described per objective in each phase. It also explains the data analysis process for the qualitative and quantitative data collected. In this chapter, concerns about the validity of the study and ethical considerations were also addressed. Finally, it explains how the results will be disseminated.

Chapter 5: Manuscript Presentation

The fifth chapter presents the manuscripts that were developed from the study. It explains how each manuscript addresses the aim and objectives of the study and gives a brief description of the results followed by the manuscript, formatted as prescribed by the journals it was sent to.

The first manuscript, *Strengths and challenges of community-based clinical training as viewed by academics at the University of KwaZulu-Natal, South Africa*, which has being accepted for publication in the *African Journal of Health Professionals Education*, was developed from the first phase to understand the role of community-based education within the College of Health Sciences. It links to objective one and two. This manuscript describes the value of community-based education as perceived by academics and reports on the strengths and challenges of community-based training.

The second manuscript, *Creating opportunities for interprofessional, community-based education for undergraduate dental therapy students within the School of Health Sciences at the University of KwaZulu-Natal, Durban, South Africa: Academics' perspectives*, also being accepted by the *African Journal of Health Professionals Education*, addresses objectives one and two in the first phase of the study. This manuscript reports that there are several opportunities for dental therapy students to participate in interprofessional activities in collaboration with other health professional students.

The third manuscript, *The role of assessment in community-based education for undergraduate Health Sciences students* was sent to *Perspectives on Education* for consideration. It also links to objectives one and two and focuses on the role of assessment in CBE. It describes the methods used by academics and how they link to the learning outcomes of CBE.

The fourth manuscript, *What is the capacity for dental clinics within the Department of Health to support student-centred service learning? - A case study from the eThekwin District*, was

sent to the *Journal of International Dental Hygiene* and addresses objective three. It reports on the capacity of dental clinics within the Department of Health to support service learning for dental therapy students

The fifth manuscript, *How can non-governmental and private sectors support community-based training of dental therapy students in KwaZulu-Natal?* was sent to the *African Journal of Health Professionals Education* for consideration. It addresses objectives four and five and reports on the support offered by the private and NGO sectors for community-based learning for dental students.

The sixth manuscript, *Community-Based Education: Experiences of Undergraduate Dental Students at the University of KwaZulu-Natal, South Africa*, was sent to the *Journal of International Dental Hygiene* for consideration. This manuscript links to objective 6 and describes the community-based learning experiences of dental therapy students at a local community-health centre, a non-governmental dental clinic and a decentralised site.

The seventh manuscript, *Case study: An Interprofessional Community-Based Collaboration between the Disciplines of Dentistry and Physiotherapy at the University of KwaZulu-Natal, South Africa - students and staff perspectives*, was sent to the *Journal of Interprofessional Care* for consideration. This manuscript is linked to objective seven and reports on the perspectives of the students, staff and patients regarding an interprofessional collaborative initiative at a local community health centre.

The eighth manuscript, *A Conceptual Framework for Interprofessional Community-based Training for Dental Therapy Students*, will be sent to the *Journal of Interprofessional Care* for consideration. This manuscript addresses objective eight and provides a structure for how community-based education can be planned and implemented for dental therapy students. It illustrates how the two systems, namely the education and health systems, can collaborate to produce appropriate health practitioners.

Chapter 6: Conclusions and Recommendations

The final chapter presents the conclusions made from studying the research phenomenon. It presents the conclusions for each objective individually, demonstrates how each objective was achieved, and explains how the research questions were answered. It also describes how the overall aim was achieved, and the support and challenges experienced in achieving this. In addition, this chapter presents the recommendations made from this study which can contribute to positive social outcomes.

In summary, chapter one introduced the research phenomenon, the problem statement and the intention of the study. It presented the research questions, the aim and objectives of the study. It ended with a description of how the thesis would be presented and gave an overview of each chapter.

The next chapter presents a literature review of international and local perspectives of the dental therapy profession, their role in the health system and a description of the challenges and debates concerning their training. It focuses on the training of dental therapy students at a local university and the role of community-based training in aligning the clinical training to the needs of the population in diverse social and cultural contexts.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter introduces key concepts, theories and philosophies relevant to the study and provides an in-depth review of current literature relating to the research topic. An overview of the dental therapy profession as well as the scope of practice both internationally and locally are given. It shows how the dental therapist is contextualised and located within the health system. A brief history of dental therapists in the health system of South Africa is given. The challenges and debates of dental therapy training and practice are highlighted. It briefly describes the approaches to training of dental therapists and how the curriculum has transformed over the years. It introduces the concept of community-based education and the benefits and challenges thereof, demonstrating how it has been accepted internationally and in the South African context. Interprofessional education is also introduced and how this has been embraced in health professionals' education. It also looks at opportunities for community-based education for dental therapy students in the public, private and non-governmental sectors.

2.2 The Dental Therapy Profession

A dental therapist is a mid-level oral health care practitioner who provides basic dental care through limited dental procedures, however these procedures are performed in the same manner as a dentist (Nash et al., 2012). Another mid-level oral health practitioner is the oral hygienist whose main focus is prevention of oral diseases and oral health education and promotion. Dental therapists were introduced mainly for the prevention and treatment of dental diseases in children and to improve access to oral health care for disadvantaged communities (Friedman and Mathu-Muju, 2014, Nash et al., 2012). The inception of dental therapy began in New Zealand in 1921, with the provision of preventive and curative care to children through the school dental services, achieving almost 97% coverage of school children (Nash et al., 2012). Other countries, noting the success of the New Zealand model, started introducing dental therapists into their health systems to improve access to oral health care to underserved communities. Currently, over 14 000 dental therapists practice in 54 countries worldwide, including developing countries such as Gambia, Mozambique and Mali, and developed countries such as Australia, New Zealand and Canada (Nash et al., 2012). In South Africa, dental therapists were introduced in 1975 to improve access to oral health care for

disadvantaged communities in rural and underserved areas (Hugo, 2005). They were employed in the public sector under the supervision of a dentist.

Since the inception of dental therapists, many have questioned the quality of care provided by them, however, several studies carried out over the past 60 years showed that the quality of care provided by dental therapists are comparable to that of dentists and in some studies are of higher quality (Nash et al., 2012). Nash et al., in their comprehensive review of dental therapists in 54 countries concluded that therapists provide *'effective, quality and safe dental care in an economical manner'* (Nash et al., 2012). Studies on countries employing therapists in school health programs showed that the enrolment of school children in these programs range from 60-95% across countries, indicating that children are benefitting from programs solely run by dental therapists (Nash et al., 2012). This provides evidence that the role of therapists is pivotal in improving access to oral health care, however, their scope of practice across countries differ.

2.2.1 General Scope of Practice of Dental Therapists

A general scope of practice includes clinical examination, diagnosis of a dental problem and treatment planning; exposing and interpretation of dental radiographs; oral health education; preventive care including prophylaxis, fluoride therapy and fissure sealants; placements of direct restorations using amalgam and composite materials on primary and permanent teeth; stainless steel crowns; pulpotomies and the extraction of primary teeth (Nash et al., 2012). While in most countries, dental therapists are restricted to working on children only, some allow dental therapists to work on adults in both the public and private sectors. Therapists are located in varied settings such as school-based clinics, community-based clinics, hospital clinics, mobile dental units and in independent private practice, however, the school-based setting is the most common one (Nash et al., 2012). Countries that employ dental therapists for school services include Australia, New Zealand, Hong Kong, Singapore, Malaysia and Seychelles (Nash et al., 2012).

While dental therapists have many restrictions on their practice, oral hygienists are allowed to work on children and adults, in both the public and private sectors, providing preventive care through procedures such as scaling and polishing, root-planing, fissure sealants and fluoride treatment, and working in specialist practices like the orthodontist and periodontists.

2.2.2 Scope of Practice of Dental Therapists in South Africa

The scope of practice of a dental therapist in SA is the widest compared to other countries and unlike in most other countries, they can treat both children and adults, providing the following dental procedures:

- the examination of patients and the charting of their dental status,
- the scaling and polishing of teeth to prevent periodontal diseases and to treat reversible tissue change, where the only treatment necessary to reverse such tissue change is scaling and polishing,
- the application of primary preventive measures such as fluoride application and fissure sealants,
- direct restorations procedures using composite and amalgam dental materials,
- removal of teeth, both primary and permanent, under local anaesthesia, excluding impacted wisdoms.
- treatment of post-extraction bleeding and the local treatment of alveolar osteitis, including the placement of sutures,
- the treatment of minor traumatic injuries of the teeth and surrounding tissues,
- the taking of intra and extra-oral radiographs for the purpose of performing such acts that pertain to the profession of dental therapy (Health Professions Council of South Africa, 1993).

Reviewed literature provided vast evidence to show how dental therapists in over 50 countries had significantly contributed to improving access to oral health care (Nash et al., 2012), however, in South Africa, given the extensive scope of practice, oral health disparities still persist (Singh, 2011a). It could be argued that the main reason for this is that the South African health system was not fully supportive of dental therapists in creating jobs for them, as compared to other countries, in which health systems implemented the school health services that readily employed therapists.

2.3 The Location of Dental Therapists in the Health System of South Africa

South Africa has both a public and private health system under stewardship of the government, however, great differences exist between the two systems. The private system, uses almost 60% of the state health budget and serves only 20% of the population, specifically those with some sort of health insurance, while the public sector uses only 40% of the state budget, and serves

80% of the population, mainly the uninsured and poor, with a limited workforce (Gray et al., 2005).

South Africa stills grapples with a quadruple burden of disease, with communicable, non-communicable, maternal death and malnutrition remaining widespread (Coovadia et al., 2009). Oral diseases, although highly preventable, still remain a major public health problem affecting South Africans due to its high prevalence, severity and the low priority it receives (Singh, 2011). Dental caries among six years are increasing (40%) of which 80% remains untreated (Van Wyk and Van Wyk, 2004). Periodontal disease still affects more than 90% of the population, with edentulousness, malocclusions and dental trauma highly prevalent (Van Wyk and Van Wyk, 2004).

This disease profile places a huge burden on the health system. Dental services are provided in both the private and public health sectors by oral hygienists, dental therapists, dentists and dental specialists. Given the oral disease profile of South Africa, the dental therapist is well positioned and skilled in meeting oral health needs, in both the private and public health sectors, urban and rural areas (Singh, 2016). This statement is made on the premise that the treatment required, is often within the scope of practice of a dental therapist, making this cadre of oral health professionals an important member of the oral health team within the health system. In the private sector, dental therapists are located in private practices working for dentists or having independent practices.

Health systems require adequate number of oral health professionals to meet the demands of its population, however, there is a serious shortage of dental human resources (Bhayat and Chikte, 2017, Thema and Singh, 2013). Thema and Singh observed an unfavourable dental personnel to population ratio, 1:18 000 compared to 1:1 600 in other countries such as Australia, United Kingdom and United States of America (Thema and Singh, 2013). There is an uneven distribution of oral health professionals between urban and rural areas, with most of them being located in the private sector in urban areas (Thema and Singh, 2013). Bayat and Chikte, (2017) noted that 14% of the dentist population and 9% of dental specialists are located in KZN, of which almost 80% are in the private sector (Bhayat and Chikte, 2017). Similarly, 47% of dental therapists are located in the private sector (Singh, 2011b). Patients seeking dental care through the private sector usually pay through medical aid schemes or make out-of-pocket payments, thus making oral health services unaffordable to the majority of the population (Singh, 2011b) who have to rely on the public system.

2.3.1 The Public Health System

The public system has its foundation in social justice where it strives towards having a fair and just health care system that attends to the basic health needs of all members of society, especially the least advantaged (Powers and Faden, 2006). The current public health care provision is an integrated health care services based on the decentralised, district-based health system with a Primary Health Care approach (PHC). The PHC approach, makes health more accessible and affordable to disadvantaged communities through provision of essential health care service delivery that is practical, scientifically sound and acceptable and which can be sustainable by continuous participation of communities (World Health Organisation, 1978). The PHC approach is underpinned with the principles of equity, prevention, appropriate technology and community participation. The types of care offered are promotion, prevention, curative treatment, rehabilitation and palliative/supportive care.

First line treatment include maternal and child health care together with family planning, immunisation against infectious diseases and dispensing medication for chronic illnesses is offered to patients by community health nurses at primary and community health care centres with referral pattern to district hospitals for patients requiring advanced care by medical practitioners.

2.3.2 Oral Health Care in the Public Health System

In keeping with the PHC approach, a basic oral health care package offered in the public sector, at a first level care at community health centres, includes a dental examination and charting, bitewing and periapical radiographs, relief of pain and sepsis (including extractions), scaling and polishing, oral hygiene instructions and education and the placement of simple restorations (amalgam and composite-1-3 surfaces). Given their scope of practice, the dental therapist is well suited to provide the required care to address the oral health needs of KZN, within the public sector. Thus dental therapists employed in the public sector are located mainly in community health centres. Some are located in regional and district hospitals which also service surrounding CHCs. Given the oral disease profile, it would be expected that most dental therapists be employed in the public sector, contributing to improving the oral health of its communities, however, this is not so, as only 10% of dental therapists are found in the public sector in KZN (Singh, 2011b). This is in stark contrast to which the dental therapist profession was created for. The reason being, the public oral health system is faced with many challenges. Studies conducted in South Africa, highlighted by Singh (2011), showed that these challenges included inadequate number of dental facilities in the public sector which are inequitably

distributed between urban and rural areas (Singh, 2011b). Rural clinics are poorly resourced and understaffed (Singh, 2011b). Oral health receives low priority in the light of more serious health issues such as HIV and Tuberculosis (Thorpe et al., 2006). These factors collectively contribute to the lack of posts for therapists within the public sector.

2.4 History of the Dental Therapist in South Africa

The need for basic oral health care that was accessible to the majority of the population in South Africa motivated key stakeholders such as the Department of Health (DoH), the South African Dental Association and the Committee of Dental Deans to introduce dental therapists into the health system (Singh, 2011b). Dental therapists joined the public health system in 1977 as auxiliaries to the dental workforce to provide oral health care to communities in the rural and underserved areas, thereby redressing the inequalities that prevailed during apartheid (Singh, 2011a, Nash et al., 2012). They provided basic dental clinical procedures under supervision of the dentist.

As the number of qualified therapists increased, the number of placements for them within the public health sector decreased (Hugo, 2005). Posts became increasingly difficult for the therapists with the compulsory community service for dentists being implemented, which was given preference to, over the employment of therapists as noted by Pick et al. in Singh 2011. (Singh, 2011a). The failure to secure jobs, lack of recognition and promotion opportunities, resulted in many therapists feeling frustrated. Consequently, many left the profession to study again to become dentists, whilst others sought employment in other countries. This resulted in an attrition rate of 61% in 1992 (Singh, 2011a). Noting the dissatisfaction among therapists, the Health Professionals Council, in 1992, passed a piece of legislation to allow dental therapists to work in the private sector with the following conditions:

- S/he may not practice independently unless s/he has practiced for at least one year under the control and supervision of a dentist or another dental therapist approved by the Council for the purpose of these regulations,
- S/he shall refer to a dentist for treatment of all cases of pulpal exposure, excluding the emergency treatment thereof; impacted teeth; and oral diseases and dental abnormalities, such as tumours; mucosal diseases; developmental defects and infections, requiring systemic treatment.
- S/he may remove the roots of teeth only by means of hand instruments, without any incision into the soft tissues.

- S/he shall not construct or repair dentures or other dental appliances involving the taking of impressions (Health Professions Council of South Africa, 1993).

With this legislation, many therapists moved away from rural areas to work in urban areas, seeking employment in the private sector which offered better salaries, thus weakening the original intention of providing dental services, where it is most required.

2.4.1 Profile of the South African Dental Therapist

The introduction of dental therapists in SA was to basically serve the African and Coloured populations (Nash et al., 2012) with the first graduates, all 25 of them, being African. Training occurred at the two historically labelled ‘black universities’, the Medical University of Southern Africa (MEDUNSA) now called Sefako Makgatho Health Sciences University (SMU) and the University of Durban-Westville, now UKZN, which predominately trained Indians (Nash et al., 2012, Singh, 2011a). These universities were established under the apartheid rule, ‘Extension of University Education Act of 1959’, which provided separate universities for different race groups (Singh, 2011a).

Given this context, the number of dental therapists registered with the HPCSA, to date, remains low, 450 compared to 6 125 dentists (Nash et al., 2012, Bhayat and Chikte, 2017). This low number is an indication of the number of students registering for and graduating with this degree. Over the years, there has been a declining number of students applying and registering for the degree at MEDUNSA (Lalloo, 2007). A study by Singh, (2011), noted that the profile of dental therapists graduating at UKZN were very low before 1993 which was about four per year, however, the numbers have increased since then (Singh, 2011a) to around 35 currently. There was a steady increase of African graduates (42%), after 1991, however, the majority of graduates were Indians with Coloureds and Whites making up a total of 4% of graduates until 2010 (Singh, 2011b). The gender graduate profile of the profession is predominately females which is similar to other countries (Singh, 2011b, Nash et al., 2012).

To date, the attrition rate in the dental therapy profession is still high because of a lack of a clear upward career pathway for personal growth with inadequate clinical and academic development (Nash et al., 2012). This was further supported by Gordon (2013), who reported that the lack of respect and recognition for the profession, being treated unfairly, poor salaries, obtaining lower income than other professionals for the same work done, contributes to dental therapists having a very low job satisfaction (Gordon, 2013) compared to dental therapists in other countries. Despite these challenges, Gordon further reported that dental therapists’

fundamental concerns were that of making a difference to patients and communities, and not simply performing a service (Gordon, 2013).

2.4.2 Challenges and debates of Dental Therapy Training and Practice

In the South African context, a dichotomy exists in the perceptions of dental therapists between the Department of Health (DoH) and the dentists. While the DoH, recognising the potential value of dental therapists in improving the oral health status of the population, called for the increase in the number of therapists to be trained, dentists believed that their training should be discontinued and raised concerns about the quality of care provided by therapists in private practice (Hugo, 2005). This opposition began only when therapists were allowed to work in private practice, as dentists deemed therapists to be a threat to their professional existence (Singh, 2011a). The South African Dental Association declared that therapists in private practice publically claim to be equivalent to dentists, undercut prices for expensive procedures and perform procedures beyond their scope of practice such as dentures, crowns and bridges, and should be eliminated as a profession instead of extending their scope of treatment (Nash et al., 2012). The South African Health Professionals Council, further found evidence to this effect, but blamed unprincipled dentists, to an extent, who employed therapists and instructed them to perform procedures that were not within their scope of practice (Nash et al., 2012).

Similar opposition was received from dentists in the United States of America who were opposed to even having therapists as part of the dental workforce. They perceived that therapists could endanger the health and safety of the public by providing an inferior quality or second class service to patients and saw this as a way of allowing unqualified people to practice dentistry (Edelstein, 2011, Nash et al., 2012). They questioned the public acceptance of dental therapists given that therapists are *'less educated and trained than dentists'* (Edelstein, 2011). However, in New Zealand and Australia, dentists' views were different. Satur (2008), asserted that in Australia, dental therapists were being more accepted by dentists who employed them in private practice, after the law restricting them to school health services had been rescinded (Satur et al., 2008).

However, proponents of dental therapists argued that these claims were unfounded as dentists saw therapists as a threat to their own economic interests (Nash et al., 2012). Proponents, mainly consumer groups and organisations committed to social justice and public health, advocating for the underserved public, asserted that dental therapists could provide cost-effective treatment and made dental services more readily available and accessible to those who could not afford going to dentists (Edelstein, 2011). They argued that therapists could

provide safe and effective dental care as dentists, given the same circumstances, and fill the existing gaps in dental service delivery systems (Nash et al., 2012). Proponents further explained that dental therapists in the private sectors could relieve the dentists of basic dental procedures to allow more time to concentrate on more complex and technically demanding work (Edelstein, 2011).

The public opinion, however, settled this dichotomy, as the high levels of usage of school dental services by children provided evidence that the care by therapists was of a standard which was widely accepted by parents and the public at large (Nash et al., 2012). In Australia and New Zealand, most of the dental care for children is still being provided only by dental therapists (Satur et al., 2008). Since therapists have been allowed to work in the private sector in Australia, Satur (2008) noted that they were making valuable contributions to service delivery in the private sector and were well accepted by the general public (Satur et al., 2008). In the United Kingdom, Ward (2006) claimed that therapists in private practice were being received favourably by patients. Patients felt that they were informed more effectively on oral health care compared to what they had previously received from dentists. Patients also commented on the effective communication skills of therapists (Ward, 2006). This dichotomy of perceptions, however, questioned the training of dental therapists.

2.5 Dental Student Training

Training is similar for all dental students including dentists, dental therapists and oral hygienists in most countries with a curriculum that consists of biomedical sciences, acquisition of professional knowledge and technical skills for dental procedures and intense clinical training (Nash et al., 2012).

2.5.1 Biomedical Approach versus Biopsychosocial Approach

The traditional curriculum for dental students' education is grounded in basic and clinical sciences that takes the form of classroom teaching and clinical training in dental school settings (Yip and Smales, 2000). Classroom teaching involves didactic, teacher-focused teaching in increments of subject matter to instil knowledge on the science of Dentistry while clinical training occurs within a hospital-based dental school. (Yip and Smales, 2000). Clinical training has its foundation in the biomedical approach which asserts that diseases are caused by biological factors and by removal of which, restores health (Jaini and Lee, 2105). In Dentistry, for example, this can be interpreted as the removal of caries through dental procedures such as restorations and tooth extractions (within the scope of practice of the dental therapist). The

main focus of this approach is on dental procedures in which the student gains competency in technical skills, through repetitive completion of clinical procedures and meeting set numerical requirements (Eriksen et al., 2008). The student is introduced to a dental school hospital setting with a specialised clinical setting and instructed by authoritarian clinical supervisors (Eriksen et al., 2008). The patient is merely viewed as supplying the educational needs in each department (Eriksen et al., 2008).

While this type of education leads to proficiency in the practice of dentistry with the knowledge and skills obtained in this setting, recognised as advanced, it is fragmented, rigid and incentive driven (Eriksen et al., 2008). It does not consider the patient's needs or understand the social, psychological, cultural and economic factors that resulted in the oral disease. It also does not fully prepare dental professionals to meet the rigors and demands of a diverse work environment, managing multi-cultural communities with a range of oral health care needs (Yoder, 2006).

In contrast, the biopsychosocial approach proposes that in addition to the biological factors that cause disease, the psychological (thoughts, emotions, and behaviours) and social (socio-economical, socio-environmental, and cultural) factors must be taken into account in the context of disease (Jaini and Lee, 2105). In Dentistry, it is important for graduating oral health professionals to have a broad biomedical and clinical knowledge and demonstrate professionalism in the ethical provision of care in the patient's best interest (Jaini and Lee, 2105), both on an individual and community level with the goal of improving the health of society. These attributes signify a competent dental practitioner.

Competency in dental education is described as the capacity to demonstrate the use of acquired knowledge, clinical skills and personal attributes to effectively manage the oral health needs of individual patients and communities in natural settings without assistance (Manakil and George, 2011). Competencies are classified into patient-care and professional competencies including diagnosis of oral diseases, treatment planning, preventive, restorative and invasive surgical procedures. In addition, these competencies must be accompanied by professionalism, effective communication and interpersonal skills, health promotion practices and social responsibility (Manakil and George, 2011). These competencies were developed by The American Institute of Medicine, initially, to ensure patient care quality and safety. The American Dental Education Association revised these competencies for graduating dentists in 2008 to include six domains of critical thinking, communication and interpersonal skills, health promotion, practice management and information and patient care (Manakil and George, 2011).

Similarly, dental associations in other countries such as United Kingdom, Australia and Canada have developed core competencies for their graduating dental personnel (Manakil and George, 2011). The Royal College of Physicians and Surgeons (Canada) in 2015, also defined a physician competency framework for graduating medical practitioners which defines the seven roles of medical expert, communicator, collaborator, leader, health advocate, scholar and professional, each with key and enabling competencies, for a graduating medical practitioner (Frank et al., 2015).

2.5.2 The Competency-based Model

Dental schools have started transforming from a traditional biomedical approach base to a competency-based model (Yip and Smales, 2000, Manakil and George, 2011) to develop competencies to be regarded as a safe beginner practitioner (Thorpe et al., 2006). Thorpe et al. assert that dental schools must first determine these competencies and then ensure that the curriculum supports them by creating opportunities for a student to achieve them and develop ways of assessing that these competencies have been achieved (Thorpe et al., 2006).

The competency-based education model can offer a foundation to develop the essential skills required for a graduating dental professional necessary in addressing the oral health needs of communities (Gruppen et al., 2012). In this model, a student gradually develops competency in stages through instructional objectives that assist him/her to move from novice (role mimicking of instructor), to beginner (mastering foundation knowledge and performance) to competent (being able to understand their decision and displaying appropriate professional values) (Yip and Smales, 2000). This model develops personal attributes such as critical thinking, creative thinking and metacognitive abilities (Manakil and George, 2011). Critical thinking is a complex mental process which involves selecting relevant information, analysing it carefully before making judgments (Cottrell, 2005). It is an important skill for both academic achievement and for dealing with various real-life problems. Creative thinking refers to the ability to look at problems and situations in new ways, being able to generate new ideas and provide original, elaborative, and appropriate solutions (Sternberg, 1999). Creative-thinking skills allow students to adapt to various learning situations. Metacognition refers to higher order thinking involving active control over the cognitive processes engaged in learning (Flavell, 1979). These attributes allow students to self-reflect, self-assess and self-regulate, promoting life-long learning (Manakil and George, 2011).

2.5.3 Dental Therapy Training in South Africa

It can be argued that based on the size of population of the South Africa and its oral health needs, it would make sense to train more dental therapists than dentists as the reviewed literature showed evidence that it is more cost-effective to train therapists in two to three years than dentists in five years (Thorpe et al., 2006). The cost of training and deploying of therapists is half that for a dentist (Thorpe et al., 2006). Moreover, two therapists can be employed instead of one dentist, contributing to improving access to oral health care (Thorpe et al., 2006), however, this is not the case in South Africa.

In 1992, the Committee of Dental Deans, Department of Health and the Dental Association proposed increasing the training of dental therapists to 250 per year to address the shortage of oral health care workers,(Singh, 2011b) however, this has not occurred. Again, in 2006, the Department of Health, recognising the dental therapist as critical in the provision of primary oral health care, called for an increase in training of dental therapists from 25 to 600 per annum and the reduction in the training of dentists from 200 to 120 per annum (Department of Health, 2006). This report also called for all universities to start training dental therapists (Department of Health, 2006). However, to date, the other universities training dentists still do not offer dental therapy training despite the urgency. Dental therapy training still occurs only at the SMU and UKZN.

2.5.3.1 Dental Therapy training at UKZN

The Discipline of Dentistry trains dental therapists and oral hygienists, however the oral hygiene programme, a two year diploma, was discontinued in 2015, to be replaced by a three year degree program. The dental therapy course, a three year degree programme is aligned to the institution's vision and mission of aspiring to scholarship of excellence and national imperatives by being one of two universities currently training therapists. The dental therapy program has being accredited by the HPCSA with a five year review cycle. It has a current student intake of 45 students per year with an average output of 35 per year, with the focus on enrolling students from low socio-economical and rural areas (Singh, 2016). Clinical training occurs at the Oral and Dental Training Centre located within the King DiniZulu Hospital. The student dental clinic comprises of 17 dental chairs, shared by both second and third year students. Students train in separate departments in Dentistry at different times of the day, for example, the third year students may have a restorative clinic in the morning followed by a two hour clinical dentistry session by second years, and thereafter a third clinic in minor oral surgery in the afternoon.

2.5.3.2 Curriculum Development

The curriculum has undergone transformation since its development thirty years ago. Factors that contributed to changes to the form and content of the curriculum included the revised scope of practice resulting in the creation of additional modules, designed according to the personal perceptions of academics (Singh, 2011b). The programme template was revised in 2013, in which all eight credit modules were reviewed and combined with other modules in line with a college wide initiative to discontinue eight credit modules, however the overall credits progression of progress within the programme remained the same (Singh et al., 2013). The Duly Performed (DP) mark was adjusted to 40%. The revised template defined the use of evidence-based clinical practice to inform teaching and learning which is driven by innovative curriculum design, pedagogical approaches and assessment underpinned by sound ethical and quality assurance principles (Singh, 2016).

The present curriculum for dental therapy (Table 1) is competency-based with teaching based on the principles of constructivism to produce a graduate who can successfully demonstrate personal, professional and ethical conduct (Singh, 2016).

Table 1: Current Curriculum of the Dental Therapy Programme

Curriculum for Bachelor of Dental Therapy (B-DTH)			
Code	Name of Module	Credits	Sem
Level 1			
ANAT105	Introduction to Anatomy and Neuroanatomy	16	1
DENT141	Oral Biology	16	1
HPHS111	General Basic Physiology	16	1
ANAT106	Anatomy of the Head, Neck and Back	8	2
BHME222	Health & Illness Behaviour	16	2
HLSC116	Community Studies	16	2
DENT142	Foundations for Clinical Practice	16	2
DENT110	Academic Skills and Clinical Practice	8	2
Choose ONE of the following isiZulu Modules:			
ZULN101	Basic isiZulu languages Studies A	16	1
ZULM105	Academic Writing	16	1
<i>ZULN101 (non-Zulu speaking students) ZULM105 (Zulu speaking students)</i>			
Total Credits For Level 1		128	
LEVEL 2			
Code	Name of Module	Credits	Sem
DENT246	Minor Oral Surgery and Clinical Pharmacology	16	1
DENT243	Basic Dental Clinical Sciences	16	1
DENT217	General Medicine & Special Patients	16	1
DENT242	Preventive Dentistry and Radiography 1	16	1
DENT244	Restorative Dentistry and Dental Materials – Preclinical	16	2

DENT241	Dental Public Health, Ethics & Practice	16	2
DENT245	Oral Pathology, Oral Medicine	16	2
DENT252	Preventive Dentistry and Radiography 2	16	2
Total credits for level 2		128	
LEVEL 3			
CODE	Name of Module		
DENT351	Minor Oral Surgery 1	16	1
DENT353	Restorative Dentistry and Dental Materials 1	16	1
DENT355	Integrated Clinical Dentistry 1	16	1
DENT357	Diagnostic & Medical Emergencies 1	16	1
DENT352	Minor Oral Surgery 2	16	2
DENT354	Restorative Dentistry and Dental Materials 2	16	2
DENT356	Integrated Clinical Dentistry 2	16	2
DENT358	Diagnostic & Medical Emergencies 2	16	2
Total Credits Level 3		128	
Total Credits For Bachelor Of Dental Therapy		384	

Source: UKZN College of Health Sciences Year Book, 2017 (University of KwaZulu-Natal, 2017a)

The first year comprises of foundational knowledge in the basic sciences, the second, has a strong focus on the clinical practice prevention and underlying ethical principles and the third year is based on achieving exit level outcomes. These outcomes include the demonstration of clinical, professional and ethical skills and attributes in patient care according to national regulations (Singh, 2016).

The programme is structured to allow students grounding in the fundamental modules before admission to the core modules (Singh et al., 2013). The fundamental modules include Anatomy, Physiology and Oral Biology in the first semester of year one which allow for a gradual building of a knowledge base on understanding the structures and processes of the human body before attempting to understand the biological and physiological processes of the oral cavity (Foundation for Clinical Practice, DENT 142) in the second semester of year one. In this way the programme shows horizontal articulation. The curriculum also ensures that there is coherence in the development of students' knowledge and skills base as the student progresses from year one into year two e.g. a student must successfully complete the pre-clinical skills modules (DENT 142 and HLSC 116) which form the foundation to practice in the clinical modules (DENT 242 and DENT 244 & DENT 246). This shows that there is vertical articulation of modules in the first and second year of the programme (Singh et al., 2013).

Similarly, in the second year, preclinical skills in Minor Oral Surgery and Restorative Dentistry (DENT 242 and DENT 244, respectively) provide foundation for further development in the clinical modules (DENT 351, DENT 352, DENT 353 and DENT 354) (Singh et al., 2013). However modules such as Basic Dental Sciences (DENT 243), General Medicine and Special Patients (DENT 217), and General Pathology & General Microbiology (DENT 245) also provide support and foundation knowledge for these clinical modules. Thus these modules demonstrate horizontal and vertical articulation within the programme. In the third year, the modules also demonstrate horizontal articulation through the Integrated Clinical Dentistry modules when students are expected to holistically manage a patient drawing on skills and knowledge obtained in all other modules (Singh et al., 2013).

The dental therapy programme has a strong theoretical foundation in community-based and primary health care approaches articulated in all three years (Singh et al., 2013). In the first-year of study, the two modules aimed at enhancing students' knowledge and skills in community engagement and primary health care include Health and Illness behaviour (BHME 222) in the first semester and Community Studies (HLSC 116) in the second semester. These modules equip students with a basic understanding of the primary health care orientation of the South African health care system and introduces the student to the community. Knowledge and skills relating to communication, cultural diversity, sensitivity to language and socio-economic and environmental issues are also introduced in these modules. These two modules articulate vertically with second year modules, Dental Public Health Ethics and Practice (DENT 241) and Preventive Dentistry and Radiography (DENT 242, DENT 252) which have a strong focus on primary health care, ethical and professional behaviour and include community outreach programmes and visits to schools. These modules then articulate with all third year modules when students interact with patients applying the ethical principles learnt in patient management at the training centre (Singh et al., 2013).

Elements of experiential learning are seen from the first year of training when students interact with patients (Singh et al., 2013). In the first year students are exposed to the clinical environment on a limited basis and assist senior students with clinical procedures once a week (passing of instruments, appointments, etc). From the second year, students are exposed to daily clinical sessions in preventive dentistry. Community engagement in second year includes school children being brought into the dental school clinic (ODTC) and the dental therapy students perform preventive treatment on them. Different community sites such as schools and hospital wards are also visited where students conduct oral health education and promotion programmes (Singh et al., 2013). In the third year, students are exposed to patients on a daily

basis in the restorative dentistry and minor oral surgery departments. In addition, students spend a week in clinical observation at private dental practice and students also provide appropriate dental care under supervision on the Phelophepha Train services. Hence, students are exposed to children and adults with diverse social and health needs (Singh et al., 2013). Although the programme is strong in the theoretical aspects of community-based education and primary health care, a critical practical component is missing, namely, clinical training in community settings such community health care centres and decentralised clinics and hospitals.

2.5.3.3 A Critique of current training in Dental Therapy at UKZN

The internal reviews and revising of the curriculum illustrates that the Discipline of Dentistry is constantly striving for excellence in teaching and learning in alignment with the mission and vision of the university. The programme is built on a strong theoretical foundation with community engagement being embedded in the programme, more so, from a theoretical aspect rather than a practical aspect. There are significant challenges experienced in the clinical training. Clinical training occurs at the Oral and Dental Training Centre, a dental school hospital setting. As student numbers increase, the current clinical training site with its limited resources in terms of clinical space, dental chairs and equipment would not adequately cope. Hence, there is a dire need to expand the current clinical training platforms.

Moreover, while this is an ideal clinical setting, fitted with modern dental equipment and a range of dental materials, clinical training is not contextualised for dental therapists as it represents a secondary care centre whereas they are expected to work mainly in primary health care settings upon graduation. While the curriculum is strong in achieving competencies in the ideal clinical environment, there is a need to determine whether these competencies can be achieved in the broader social and cultural context in various settings.

To achieve these competencies in the broader context, students must be exposed to community settings. Thorpe et al. (2006) argued that dental education needs to be connected to communities to determine how new graduates can best meet their needs to promote health and reduce disease (Thorpe et al., 2006). A potentially effective approach is to include community engagement into the curriculum where learning is situated in community settings to enhance clinical training in order to better prepare a dental graduate for diverse work settings (Thorpe et al., 2006). In this way, clinical training can become more contextualised if it occurs in real world settings.

This was further supported by Frenk et al., (2010), in a critique of the education system, argued that one of the main reasons for failing health systems was a mismatch between the education

and the health systems in which graduating health professionals are not adequately prepared to meet the demands of populations when entering the health system (Frenk et al., 2010). They recommended institutional reforms whereby both the education and health systems should establish joint planning mechanisms regarding disease profiles, health care needs of population and health professional requirements. Further recommendations included; educational institutions should adopt competency-based approaches to student training and use these competencies to develop a set of criteria to promote professionalism and values of social accountability in graduating health professionals; promote interprofessional education to breakdown professional silos to enhance collaborative and effective team work and expand academic training sites to include hospitals and primary health centres within the health system and nurture a culture of critical inquiry (Frenk et al., 2010). These recommendations were inspired to bring about a shift from isolated to harmonised education and health systems (Frenk et al., 2010).

2.6 Community-based Learning

Community Engagement initially defined by the Centre of Disease Control (Centre of Disease Control) is *“the process of working together with people of similar interests or situations that affect the well-being of people within a particular community to bring about behavioural and environmental change to improve the health of all the members of that community”* (CDC, 1997, p 9) in (Centre of Disease Control, 2011). This was further supported by Furco in (Yoder, 2006) who conferred that community engagement in the health domain was seen as a direct mechanism of service to society. Furco in (Yoder, 2006) further stated that community engagement can be described as an umbrella term to include volunteerism, internships, experiential education, community-based teaching, service-learning, community outreach and research.

2.6.1 Community-Based Education (CBE)

Community-based teaching is a pedagogical approach that allows a student to develop clinical skills in a community setting (Skelton et al., 2001). By expanding their professional and clinical skills into community settings, dental students have a deeper understanding of patients in varied social and cultural contexts than they would in a typical dental school environment (Skelton et al., 2001). By meeting the needs and concerns of the community, the services provided become more community driven and the learning becomes meaningful as it is contextualised.

In the existing literature, another concept directly associated with community-based teaching is service-learning. Jacoby in (Hood, 2009) describes service-learning as an educational approach in which students engage in contextualised service activities aimed at addressing community needs that they have identified. However, Jacoby in (Hood, 2009) purported that these opportunities should promote both student development and communities equally and interdependently. A key component of service-learning is reflective practice, in which reflection facilitates the connection between theory and practice and fosters critical thinking to achieve professional and personal growth (Holland, 2006). Service-learning in dentistry differs from traditional clinical education in that it takes students beyond dental school walls and allows them to interact with patients in diverse community settings, where emphasis is placed on addressing community oral health concerns and the broader determinants of health (Skelton et al., 2001). One way to improve access to oral health services is to engage dental students in service delivery at primary or community care centres while in training.

Another major problem of traditional dental education is the silo approach in which student dental professionals are trained through independent curricula, faculties and facilities as is commonly observed with all health professional students' education (Rafter et al., 2006). This contributes to isolation of health professional training and health professionals practicing in isolation after graduating (Rafter et al., 2006). However, meeting community health care needs requires health care professionals across disciplines, working together in a team with a common goal (Frenk et al., 2010).

It is impractical to expect health professionals to embrace interprofessional practice if they have not received any training in this respect. Therefore, student health professionals require education and training together in interprofessional programs (Rafter et al., 2006) to develop these specific skills that are needed for working effectively in a team. Interprofessional education refers to occasions when student health professions from two or more disciplines learn with, from and about each other to improve collaboration and enhance the practice of each discipline (Page et al., 2009). These concepts can shape the thinking, attitudes and acceptance of newly qualified health professionals in adopting an interprofessional team approach to patient management. Offering learning opportunities for all students in health sciences to work together in community engagement initiatives can achieve this.

2.6.2 Theories underpinning Community-based Learning

There are several theories to explain how students learn through CBE. The social learning theories, in educational literature, show that students learn through constructivism where there is personal construction of new knowledge (Fry et al., 2009).

2.6.2.1 Constructivist Theory

Constructivism is based on the philosophy that learning occurs by fitting new knowledge and understanding into and with existing knowledge and understanding (Fry et al., 2009). Learning is a progressive internal cognitive process where there is a continuous building and amending of structures called schemata in the mind (Fry et al., 2009). As new information, actions or experiences are assimilated and stored, the schemata changes and learning occurs by adapting pre-existing knowledge and internally constructing better understanding and interpretation of new information gained (Fry et al., 2009). Knowledge that emerges is thus created and relevant to the context that the experience happens (Ertmer and Newby, 2013).

This theory is viewed as a student-centred approach where the student is an active participant in the learning process taking on a deep approach to learning with the intention of understanding and seeking meaning of new concepts by relating them to existing ones (Fry et al., 2009). This leads to a better acquisition of foundational knowledge and theory relevant to the practice of dental therapy. This is in contrast to surface learning in the traditional didactic teaching model where learning occurs only in classroom and students memorise facts and regurgitate in tests without really understanding the meaning attached to it (Fry et al., 2009).

Constructivism helps explain how students learn, taking into account prior learning that adult students bring with them, their different cultural backgrounds and expectations as there is currently a diverse student body in the dental therapy program. Learning through constructivism leads to a deeper understanding of the basic sciences and theoretical aspects of dentistry and its application to practice. Being exposed to different learning contexts and environments, students learn through building on and adapting to new situations through reflections of knowledge created and firmly understood.

2.6.2.2 Socio-constructivist theory

This theory is an expansion of the constructivist theory and asserts that knowledge is acquired through construction by individuals through their experiences in various situations and not limited to the classroom only (Fry et al., 2009). The socio-constructivist theory emphasizes the importance of social interactions in the creation of knowledge. Students learn through

interactive learning. Interactive learning is when students engage socially in conversation and action with other students on shared projects and problems, and through this interactive engagement, new knowledge is personally constructed by building onto existing knowledge (Belanger, 2011).

The underlying assumptions of this theory are that by placing students in various community-based settings, the transition into the real world is better facilitated. Learning is viewed as a self-directed process, where knowledge is constructed rather than simply received. Students gain a broader understanding of theory as they learn to integrate theory and practice in external settings.

Service learning is underpinned by this theory as it integrates community services with instruction and reflection to provide a meaningful learning experience (Hood, 2009). Students work independently and learning is facilitated by clinical staff unlike in a clinical setting with academics controlling the learning process. In these settings, students take an active role in their learning by setting goals, monitoring and evaluating progress. This provides opportunities for self-regulation, self-assessment and reflection. Through reflection, students can build on previously experienced and constructed knowledge, gaining familiarity with dental procedures contributing to improved technical skills, self-confidence and metacognitive abilities (Hood, 2009). Students also glean a better understanding of different cultures and socio-economic factors that can impact on dental treatment (Yoder, 2006). This type of learning is also beneficial to communities as service is directed in addressing their needs, understanding different cultures and other social factors that impact on health (Yoder, 2006).

Students also learn through peer learning which is acquiring knowledge and skills by helping others, and in so doing, themselves learn (Topping, 2005). By interacting with peers, advanced students and experts in the various contexts, they develop collaborative learning processes, working as a team (Topping, 2005). This theory shows that students learn better when working together with peers as opposed to learning in a classroom. This is based on the assumption that by explaining to others, concepts are better understood (Topping, 2005). Peer learning also create opportunities for interprofessional student collaboration where members of various disciplines in health sciences learn and work together for holistic patient management.

2.6.2.3 Situated Learning Theory

Another theory, the situated learning theory described by Lave and Wenger (1990) also provides a theoretical background for CBE. This theory claims that learning is embedded within the activity, context and culture, making learning more situated and unintentional rather

than deliberate (Lave and Wenger, 1990). Thus, this theory asserts that learning should occur in a context that is as close as possible to the eventual application context, making the context 'authentic' (Lave and Wenger, 1990). Applying concepts outside the original learning environment is called transfer. The transfer of learning is central to understanding how students can develop competency (Svinicki, 2004) and is best explained through this theory. According to Marton in (Fry et al., 2009), community-based learning offers an opportunity to instil in students the deep approach to learning, instead of the surface approach, where students attempt to relate and apply concepts to existing understanding and gain better meaning from their theory. This constant changing and applying themselves in different settings, allows for reflection which is integral to development of a health professional and improves competency as well as encourages lifelong learning. The underlying assumption is that by taking students out of the ideal clinical setup in dental school environment, which they become accustomed to, they learn to adapt to different learning environments in community settings with limited resources. This prepares them for diverse work environments upon graduation. In addition, it facilitates the team approach to learning where dental students and students from various disciplines of Health Sciences can work together to educate patients and holistically manage them in community settings (World Health Organisation, 1988).

2.6.2.4 Experiential Learning Theory

The constructivist perspective that learning occurs from experiences obtained throughout our lives through education, working and interaction with others is called experiential learning (Fry et al., 2009). This theory is based on the belief that understanding is not fixed or unchangeable, but can continuously form and reform as experiences shape it (Fry et al., 2009). This process is portrayed in a cycle (Kolb's learning cycle) in which a student is first freely and fully exposed to a new experience. After the exposure, the student makes observations and is given time and space to reflect on this experience. These reflections then form and reform new ideas and the integration of these new ideas result in better understanding. These ideas and enhanced understanding can then be tested in new experiences (Kolb and Kolb, 2008). In experiential learning, it is not just engaging in an experience that is important, but the processing, the deeper thinking, understanding and reflecting that takes place which leads to improvement the next time an experience is encountered (Fry et al., 2009).

Hood (2009), asserted that CBE and service learning is best explained as being derived from the experiential learning theory, in which students are directly engaged with the learning process, instead of merely receiving information passed down by the teacher. In this way the

learning is contextualised to the setting and culture, in which students gain competency in clinical skills at community settings, through service delivery based on meeting community needs, with reflection on practice being the key component (Hood, 2009). By exposing students to various community settings, they learn through their experiences other than in their own clinical training environment and by analysing their experiences, they can reflect and improve on their clinical skills. This reflection occurs through interactive learning where students learn through observation of competent practitioners already in the real-world who can serve as role models, sharing their expertise with the students as they observe and mentor them while they perform dental procedures. Students also reflect after interacting with experienced clinicians supervising them at these sites, giving feedback to them. This continuous self-assessment and self-practice leads to self-development and life-long learning.

2.6.3 Benefits and Challenges of CBE

Evidence from the literature demonstrated the value of CBE in dental professionals' training. It is mutually beneficial for both students and communities.

2.6.3.1 Benefits to students

By integrating community-based teaching into dental curricula, students develop professionally and personally and glean a better understanding of human diversity and the dynamics of diverse communities that impact on oral health and general health (Yoder, 2006). Moreover, students realise that they have a much bigger role in society. Mofidi et al., (2003) argued that dental professionals, over and above being clinically competent, should also have knowledge of health issues pertaining to communities and develop a sense of social responsibility to address these issues (Mofidi et al., 2003). Professionalism includes a responsibility to work for societal good and this is not generally taught in dental curricula, however, Yoder (2006) argues that these insights can be gained through exposure to community-based teaching where students become aware of the challenges of communities and its impact on oral health and general health (Yoder, 2006). Skelton (2001), Eaton et al. (2006) and Piskorowski (2012) noted the following when dental students were exposed to learning in community settings:

- Attending to more patients than in dental school,
- Being exposed to patients with wide range of problems in the real world,
- Improves clinical skill and capabilities,

- Improves student self-confidence in patient management,
- Enhances student ability to adapt to different work settings,
- Increases student awareness of communities' needs and demands,
- Heightens student awareness of health disparities,
- Understanding diverse communities and cultures,
- Expanding the dental workforce,
- Improves service delivery to underserved and underprivileged communities,
- Encourages engagement in community services after graduation,
- Instils a sense of social responsibility and accountability in students,
- Enhances students' professional and personal growth (Skelton et al., 2001, Eaton et al., 2006, Piskorowski et al., 2012).

2.6.3.2 Benefits to communities

CBE programs broadly addresses the lack of access to health care and oral health care to many parts of the population including the underserved and disadvantaged communities with a range of disease complexities and prevalence (Hood, 2009). These programs have been found to be beneficial to students, but at the same time, is mutually beneficial to the community in which students work, with the following benefits being observed:

- Improved access to oral health care in disadvantaged communities due to geographic location, remote areas, areas with very limited dental personnel,
- Dental care made more affordable,
- Increased awareness and knowledge of oral health,
- Opportunities for work for graduates in the future,
- Potential to recruit dental students from local areas (Eaton et al., 2006).

The reciprocal nature of CBE is well documented in the literature. Bean considers community-based education as a “*win-win relationship in which students gain an excellent professional experience while providing much needed care to underserved communities*” (Bean, 2011). While some authors argue that the benefits for students outweighs that to the community, (Kristina et al., 2006), others believe that communities are just regarded as passive recipients of service delivery by students. Diab and Flack (2013), affirm that for maximum benefits for both parties, communities should be consulted so that learning activities could be aligned to needs of the community that are identified by them (Diab and Flack, 2013).

2.6.3.3 Challenges of CBE

While there may be several benefits derived from CBE, many challenges also exist. The integration of CBE into traditional curriculum is seen as problematic, because of attitudes of lecturers, who perpetuate traditional norms of clinical teaching, are resistant to change and find it difficult to embrace CBE. Students sometimes regard this as ‘second-best’ training compared to training at high-level, academic, urban hospitals (Doherty and Couper, 2016). Students also not receiving adequate support in terms of accommodation at rural sites, isolation from friends and family are also documented as impending challenges (Doherty and Couper, 2016).

2.6.4 Community engagement in South African Universities

The Council of Higher Education, defines community engagement as teaching, learning and research initiatives of educational institutes to address issues relevant to particular community needs with the aim of making a better environment for that community (Centre of Higher Education, 2004). The Council advocated the integration of community engagement into curricula in the South African context to bridge the gap between higher education and society and to become active partners in communities (Centre of Higher Education, 2004). The communities in the South African context refer to the disadvantaged, underserved, underserved communities in the urban, peri-urban and rural areas which can be accessed through service sectors including governmental, non-governmental, community-based and faith-based organisations (Centre of Higher Education, 2004).

Universities in South Africa, training health professionals, recognising the benefits of CBE and SL, are now integrating these educational approaches into their curricula by modifying individual modules and restructuring clinical training (Kruger et al., 2015). By adopting these approaches, students learn to apply the knowledge gained in the classroom to real-world settings which contributes to student-centred learning, with opportunities for self-reflection (Kruger et al., 2015).

2.6.5 Community-based activities at UKZN

UKZN, in its efforts to transform health professionals’ education, aims to shift from a traditionally structured basis to a more competency-based focus that adds value to the communities it serves (University of KwaZulu-Natal, 2017b, Essack, 2014). To drive this agenda, the College of Health Sciences (CHS) at UKZN has embarked on a business plan to adopt a Primary Health Care Curriculum (PHCC) to address both service delivery and health

professional training. A business plan, developed, proposes that a Primary Health Care (PHC) approach be followed for all programmes offered by the College of Health Sciences (Essack, 2014). In line with this approach, the College seeks to produce socially accountable, competent and relevant health care professionals with discipline specific technical skills and generic higher education competencies and attributes using a set of core competencies (Table 2.2) developed by the Medical and Dental Professional Boards of the Health Professions Council (2014), to make graduates become more responsive to the provincial and national health priorities, burden of disease and the health system. The graduate health professional should be an empathetic health care practitioner who can communicate with patients across cultures, collaborate with other health professional and work in a varied social contexts (Health Professions Council of South Africa, 2014).

Table 2.2: Graduate Competencies for student health professionals at UKZN

Role	Criteria
Health care practitioner	able to provide optimal, compassionate and culturally sensitive patient care using primary health care principles; adapt to working in a community setting; use critical thinking in managing complex care situations.
Communicator	able to communicate with patients from different cultural backgrounds; develop trusting and ethical relationships with patients.
Collaborator	able to participate effectively in an interdisciplinary team; recognise and respect the roles, responsibilities and competencies of other team members.
Leader and Manager	able to identify the socio-economic, demographic, cultural and environmental factors that affect the health of this community. Skills in understanding how the health system operates at different levels.
Health Advocator	able to identify the health needs of individual patients taking their culture into consideration; advocate for patients with particular health needs (including the poor and marginalised members of society)
Scholar	able to reflect on one's strengths and limitations of knowledge and skills; enhance professional skills and lifelong learning.
Professional	able to display professional behaviour, commitment, respect, empathy, altruism, beneficence and no maleficence when treating patients.

Source: Core competencies for undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa (Health Professions Council of South Africa, 2014)

These core competencies are essential for health professionals, more especially dental professionals, who should be competent, respect all patients, have integrity and always acting in their patients' best interest, and not for prestige or money (Naidoo, 2016). Professionalism in dentistry is seen as that quality of conduct and character that uses knowledge, skills and judgement to take pride in the work they do, paying attention to detail and not be happy with substandard work, acknowledge mistakes and to learn from them in order not to repeat them (Naidoo, 2016). In addition, dental professionals must demonstrate concern for the welfare of the public. Acts of social responsibility they need to display are, care, charity, public health and oral health education (Naidoo, 2016).

To train fit-for-purpose health care workers with competencies that would enable them to meet the demands of diverse communities, UKZN intends expanding its clinical training platforms into the health system for all health professionals. Through a partnership with the DoH (KwaZulu Department of Health and University of KwaZulu-Natal, 2014), UKZN can implement its decentralised clinical training program. In this program, it is envisioned that by expanding the clinical training platforms to decentralised sites (any site away from the central academic training site), student learning becomes embedded in the social context of illness and health (Essack, 2014). The decentralized clinical training platforms include regional and district hospitals, primary health clinics and community health centres. In the Business Plan (2014), it is stated that all student health care professionals be trained in the primary health care curriculum that is reflective of a holistic, interprofessional educational approach (Essack, 2014). The Medical students are currently engaged with decentralised training sites with the expectation of students from other health sciences disciplines to follow, however, in expanding the clinical training platforms, it is important to first determine the capacity of these sites to meet discipline specific needs for effective student learning.

2.7 Expanding clinical training platforms within the health system

Expanding academic training from the university classroom into the health system sites such as community health centres and district hospitals in peri-urban and rural areas, has several advantages. It contextualizes clinical training of dental therapy students, allowing them to experience real-world situations. It adopts a student-centred approach to learning where students learn through experience and reflecting on this, construct their own meaning. By treating more patients than they would in one clinical session at the dental school hospital centre, they improve their technical skills and learn more about the services provided in the communities (Mabuza et al., 2013). There is overall improvement in self-development and self-

confidence (Skelton et al., 2001). Students learn about the social, cultural and economic factors that impact on health and oral health (Mabuza et al., 2013). By working in the health system, students could complement the current workforce in under resourced areas, improving access to health care. This is further supported by Mabuza et al. (2013) in that students are viewed as important members of the health team and are appreciated and welcomed by communities.

A study by Kaye et al. showed that when students are placed in rural settings, it changes their attitudes towards rural practice and may influence them to work in underserved areas (Kaye et al., 2010). Lalloo and Massey (2013), also affirmed that clinical placements of dental students in remote rural areas helped to address unmet dental needs of these communities and it is envisioned that through this experience, graduates would want to serve some of their professional lives in these underserved communities (Lalloo and Massey, 2013).

2.7.1 Challenges of expanding clinical training to the health system

In the reviewed literature, Gordon (2013) stated that a supportive environment plays an important role in student learning and developing of clinical skills (Gordon, 2013). This raises concerns regarding a conducive learning environment within the health system such as infrastructure, availability of materials and equipment necessary to perform all dental procedures at the various sites, and adequate exposure to all types of dental procedures within the scope of practice of a dental therapist. Doherty and Couper (2016) observed that health care facilities were generally poorly resourced, supplies of materials and equipment being erratic with limited teaching resources. In addition, most dental clinics within the public health system have very limited space to accommodate students. This could pose as a huge barrier for effective student CBE programs (Doherty and Couper, 2016).

Another challenge is the supervision of students by clinical staff who may not be compliant as they may perceive this as additional work over and above their service delivery duties (Mabuza et al., 2013). Students can also be viewed as being burdensome if they slow down the work pace in busy clinics (Mabuza et al., 2013). This was further supported by Doherty and Couper (2016) who affirm that staff at clinics believe students aggravate workloads and slow down consultations and procedures. However, other studies in the Philippines have found students effective in reducing the workloads (Doherty and Couper, 2016). Although student presence may be acknowledged by the community members, there may be inconsistencies in the communities' acceptance of student treatment (Mabuza et al., 2013).

Another challenge of community-based training was the cost involved, especially if students are placed in decentralised, rural communities for varying lengths of time. Costs are incurred

in transporting and accommodating students at these sites. Lalloo argued that although rural placements are costly in terms of salary, travel and subsistence and accommodation, the benefits to the both the students and local communities outweighs the additional costs (Lalloo and Massey, 2013).

2.8 Exploring clinical training platforms within the private and non-governmental sectors

Given the high disease prevalence in KwaZulu-Natal the public health system, struggles to adequately meet the health care demands of its population of over 10 million (Department of Health, 2015). The DoH has a critical shortage of health care workers, unequally distributed between urban and rural areas (Coovadia et al., 2009), leaving many people from rural and disadvantaged communities having limited access to health care including oral health care services, indicating a definite gap in health services delivery.

Local communities in KZN, having a strong sense of social responsibility, intervened by picking up the government's deficits in social services, via the philanthropy of donors and the socially aware, through Non-Governmental Organisations (NGOs). NGOs are entities that operate not to gain any profit and do not belong to the government (Piotrowicz and Cianiara, 2013). NGOs include grass root community based organisations (CBOs) and faith based organisations (FBOs), making significant contributions across many fields such as education and research, social services, health, culture and recreation, law, development and housing, etc. (Piotrowicz and Cianiara, 2013).

In Health, NGOs supplement the public health services by increasing access to health care through service delivery, raising awareness and prevention programmes towards improving health outcomes (Piotrowicz and Cianiara, 2013). In KZN, their activities include health awareness, assessment of vital signs, examination and treatment by a medical practitioner, dispensing chronic medications to patients, vision screening, removal of cataracts, etc. Oral health services range from oral health education and promotion, dental screenings, tooth extractions for relief of pain and sepsis, restorations, scaling and polishing, specialised work such as correction of cleft palates, etc. These services are performed by health professionals, on a voluntary basis, free of charge, in underserved and underinsured communities, helping to reduce the unmet health needs of the province and relieving over-burdened public clinics.

Moreover, some private companies also provide primary health care services to the community on a humanitarian basis, with no intention of making any profit. These community driven health care projects undertaken by the private sector and NGOs can also serve as an innovative opportunity for active student learning by providing a rich environment for service delivery

activities. Karim (2008), noted an improved clinical and communication skills of student health professionals as well as a deeper understanding of the health needs and demands within local communities when health professional students participated in such projects. It also enhances social accountability by making students address priority health concerns of communities (Karim et al., 2008). Furthermore, it can inculcate volunteerism and a sense of moral, ethical and professional responsibility, in a student health professional, to serve the public well by providing care to all in need and will encourage graduates to continue with this once they qualify (Karim et al., 2008). Therefore this study aimed to explore experiential learning opportunities for dental therapy students through community driven health initiatives of the public, NGO and private sectors in KwaZulu-Natal.

2.9 Philosophic Approach of the Study

In order to conduct this study, a constructivist philosophic worldview was used to study the research phenomenon. The study phenomenon, being community-based education, was not abstract and quantifiable to use the positivist approach, but it involved individuals at different levels; students, academics, people in authority and patients, whose views could be best articulated through this approach. There were four main assumptions of the constructivist approach used in this research that linked to specific levels of the research process; ontology, epistemology, axiology and methodology.

2.9.1 Ontology

The constructivist's approach is underpinned by a relativism ontology where reality is viewed as subjective and differs from person to person. Realities are individually constructed, thus there can be multiple realities (Creswell, 2012). This is different from the positivist's ontology which is one of realism, where a researchable reality exists independently of the researcher (Crotty, 1998). This study, involved various individuals with multiple realities which were reported in the actual words of different individuals with different perspectives.

2.9.2 Epistemology

Epistemology can be described as *"how we know what we know"* (Crotty, 1998). According to the constructivist's approach, knowledge is obtained through subjective means, mainly through people's understandings on why and how things happen and their interactions with each other in a social context (Creswell, 2012). The constructivist element was used to look at the nature of knowledge construction from each individual's perspective through their

interactions with each other and their thoughts. The epistemology of constructivism differs from a positivist's approach in which realities are obtained objectively, where meaning exists in objects independent of any consciousness and it is the researcher's role to obtain this meaning (Crotty, 1998). In this study, the meaning derived was descriptive, factual and absolute and was used to create a holistic reconstruction from all participants. Thereafter, this was presented to some of the participants for clarification of their views on what they really intend to say.

2.9.3 Axiology

Axiology refers to the values that researchers bring to the study. In the constructivist's approach, values and biases are openly reported (Creswell, 2012). Charmaz (2006), claimed that because the researcher cannot replicate the experiences of the participants or be separated from the research phenomenon, the values of the researcher and participants are always present making this approach inherently biased (Charmaz, 2006). Hence, Charmaz (2006) asserted that constructivist's research needed to be reflexive. This is a process of indicating how the researcher's own assumptions and views impact on the research process and in interpreting the multiple realities (Charmaz, 2006). Constructivist's inquiry has often being criticized for using convenience sampling strategies in which participants are self-selected and that could be seen as researcher's biased assumptions (Bryman, 2001). It also draws attention to the credibility of the research. Validity refers to the degree to which the data truly represent the participants' views, attitudes and perspectives. In the positivist's approach, validity, reliability, generalisability and objectivity are criteria used to evaluate research. However, in the constructivist's inquiry, these evaluation criteria are replaced by credibility, transferability, dependability and conformability (Lincoln and Guba, 1985).

2.9.4 Methodology

Methodology refers to the strategies used by researchers to guide the selection and use of methods to collect and analyse data (Crotty, 1998). Researchers positioned within the constructivism paradigm usually use qualitative methods to conduct their research. These methods capture the subjective meanings and interpretations of individual participants to construct a holistic meaning (Rubin and Rubin, 2005). Constructivist researchers contend that qualitative research is inductive in nature, align to research being time and context bound ,with the results leading to a deeper understanding of the research phenomenon (Dieronitou, 2014). This is in contrast to the positivist's paradigm, where data collection is science-based, making

the research objective, measurable, predictable and controlled. Positivist researchers claim that quantitative research is deductive in nature, usually testing a hypothesis or theory, using experiments, remains time and context free, making the results generalizable (Dieronitou, 2014).

The reviewed literature revealed that researchers may embrace both qualitative and quantitative methods within a single research project, however, there is a tendency for the data analysis and reporting of results, to be derived from one distinct philosophical standpoint and to take a positivist or constructivist/interpretivist approach (Crotty, 1998).

In this study, a constructivist approach was maintained, using mainly qualitative methods for data collection to obtain a deeper understanding of the research phenomenon. In addition, elements of quantitative methods were used to add value to the study. The data analysis and reporting was conducted using the constructivist approach.

2.10 Summary

This literature review provided a background of the dental therapy profession, the introduction of therapists into the health system, their effectiveness and challenges in improving oral health care in the least advantaged communities. It focused on dental therapists in the South African context, their location and importance in the health system, and their struggles within the dental fraternity as well as in the health system. Attention was given to the dental therapy student training, more especially at UKZN. It provided an insight into their training, curriculum development and questioned the hospital-based, incentive-driven, biomedical approach to clinical training in achieving competencies required for a graduating dental therapist to function effectively in diverse work settings to meet the oral health needs of the province. It introduced the concept of community-based education, providing a detailed theoretical background and offered the benefits and challenges of community-based training in support for its inclusion in the current clinical training.

The review also identified several needs such as the need for integration of community-based training into the curriculum, the need to expand the clinical training platforms to contextualise training of dental therapists and attain graduate competencies in the broader social context. In expanding the clinical training platforms, it was important to determine whether these sites were conducive to learning and could meet the requirements of dental student training. It also identified the need for dental therapy students' participation in interprofessional collaboration. The next chapter presents the conceptual framework which was developed to guide the study.

CHAPTER 3

DEVELOPMENT OF A CONCEPTUAL FRAMEWORK

3.1 Introduction

This chapter describes the theoretical approaches underpinning this study. An exploration of community-based opportunities for undergraduate dental students was a complex project, the findings of which needed to be reported according to established criteria to maintain rigor in research (Creswell, 2012). To ensure this, a conceptual framework was developed to guide the choice of research design, methods, data collection and analysis processes of the study. The framework was informed by the researcher's approach or paradigm. A research approach is a philosophic worldview in an attempt to understand the research phenomenon. The approach used in this study was a constructivist approach which allowed the researcher to look at the research phenomenon through multiple lenses and multiple realities.

3.2 The Theoretical Approach

There are three fundamental research approaches used in educational research, the first being the positivist's position, a scientific, hypothesis-testing approach. The second is a constructivist/ interpretivist's approach, where the researcher wants to explore and understand a particular social phenomenon to obtain a deeper understanding of the learning process. The third being a critical approach in which a particular educational situation or policy is challenged and may change the lives of participants (Troudi, 2010).

This research was informed by a combination of the constructivist/interpretivist's approach and a social constructionist theoretical framework. In this approach, knowledge is built through lived experiences rather than passively receiving knowledge through others who have had experiences. In social constructionism, people learn in the world they live and work in by making meanings of their own experiences through interaction with others (Creswell, 2012). These meanings are varied and subjective, being formed through interactions with others and being socially constructed. Culture is an important factor that shapes social reality and the learning experience and contributes to the generation of meanings (Troudi, 2010).

3.2.1 Relevance of the Constructivism Approach

As described in the previous chapter, the constructivist's approach is underpinned by a relativism ontology where reality is observed as being subjective and can differ from person to person (Creswell, 2012). In this approach, realities are individually constructed, thus there can

be multiple realities (Creswell, 2012). This study used this approach to construct meaning of the multiple views of academics regarding the intended role of community-based education and their experiences, and interpret the world from their beliefs and views. It adopted this approach to understand the nature of knowledge acquisition and construction in students at the multiple settings. As the students are from varied cultural and socio-economic backgrounds, this approach could also assist to make meaning of their learning experiences in community-based platforms. The study used this approach to explain each individual's perspective through interactions with each other, and reported on the construction of the multiple realities of all participants to form a holistic understanding of an impression as they perceived reality (Ratner, 2008). As this philosophic worldview sees the world with multiple lenses, this study intended to use multiple platforms to create diversity to contextualise learning in different community based settings within the Department of Health, the private and non-governmental sectors.

3.2.2 The relevance of the Constructivist Approach in the selection of methods

In methodological literature, the selection of methods within the constructivism paradigm are usually qualitative (Niglas, 1999). Qualitative research is inductive in nature with the results leading to a deeper understanding of the phenomenon being studied (Dieronitou, 2014). This study, maintaining a constructivist approach, used mainly qualitative methods for data collection to obtain a deeper understanding of the research phenomenon, and to capture the subjective meanings and interpretations of individual participants to construct a holistic meaning (Rubin and Rubin, 2005). However, to add value to the study, elements of quantitative methods were also used.

In keeping with the constructivist approach, data would be analysed inductively to develop a detailed knowledge of the topic and to allow meanings to emerge from the participants' views (Creswell, 2012). Therefore, this study systematically collected and analysed data using open, axial and selective coding processes to allow themes to emerge from the data (Charmaz, 2006). This methodology was used to generate themes from the data analysis of the qualitative component of the study. The quantitative data was analysed using descriptive statistics with data triangulation being used to consolidate all data analysis to strengthen the study.

3.3 The Conceptual Framework

The framework provided the theoretical foundation of this study with figure 3.1 indicating the various components that contributed to developing a conceptual framework to guide the data

collection and data analysis for community-based training. The framework incorporates the following components:

1. The Constructivist's Approach - this approach allowed the researcher to study the research phenomenon through multiple lens, construct meanings of the multiple views' of all participants and explore multiple sites for student training.
2. The Systems Approach - community-based training requires both a theoretical and practical components to create a system. This system is made up of the education and health systems that must continually work together to ensure successful implementation of community-based training.
3. The Education System - is responsible for creating learning opportunities for dental therapy students to train in community settings.
4. Community-Based Settings - offer multiple real-world learning experiences for dental therapy students.
5. Competency-Based Model - provides a framework to implement community-based training.
6. Theories of Learning - provides a foundation for understanding how learning occurs at community-based sites.
7. The Health System - is responsible for informing the training of dental therapy students and providing training sites for community-based training.
8. Social Justice - helps dental therapy students understand the theoretical basis of the health system.
9. Primary Health Care Approach - provides a foundation for students to learn and practice the principles of primary health care in community settings.
10. Oral Health Care - by being exposed to community-based training, students can provide effective oral health care in diverse settings.

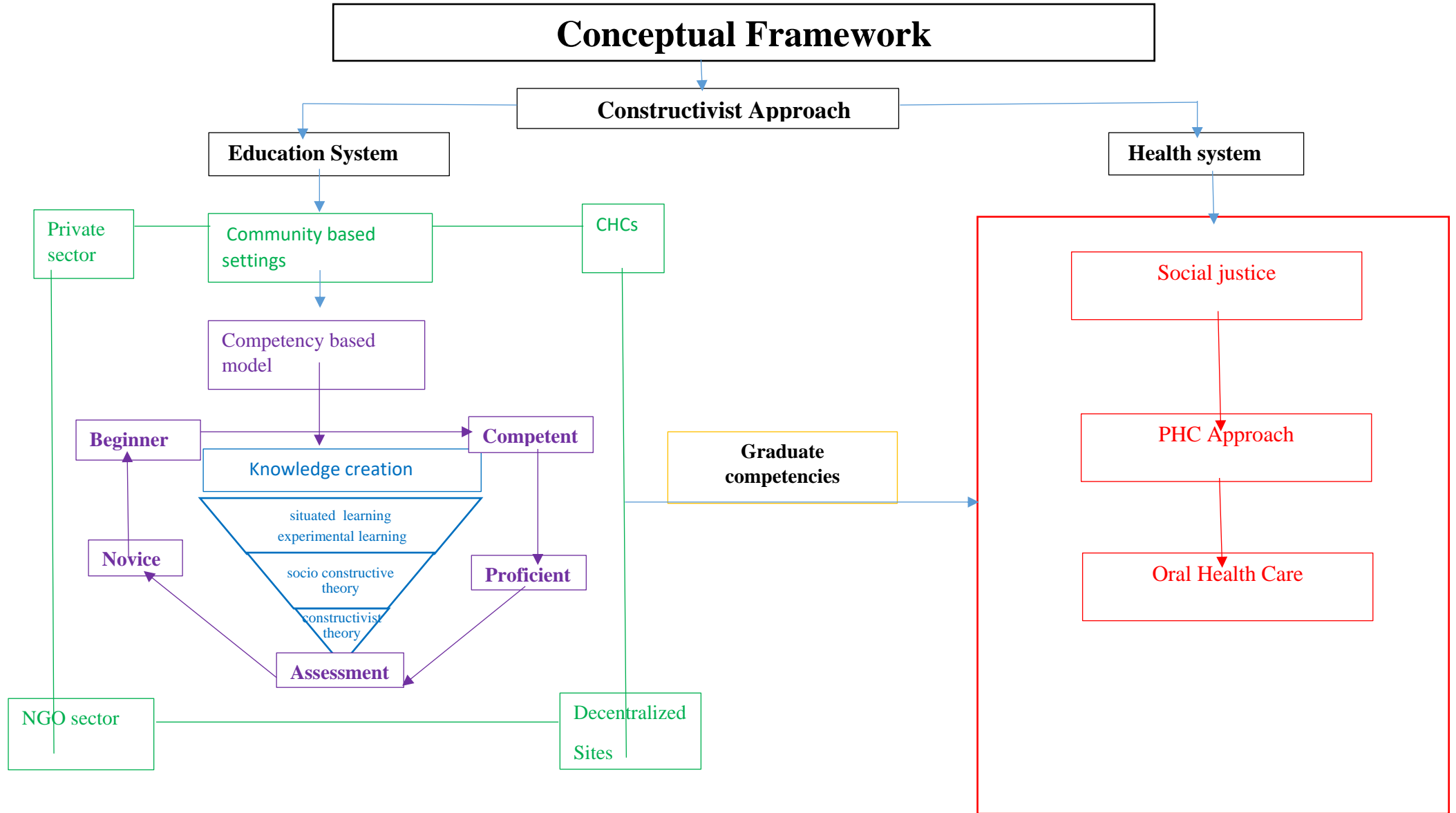


Figure 3.1: The Conceptual Framework

3.3.1 The Constructivist Approach

This was the overarching lens through which the study was conducted. It formed the basis through which the research phenomenon was explored to obtain a deeper understanding of the role of community-based education. The constructivist approach was used to inform the data collection and analysis approaches to construct new knowledge by making meaning of the views of all participants. As this approach sees the world through multiple lenses, this study intended to explore multiple community-based settings in the formal and informal sectors to provide authentic learning experiences for dental therapy students. Thus, the framework would guide the data collection process of exploring various community sites for the expansion of clinical training platforms.

3.3.2 The Systems Approach

Community-based education requires both theoretical and practical components to create a system. This study was underpinned by the systems approach, in which the health and education systems were viewed as sub-systems linked together by the graduate competencies. The health system, is responsible for attending to the needs of the population, which informs the training of health professionals. The tertiary education system is responsible for preparing health professionals to effectively attend to the needs of those using the health system (Frenk et al., 2010). The two components of the system need to continually inform each other as modifications may need to be made to the training of dental therapists to adapt to new approaches to patient management in the health system at an individual and community level. This approach was motivated by the Lancet Commission which found a mismatch in the competencies of health professionals in dealing with current disease burdens and health systems' needs worldwide (Frenk et al., 2010). The framework concentrated on these two systems and guided the data collection to link these two systems together.

3.3.3 The Education System

One of its main goals of the University of KwaZulu-Natal is: *Responsible Community Engagement*, which contributes to the upliftment of the province's inhabitants, and to foster nation-building by connecting with and committing to the communities it serves in a manner that adds value and earns their respect, admiration and trust (University of KwaZulu-Natal, 2017b, Essack, 2014). To achieve this goal, the university seeks to produce socially accountable, competent and relevant health care professionals with skills, values and attributes that are aligned to the provincial and national health priorities, burden of disease and the health

system. The university is thus committed to offering undergraduate and postgraduate education that is community based.

It is the responsibility of the education system to create learning opportunities for student health professionals in community settings to facilitate their transition into the health system. In line with this goal, this study intended to create opportunities for community-based education to produce dental therapy graduates with the necessary skills, values and attributes to effectively meet the oral health needs of communities. Thus, the framework would guide the data collection in this regard.

3.3.4 Community-Based Settings

Community-based settings offer real-world learning experiences for students to construct their own knowledge through reflexive learning (Bates and Jenkins, 2007). Adopting a reflexive approach, students develop a way of understanding the world through construction of knowledge (Bates and Jenkins, 2007). Knowledge can be constructed through interactions with fellow colleagues, clinical supervisors and experienced therapists in the work environment. This study intended to explore opportunities for contextualised learning experiences of dental therapy students in the public, private and NGO sectors through which they could construct their own knowledge. The framework offers guidance in the data collection to select the most appropriate community-based platforms authentic student learning.

3.3.5 The Competency-based Model

This model provided a framework to implement community-based education. It provided a basis for the gradual building of knowledge, skills and competencies essential for a dental therapy graduate. It further demonstrated how the student progresses from being a novice, to a beginner, to a competent, to a proficient practitioner who can be integrated into the health system, fully equipped to meet the needs of communities.

Competency of a graduating dental professional is described as the integration of professional knowledge, appropriate skills and attitudes to holistically manage oral health needs of patients in realistic practice settings (Yip and Smales, 2000). At the hospital based clinical environment, technical skills are well developed. However, it is essential for a student to be able to apply these skills in real-world settings to be regarded as competent. For the successful transfer of skills in natural settings, a student must be able to problem solve, critically assess and think creatively to diagnose and appropriately treat patients with the available resources. By applying these metacognitive abilities, it provides students with opportunities for self-reflection and self-

assessment in the process of life-long learning (Manakil and George, 2011). Through regular contact with patients in community settings, students are also able to develop better communication skills and a deeper understanding of their social backgrounds which allow them to be sympathetic towards their patients.

To assess competency is to test adaptability in the real-world setting. Thus conventional methods of assessment is not appropriate. Instead, authentic methods need to be adopted such as students being required to conduct a range of dental procedures independently and justify the choice of decisions made for treatment planning, dental materials and instruments used (Yip and Smales, 2000). Other assessment methods that could be used included portfolio assessment, log book entries and case presentations (Yip and Smales, 2000). The framework would use the competency based model to analyse the data obtained from students' experiences.

3.3.6 Theories of Learning

The theoretical basis of community-based education is found in the theories of social learning namely the constructivist, social constructivist, situated learning and experiential learning theories. The fundamental understanding of these theories is that students learn through construction of their own knowledge by making meaning of their experiences in authentic learning settings (Fry et al., 2009, Belanger, 2011, Lave and Wenger, 1990, Kolb and Kolb, 2008). The new knowledge gained through experience, shape and amend existing knowledge through practice, experience and reflection (Fry et al., 2009).

These theories show how learning in community-based settings could enhance student's personal and professional development. Through reflective learning, a student is able to apply theory to practice, make a connection of classroom teaching and future practice, developing professional knowledge acquisition through critical thinking, problem-solving and improved clinical skills (Deogade and Naitam, 2016). It further shows that community-based teaching is more than sending students to various community settings, but through this experience, help them appreciate a broader understanding of the social, cultural and economic impact on oral health and general health. In addition, through this interactive learning experience, dental therapy students can learn from others, including peers, advanced students, experienced clinicians who act as role models and students from other health professions. In this way, this study intended to demonstrate that students learning in community-based settings are better prepared to enter the health system. This is an important component of the framework as it

guides the data collection on how students learn and provides a basis of how learning in community settings could be assessed.

3.3.7 The Health System

The health system is in dire need of health professionals who can smoothly integrate into the health system upon graduation and effectively attend to the needs of the communities. An important role of the health system is to inform the training of dental therapy students so that the transition from student to graduate to novice oral health professional in the work environment is better facilitated. The framework guides the data collection on how to provide the health system with oral health workers who can effectively manage the needs of patients seeking oral health care through its public health system.

3.3.8 Social Justice in the Health System

The foundation of health systems are built on the social justice theory which, forms the basis of policies and practices of public health systems to ensure that basic health needs of all members of society, especially the most socially disadvantaged, are met (Powers and Faden, 2006). Social justice also includes basic oral health care to all through the public health system. To ensure access to basic health care for all, it embraces the primary health care approach.

3.3.9 The Primary Health Care Approach

The South African public health care sector uses the PHC approach as a foundation for delivering health services, with patients accessing care at primary and community health care centres with a referral pattern to district hospitals for those requiring advanced care by medical practitioners and specialists. The foundations of the PHC approach is based on principles of equity, prevention, appropriate technology and community participation. The types of care offered are promotion, prevention, curative treatment, rehabilitation and palliative/supportive care. Thus training of health professional students must be aligned to this approach. Therefore, this framework shows that community-based training offers opportunities for dental therapy students to experience learning in the PHC approach. This component of the framework shows how students, learning in this approach can be better prepared to adjust to the public health system.

3.3.10 Graduate Competencies

In line with PHC approach, the CHS seeks to produce socially accountable, competent and relevant health care professionals, with discipline specific technical skills and generic higher education competencies and attributes. The college promotes these skills and attributes by adopting a set of core competencies that have been developed by the Health Professions Council to make graduates become more responsive to the provincial and national health priorities, burden of disease and the health system (Health Professions Council of South Africa, 2014). The graduate health professional should be a compassionate health care practitioner who can communicate with patients across cultures, collaborate with other health professionals and work in varied social contexts. The framework uses community-based settings to demonstrate that through exposure to this type of learning experiences, students could attain competencies that would better prepare them to work in the public sector and forms the link between the two systems, namely the education and the health systems.

3.3.11 Oral Health Care

When students learn in an ideal dental school training centre, they readily adapt to the prevailing surroundings with high level technology and assume this is to be expected when they start working, which is often not the reality. By exposing them to community-based settings, they can easily adapt to the existing reality in the broader social context, and come up with more realistic oral health actions that can appropriately address the oral health needs of communities with the resources that are available. In most cases, this consists of providing the basic oral health care package within the PHC approach, consisting of a dental examination and charting, bitewing and periapical radiographs, relief of pain and sepsis (including extractions), scaling and polishing, oral hygiene instructions and education and the placement of simple restorations (amalgam and composite-1-3 surfaces). In this way, oral health care becomes more accessible to individuals, communities and the population.

3.3 Summary

The conceptual framework developed was based on the constructivism paradigm. It used the systems approach to demonstrate how the education and the health systems could be linked. The health system informed the education system of the profile of health professional required to effectively meet the needs of society. The education system was responsible for training and producing a competent health professional. By adopting a competency-based model with a

strong theoretical underpinning, the education system could create learning opportunities in various community-based settings for dental therapy students to build the competences required to effectively manage the oral health needs of the population seeking care through the health system. The next chapter discusses the methodology used in this study.

CHAPTER 4

METHODS AND MATERIALS

4.1 Introduction

As described in the previous chapter, the theoretical orientation of this study is underpinned by the constructivism paradigm. This approach facilitates the exploration of community-based education using various data sources and methods ensuring that the phenomenon is not explored through a single lens but through multiple lenses to obtain a deeper understanding of the phenomenon. In constructivism, knowledge is obtained through social construction, mainly through subjective understandings of people's experiences and their interactions with each other (Creswell, 2012).

The aim of this study was to explore opportunities for interprofessional community-based training for undergraduate dental therapy students. The main research question developed to address this aim was; what opportunities exist for interprofessional community driven clinical training for undergraduate dental students in the public, private health and non-governmental sectors? To answer this question, objectives were developed to facilitate the data collection process. This chapter outlines the procedure that was followed for the data collection and processing. The chapter describes the study design and methodology used to achieve the objectives of the study. It presents an overall description of how the study was undertaken, the research instruments selected and how the data analysis process was conducted. It also addresses concerns about the validity of the study and ethical considerations.

4.2 Study Design

Since the research phenomenon being studied was complex, the researcher found it necessary to employ several approaches to gain a better understanding of it. Overall, an in-depth exploratory study design was employed, however, descriptive approaches, action research and case study approaches were also used to achieve individual objectives. Action research refers to research undertaken by an educator with the premise of using the data collected to inform future practice to improve student learning (Ferrance, 2000).

In keeping with the constructivist's paradigm, the methodology aligned to this approach is qualitative in nature (Niglas, 1999). Qualitative research focuses on seeking to understand more about the phenomenon in natural settings and, aims to explain its complexity rather than measure it (Leedy and Ormrod, 2005). The study used mainly qualitative methods, however elements of quantitative research methods were used to a lesser extent in order to strengthen

the study. The dominant qualitative approach was used to meet most of the objectives to collect data, mainly through interviews and focus group discussions, and analysed through qualitative methods using thematic analysis. The quantitative method was used to meet two of the objectives. This included data collection through self-administered questionnaires to determine student perspectives of community-based clinical training and the use of data capture sheets to determine the available resources at various sites within the DoH to support clinical training. Both qualitative and quantitative methods were used, recognising the importance and usefulness of both approaches, to collect, analyse and integrate data in a single study (Burke Johnson and Onwuegbuzie, 2004).

4.3 Study setting

This study was conducted in the province of KwaZulu-Natal. UKZN has five campuses (Howard College, Medical School, Westville, Edgewood and Pietermaritzburg), of which, four are located in the eThekweni district. The institution is organised into four Colleges: Clinical Medicine, Laboratory Medicine and Medical Sciences, Health Sciences and Nursing and Public Health. The School of Health Sciences, situated on the Westville campus, consists of eight disciplines: Audiology, Biokinetics, Exercise and Leisure Sciences, Dentistry, Occupational Therapy, Optometry, Pharmaceutical Sciences, Physiotherapy and Speech-Language Pathology.

Various sites for expanding clinical training platforms were explored. These sites included local DoH sites within the eThekweni district for students to make day visits, attend to patients there and return to the institution in the afternoons. Local sites such as Community Health Care Centres (CHCs) and hospitals were explored. In addition, decentralised sites, including periurban and rural hospitals in different regions of KZN, for longer clinical placements where students, would require accommodation for an extended period of time, within the community, were also explored. Additional sites were sought through the private and NGO sectors conducting community-based health care service delivery projects in disadvantaged communities in and around the eThekweni district.

4.4 Methodological Approach

This study was conducted in three phases, with the sampling process, data collection and data analysis of each phase, being described and presented in the methodological approach in relation to each objective as outlined in Table 4.1.

Table 4.1: Methods

PHASE 1			
	OBJECTIVE	ACTIVITY	METHODS
1.	To determine the intended role of community-based clinical training within the College of Health Sciences.	Gain a better understanding of the role of community-based clinical training	Structured interviews with the following: 1.College Dean, Teaching and Learning 2.Academic Leader, Teaching and Learning, School of Health Sciences 3. Head of Professional Board for Dental Therapy and Oral Hygiene-HPCSA 4. HOD-Family Medicine /Rural Medicine. Qualitative data collection and analysis
2.	To explore opportunities for interdisciplinary community driven initiatives for dental therapy students.	Engage with academics from the various disciplines in the School of Health Sciences.	Focus group discussions with academics from various disciplines within the School of Health Sciences. Qualitative data collection and analysis
3.	To identify support for interdisciplinary community-based clinical training in the public health sector within the KwaZulu-Natal Department of Health.	Engage with provincial manager of oral health in KZN. Engage with dental managers of CHCs and decentralised hospitals. Site visits of CHCs and hospitals to inspect resources and infrastructure.	Scheduled Interviews with: 1. Manager of Oral Health Services in KZN 2. Local managers of CHCs in eThekweni district and identified hospitals in KZN 3. Structured data capture sheet for site inspection of infrastructure and resources. Qualitative and quantitative data collection and analysis.
4.	To explore interdisciplinary community-based learning opportunities for dental therapy training in the non-governmental sector in KwaZulu-Natal.	Identify suitable NGO community-based projects that can support student clinical training in and around eThekweni district	Interviews with organising committee of NGOs. Qualitative data collection and analysis
5.	To explore interdisciplinary community-based learning opportunities for dental therapy training in the private sector.	To identify suitable community-based private sector projects in support of student clinical training	Scheduled interviews with managers of community-based projects in the private sector. Qualitative data collection and analysis

Table 4.1: Methods continued

PHASE 2			
	OBJECTIVE	ACTIVITY	METHODS
6.	To explore final year dental therapy students' experiences of community-based training.	Engage with dental therapy students involved in community-based training	Self-administered questionnaires to final year dental therapy students. Quantitative data collection, action research Quantitative and Qualitative data collection and analysis
7.	To determine the attitudes and perspectives of undergraduate Dental Therapy and Physiotherapy students participating in an interprofessional community-based health education programme.	Engage with dental therapy and physiotherapy students involved in a collaborative community driven project. Obtain feedback regarding the project.	Separate focus group discussions with dental therapy students and physiotherapy students Focus group discussion with academic and clinical staff involved with this initiative. Case study, action research Qualitative data collection and content analysis
PHASE 3			
8.	To develop a conceptual framework to guide data collection and data analysis for community based training for undergraduate dental therapy students.	use primary data obtained from phase 1&2 to develop a conceptual framework for interdisciplinary community-based training through deductive strategies	Content analysis using inductive and deductive approaches. Qualitative data collection and analysis

In order to study the complex research phenomenon, eight objectives were developed. To conduct the study in a systematic way, it was divided into three phases with objectives one to five found in phase one, objectives six and seven into phase two and objective eight, phase 3:

4.4.1 Phase 1

The five objectives in phase 1, used different approaches and is discussed according to study design, study participants and data collection methods.

4.4 1.1 Objectives 1 and 2

1. To determine the intended role of community-based undergraduate clinical training within the College of Health Sciences, through an engagement with relevant academic leaders, using semi-structured interviews.

2. To explore opportunities for interdisciplinary community driven initiatives for dental therapy students through focus group discussions with academics from the various disciplines in the School of Health Sciences.

a. Study design

A descriptive, exploratory study design was used for objectives one and two in which the data was collected qualitatively. The views of academics on management level regarding the role of CBE were described using semi-structured interviews and opportunities for interprofessional community-based initiatives for dental therapy students were explored with academics from the other disciplines in health sciences using focus group discussions.

b. Study sample

A purposive sampling method was used to select the study population. They were selected for their expert opinion to provide *“rich information that could add depth to the data collected”* (Teddlie and Tashakkori, 2009). The study sample included the College Dean of Teaching and Learning, the School’s Academic Leader of Teaching and Learning, an academic from Family Medicine/Rural Medicine who is involved in community-based training of medical students, and an academic from the Discipline of Dentistry, who is the Head of the Professional Board for Dental Therapists and Oral Hygienists in the Health Professionals Council of South Africa (HPCSA). The focus group participants included an academic from each discipline, currently involved with community-based training, who were nominated by their academic leaders. Individual invitations for the interviews were sent to the academics to participate, to which they all agreed, resulting in a total sample size of 12.

c. Data collection methods

Data was collected through qualitative methods namely, interviews and focus group discussions. Interviews were conducted with key academics in decision-making positions. The researcher developed an interview schedule, with mainly open-ended questions, to guide the questions. Four face-to-face individual interviews were conducted. The first, being with the College Dean of Teaching and Learning (Appendix 1), consisted of questions that related to the Dean’s views of community-based clinical training, the policies and procedures in place for CBE and funding sources for such training. The second was with the School’s Academic Leader of Teaching and Learning (Appendix 2). Sample questions included: What is the strategic operational plan regarding community-based clinical training for students in the School of Health Sciences? How can individual disciplines align to this plan? The third, was with the academic from Family Medicine/Rural Medicine students (Appendix 3) who shared his experiences of CBE with the medical students, and the last interview was with the HPCSA

representative (Appendix 4) who provided the council's guidelines on CBE for dental therapy and oral hygiene students.

The interviews were scheduled at the interviewees' convenience and lasted between 30 to 45 minutes. All interviews were audio-taped, with the interviewees' permission, to ensure that the responses were captured accurately.

In addition to the interviews, a focus group discussion on community-based education was facilitated in a relaxed environment, to obtain the perspectives of academics (Krueger and Casey, 2000). The researcher sent e-mails to the academic leaders of each of the Health Sciences disciplines to nominate one academic currently involved with CBE to participate in a focus group discussion. Individual invitations for the focus group discussion were then sent to the eight academics, who agreed to participate in the study. Due to all academics not being available at once, two focus group discussions, of four participants each, were facilitated. The researcher developed a set of open-ended questions to guide the focus group discussions (Appendix 5). Sample questions included: what are some of the interdisciplinary collaborative activities that you are aware of, that are being conducted within the School of Health Sciences? What are the opportunities for dental therapy students working collaboratively with other student health professionals to enhance student training within the school? What are the possible barriers perceived for this collaboration? The focus group discussions, lasting approximately 65 minutes, was audio-taped with the consent from the participants.

4.4.1.2 Objective 3

To identify support for interdisciplinary community-based clinical training in the public health sector through semi-structured interviews with relevant stakeholders within the KwaZulu-Natal Department of Health.

a. Study design

An exploratory study approach with both quantitative and qualitative methods was used. The quantitative part used a data capture sheet for an on-site inspection to determine the available resources at each site to support dental therapy student clinical training. The qualitative component used semi-structured interviews.

b. Study Sample

The sample included local and decentralised sites within the DoH. Local sites included Community Health Care Centres (CHCs) and hospitals in the eThekweni district for students to make day visits there, attend to patients and return to the institution in the afternoons. Decentralised sites included hospitals in the different regions of KZN for longer clinical placements where students would be able to provide a continuum of care for patients over a

period of two weeks, requiring accommodation within the community. Sites were selected based on specific inclusion criteria:

- Dental clinics with 3 or more consulting rooms to accommodate a group of five or more students at a time.
- Types of dental services offered including exodontia, restorative and preventive procedures.

Initial selection of the sites were made through telephonic enquiry using a list of provincial hospitals in KZN and the CHCs in eThekwin district. Sites were excluded if they did not have a dental department or having very limited space of one or two small dental surgeries (Figure 1). A final study sample of six CHCs and twelve hospitals were selected. Gatekeeper permission was sought to conduct research at the selected sites (KZ_2015_RP43_50) (Appendix 6)

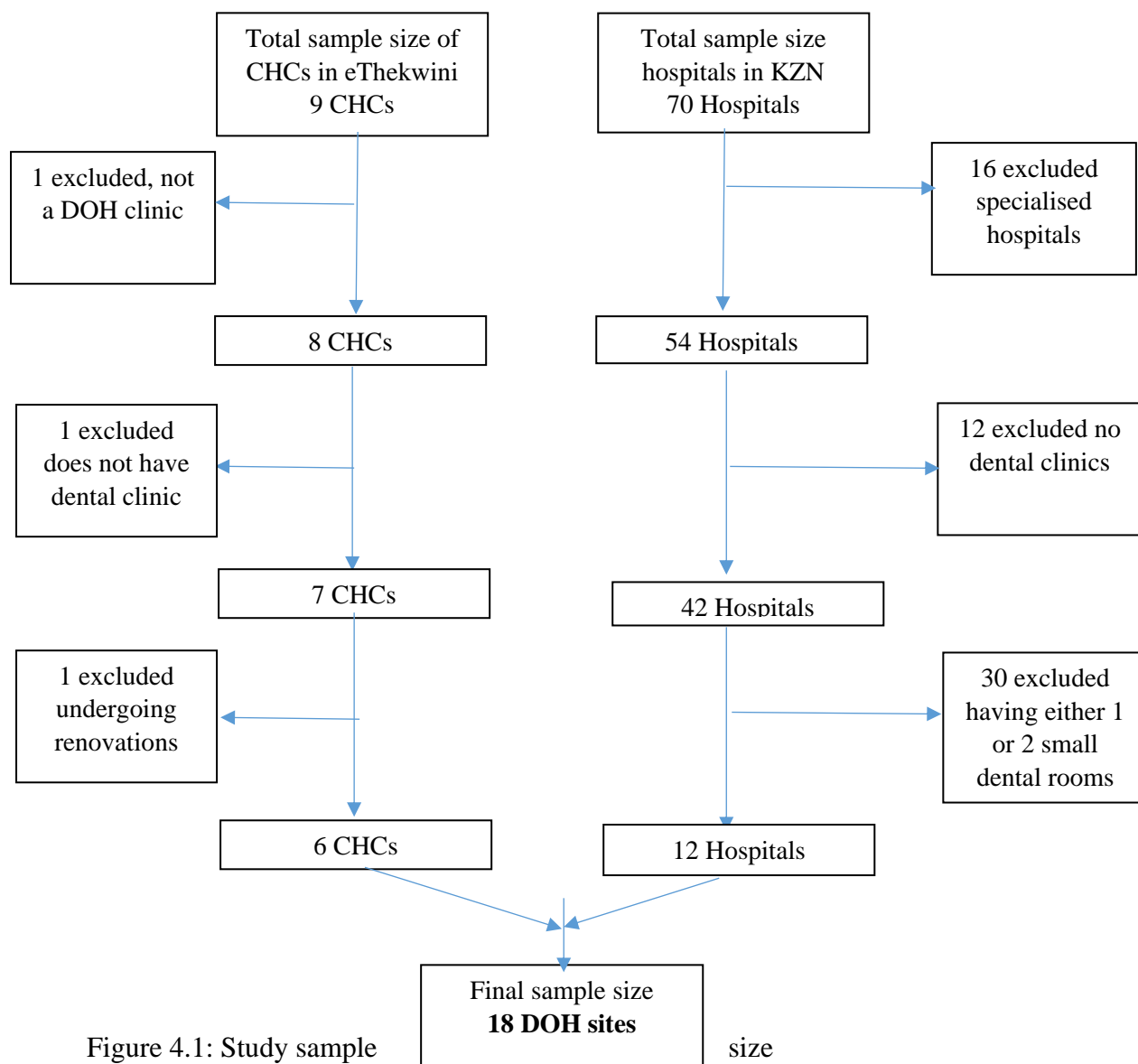


Figure 4.1: Study sample

The selected sites were distributed among the different regions in KZN (Table 4.2).

Table 4.2: Distribution of the study sample

DoH site	Location	Number of sites selected (n)	Sites
Community Health care centres	eThekwini district	n=6	Cato Manor, Phoenix, Kwa Mashu, Tongaat, KwaDebeka & Hlengiswe.
Region 1 hospitals	Urban Complex	n=2	RK Khan & Prince Mshyeni.
Region 2 hospitals	Central KZN	n=1	Edendale
Region 3 hospitals	Western KZN	n=2	Ladysmith & Madadeni
Region 4 hospitals	Northern KZN	n=3	Stanger, Ngwelezana & Mangusi
Region 5 hospitals	Southern KZN	n=4	GJ Crookes, Murchinson, Port Shepstone & St Andrews

The study sample for the qualitative component of objective 3 comprised of participants who were selected using a purposive sampling method. The Provincial Oral Health Manager was selected for his expert opinion and the clinical managers of the selected CHCs and hospitals were also included, making the total sample size 19.

c. Data Collection Process

The data was collected by first meeting with the Provincial Oral Health Manager to determine the opportunities for the implementation of community-based training of dental students in CHCs and hospitals in KZN using an interview guide (Appendix 7). The researcher next met with the clinical managers and then conducted a site inspection. This included face-to-face interviews with the selected clinical managers of the 18 DoH sites. The interviews were guided by a semi-structured interview schedule (Appendix 8) and included sample questions such as; what oral health care services are being provided? What are the opportunities and barriers for clinical training of dental students at this institution? How will student supervision be undertaken? The

interviews, scheduled at the interviewee's convenience, were recorded and lasted approximately 30 minutes.

The inspection of the sites was conducted using a separate data capture sheet for each site to record the available resources (Appendix 9). The data sheet provided the researcher with a checklist to tick off specific items of importance. The sheet included the types of services offered, the equipment for various dental procedures and consumables necessary for such procedures.

4.4.1.3 Objectives 4 and 5

To explore interdisciplinary community-based learning opportunities for dental therapy training through semi-structured interviews with key role players in the non-governmental and private health sectors in KwaZulu-Natal.

a. Study Design

An exploratory study design with qualitative methods in the form of semi-structured interviews were used.

b. Study Sample

Little was known about all informal sector involvement with community-based health projects. To select interviewees, three NGO contacts, known to the researcher, helped to identify further participants through the use of the snowball sampling method. The snowball sample is a non-probability sample method where primary data sources, identified by the researcher, nominate or indicate other potential sources to be used in the study (Dragan and Isaic-Maniu, 2013).

By adopting this approach, a few potential NGOs and people from private sector, who conduct community-based health services, were contacted and asked whether they knew of any other community-based projects being undertaken in the eThekweni municipality. Using the data saturation technique, a total of eleven different community initiatives were identified from both the private and NGO sectors as the study sample. They were selected on the basis of their representativeness of community-based health projects having a dental component. Of the eleven selected, nine were from the NGO sector and two, private enterprises. An invitational e-mail was sent to each organisation to request their participation in the study, to which nine agreed to participate, and provided written informed consent. Of the nine, eight represented the NGO sector and one the private.

c. Data Collection Process

Data was collected through face-to-face, in depth interviews with key people involved in organising community-based initiatives in the NGO and private sectors. Each interview was

conducted separately and lasted approximately 35 minutes. The researcher developed a set of questions to provide structure to the interviews (Appendix 10). Sample questions included:

- What current community based projects are being undertaken by the institution?
- What motivated your institution to undertake this community based health care project?
- What health care services are being provided?
- What oral health services are offered?
- How do you choose the community you wish to assist?
- What opportunities exist for dental student participation?
- What are the opportunities and barriers for other student health professionals to participate in this project in a collaborative interdisciplinary team approach?

The interviews were recorded with the consent of the participants to ensure that all the responses were accurately captured.

4.4.2 Phase 2

In this phase, the final year dental therapy students participated in community-based clinical training at various sites. In addition, students from the Disciplines of Dentistry and Physiotherapy participated in an interprofessional activity. Their perspectives of the experiences were obtained.

4.4.2.1 Objective 6

To explore final year dental therapy students' experiences of community-based training through self-administered questionnaires.

a. Study Design

A descriptive study design with elements of action research, quantitative and qualitative methods was used. Information obtained from objectives 3, 4 and 5 was used to implement community-based learning experiences for the final year dental therapy students and their views were obtained to inform future clinical training practices.

b. Study Sample

The total number of 36 final year dental therapy students for 2016 was considered for the study population. The first and second year students were excluded as they were not involved in CBE rotations. Two students were approached on an individual basis for a pilot study to pre-test the instrument tool for clarity of questions, language and reliability/validity of questions. It was also tested for the time each questionnaire will take to complete and for the need to remove any items that would not yield any usable data. With no changes being made to the questionnaire,

a meeting was held with the remaining thirty-four third year students to invite them to participate, of which 32 students consented.

c. Data Collection Process

The data was collected using a self-administered questionnaire (Appendix 11). The questionnaire survey, developed by the researcher, consisted of mainly open-ended questions (Table 4.3). This was done with the intention of obtaining more descriptive, in-depth information regarding the students' experiences of their clinical rotations. The questionnaire was administered to the students at the end of second semester when all students had completed the CBE rotations. The students were seated, classroom style, with the researcher having distributed the questionnaires to all the students, and being present until all questionnaires were collected.

Table 4.3: Student questionnaire

Questions
What do you understand by the term “community-based education?”
What was the most positive aspect of your experience?
What were some of the challenges you experienced?
What did you learn about the community you served?
What are your thoughts on interprofessional community-based initiatives?

4.4.2.2 Objective 7

To determine the attitudes and perspectives of undergraduate dental therapy and physiotherapy students participating in an interprofessional community-based health education programme, through focus group discussions.

a. Study Design

This was a case-study using a qualitative approach with aspects of action research. Information obtained from objectives 2 and 3 was used to create and facilitate an interprofessional activity involving third year students from the Disciplines of Dentistry and Physiotherapy at a local CHC.

b. Study Sample

The researcher used a purposive sampling method to select the study sample which consisted of students, academics, clinical staff and patients. The student sample included only the physiotherapy and dental therapy students who participated in the CBE rotation at the CHC. During the 2017 academic year, 50 physiotherapy and 36 dental therapy students were

registered for their third year. However, the student sample population consisted only of those students who attended the CHC from March to May, this being 18 physiotherapy and 24 dental therapy students. The two academics, one from each discipline who accompanied the students to the site, and the four clinical staff supervising their training from the two departments in the CHC, were all included. In addition, five patients who were present for the student intervention were also part of the study sample. The researcher addressed all the patients in the waiting area and requested five volunteers to participate in an interview after the presentations. Each participant was approached individually to participate in the study, making the final sample inclusive of five physiotherapy students, six dental therapy students, three dental clinical staff, one physiotherapy clinical staff member, an academic from each discipline and five patients giving a total of 22 participants.

c. Data Collection Process

After the IPE activity, the researcher recruited the participants through individual personal invitation. Three focus group discussions were facilitated. The first being with five students from the Discipline of Physiotherapy and the second, six students from the Discipline of Dentistry using a set of leading questions to guide the discussions (Appendix 12). These questions related to their experience and how the collaboration contributed to their self-development (Table 4.4). The third focus group discussion was facilitated with the academic and clinical staff to obtain their perspectives of the student collaboration. A separate set of questions was developed for the staff (Appendix 13) which included their opinions on the collaboration and how this would benefit students and patients (Table 4.4). The focus group discussions lasted approximately 60 minutes each.

Table 4.4: Focus group questions for students and staff

Focus group questions for students	Focus group questions to staff
<p>What do you understand by interprofessional education?</p> <p>Why do you think it is important for you?</p> <p>What did you know of the other profession before you collaborated with them?</p> <p>What IPE activity did you participate in?</p> <p>How did this benefit you as a professional?</p> <p>How do you think this will benefit the community?</p>	<p>What is your opinion of this Interprofessional collaboration?</p> <p>How do think this will benefit the students?</p> <p>How do you think this will benefit the community?</p> <p>What are some of the activities do you think students could do collaboratively?</p> <p>From your experience, what are some of the topics you think they should cover in their integrated health</p>

<p>What were some of the challenges you experienced when you conducted this activity?</p> <p>How will this benefit you as health professionals in the future when you start working?</p>	<p>education and promotion talks that could benefit the community?</p> <p>What are some of the barriers you perceive may hinder the sustainability of this collaborative work?</p>
--	--

In addition, interviews were conducted with patients to obtain a better understanding of their perspectives of a student-based intervention. As most of the patients' first language was isiZulu, the researcher trained one of the isiZulu speaking dental students to conduct the interviews with the patients in isiZulu. Sample questions included; what is your view of the talk you received? Was the talk clear and understandable? What did you learn from this talk? (Appendix 14).

4.4.3 Phase 3

In phase 3, a conceptual framework to guide data collection and data analysis for community-based training was developed which could be used to guide curriculum development and future planning of community-based activities.

4.4.3.1 Objective 8

To develop a conceptual framework to guide data collection and data analysis for community based training for undergraduate dental therapy students. Data for this objective was obtained using the primary quantitative and qualitative data obtained from the other seven objectives.

4.5 Data Analysis

In the data analysis process, the quantitative and the qualitative data were analysed separately and then triangulated.

4.5.1 Qualitative Data Analysis

The responses from the interviews and focus group discussions from each objective were first transcribed verbatim and then cleaned by a research assistant, after which, the data was organised according to each question. The researcher engaged the services of a research consultant who assisted with the qualitative data analysis. Raw data was converted into

partially processed data in the search of themes leading to thematic analysis (Teddle and Tashakkori, 2009). Thematic analysis involves identifying, analysing and reporting patterns within a data set using an inductive process to generate themes by connecting specific data to a general theme (Braun and Clarke, 2006).

In this study, the six phase process to thematic analysis by Braun and Clarke (2006) to undertake the qualitative data analysis was followed. The researcher and the consultant independently read through the transcripts several times to identify familiar patterns. Initial coding was undertaken by identifying a segment that could be organised into meaningful categories relating to the objectives. This is called open codes which was done manually by writing notes on the transcripts. Several codes were then linked together in axial coding and the core categories were collated through selective coding. The different codes were then sorted and collated into large overarching themes and sub-themes. The researcher and consultant compared the themes worked on independently and collated the themes. The collated extracts were reviewed to check whether they form a coherent pattern and then refined, discarding certain extracts not falling into themes. The themes were defined and named and a final check was conducted to determine if all the extracts fit together to form a theme and all the themes fit together to give an overall 'story'. The analysis was then written up in a coherent, logical way which showed evidence of the themes within the data (Braun and Clarke, 2006).

This process was applied to data obtained from each objective and analysed as the data was being collected. Although data obtained from the objective 6 on the student experiences, was collected using quantitative methods, it was analysed qualitatively using content analysis to correctly interpret the information for a deeper understanding of the impact of CBE on students.

4.5.2 Critical Discourse Analysis

In this study, the theoretical and methodological framework is driven by constructivism where knowledge is socially constructed, co-constructed and dynamic. The data collected was from multiple sources and a descriptive analysis was made on participants' views. However, a critical analysis by the researcher seeks to determine the relevance of the data collected to the real world setting. The aim of any research is the production of new knowledge. Knowledge production is classified into two modes, mode 1 and 2, the attributes of which are given in Table 4.5.

Table 4.5: Attributes of Mode 1 and 2 of knowledge production

Mode 1	Mode 2
Academic context	Context of application
Disciplinary	Transdisciplinary
Homogeneity	Heterogeneity
Autonomy	Reflexivity/social accountability
Traditional quality control (peer review)	Novel quality control

Source: Hessels and van Lente, 2008 This study has characteristics similar to mode 2 knowledge production which ensures that the research is positioned in the broader context and is relevant to society. Thus attributes of mode 2 knowledge production will be considered. While mode 1 knowledge produces results that are generalizable, Mode 2 produces knowledge that is contextualised to a particular setting. In this study it refers to community-based education contextualising clinical training for the dental therapy profession (Hessels and van Lente, 2008). The theoretical perspectives and practical solutions offered, can be transferred to and applied in other disciplines showing transdisciplinary attributes. In this study, students are taken out from the homogenous, closed environment of the institution's training centre and placed in various community or heterogenetic settings showing that knowledge is not only produced in a traditional university setting, but in diverse settings thus demonstrating heterogenic practice (Hessels and van Lente, 2008).

4.5.3 Interpretation of Data

Researcher engagement with the data collected reveals a deeper understanding of the data and how the data collected was perceived by the researcher as being relevant to real-world settings. Although a vast amount of data was collected from various sources, it was acknowledged that there might have been gaps as it was collected in an environment that was very context specific. A challenge arose in trying to get all the selected academics from each discipline to participate together in a focus group discussion due to their busy work schedules and availability. Hence two focus group discussion were conducted. The researcher acknowledges this as a limitation as the minimum participants required for a focus group is five (Krueger and Casey, 2000). Also, the data collected from the private and NGO sectors were very limited as there may be many other community-based projects that the researcher was unaware of the time of data collection. The data collected from the private sector was restricted to only one community-based project as companies of other identified projects refused permission to conduct research. This could be viewed as missed opportunities for active student learning.

Researcher engagement with the data analysis demonstrates the researcher becoming aware of the social consequences of the work produced. The analysed data of the study was perceived by the researcher as being beneficial to society on many levels. Firstly, community-based training could promote students' professional and personal growth. Secondly the institution could become more socially responsible in creating such learning opportunities for students. Thirdly, communities could benefit through improved access to oral health care and lastly, the health system benefits as students graduate with competency skills that align training to the needs of the health system and the population.

The researcher ensured quality control of the data collected through a peer review process. The peers included experts in the field of research such as experienced lecturers in the discipline and the PhD supervisor. The manuscripts developed and accepted for publication were also assessed critically through a stringent peer review process.

4.5.4 Quantitative Data Analysis

The quantitative data obtained from the data capture sheets in objective 3 were analysed through quantitative analysis using a variety of statistical techniques (Teddlie and Tashakkori, 2009). The data from each sheet was extracted and captured using Excel software. All the information was collated to form a comprehensive list of available resources. A descriptive statistical method, where data was summarized to discover trends and patterns in order to comprehend data, was applied. The outcomes of the analysis were presented in the form of tables and graphs.

4.5.5 Data Triangulation

In the analysis process for objective 8, the quantitative and qualitative data using thematic analysis relevant to the narrative data were reviewed. These insights were combined and analysed together through data triangulation (Teddlie and Tashakkori, 2009). All data sets were considered, however, the data was reduced by selecting that which was relevant. The framework was constructed using deductive reasoning of preliminary quantitative and qualitative data.

4.6 Validation of the Data

This study used both qualitative and quantitative approaches, with each approach using different evaluation criteria to ensure rigour of the investigation. In the quantitative approach, validity and reliability were used to ensure trustworthiness of the research findings while in the

qualitative approach, being the dominant approach, trustworthiness was ensured by credibility, dependability, transferability and confirmability.

4.6.1 Qualitative Data

Credibility is a form of internal validity in qualitative research that establishes whether the research findings are genuine and are indeed a true reflection of the participants' original views (Lincoln and Guba, 1985). In this study, credibility was established through the use of varied research methods, namely interviews and focus group discussions to collect the data. Credibility was further established through peer debriefing which was undertaken by the PhD supervisor who reviewed the data collection methods and processes, transcripts and data analysis procedures, and provided guidance to enhance the quality of the research findings (Guba, 1981).

Transferability relates to external validity in qualitative research, which determines the degree to which the research findings can be transferred to other contexts and other respondents (Bitsch, 2005). This was facilitated through the use of purposively selected samples and providing a thick description of the context of the enquiry (Guba, 1981). Transferability was further enhanced by comparing the research findings with current literature.

Dependability is used to determine whether the same research findings would be achieved consistently if the same participants had been used in the same context (Bitsch, 2005). This was achieved through use of member checks, where the analysed data was sent to a few participants to evaluate the interpretations made by the researcher. Dependability was enhanced by both the researcher and the research consultant as a co-coder analysing the same data and comparing the results. Confirmability is establishing if the findings are derived from data coming solely from participants and not just made up by the researcher (Tobin and Begley, 2004). This was established through quotations of actual dialogue of the interviewees. Participant confidentiality and anonymity were maintained through the use of codenames to protect the identity of each participant.

4.6.3 Quantitative Data

The student questionnaire used to explore community-based experiences was tested for validity and reliability. Face validity, which is a subjective assessment of the presentation and relevance of the questionnaire, was ensured by the questions being simple, clear and relevant. This was further enhanced by testing the instrument tool by performing a pilot study. In order

to ensure content validity, the researcher presented the questions that were relevant in a logical yet comprehensive way to measure the intended objectives.

Reliability is computed by taking several measurements on the same subjects. Generally, reliability is done on larger sample sizes. However, in instances where the sample is highly specific, as in this case, it can be used as an approximate measure to determine the reliability. A reliability coefficient of 0.70 or higher is considered as acceptable. The reliability scores for most questions were above 0.70 indicating a degree of acceptable, consistent scoring.

4.7 Ethical Considerations

4.7.1 Ethical Approval

Ethics approval was obtained from the Social Sciences Ethics Committee of UKZN before commencing the study project (HSS/1060/015D) (Appendix 15). A copy of the research proposal was submitted for their examination and approval. The ethical guidelines of the University of KwaZulu-Natal relating to confidentiality, consent to conduct interviews and data management were adhered to. As the study progressed, the topic needed to be amended, thus an amended ethics approval was obtained (Appendix 16).

4.7.2 Gatekeeper Permission

Gatekeepers' permission were sought from various institutions before commencing the research study. Firstly, from the Registrar, UKZN to conduct interviews and focus group discussions with a purposively selected staff and students from the College of Health Sciences (Appendix 17). Secondly, from the KwaZulu-Natal Department of Health, to conduct the interviews with the dental clinical managers and for the site inspection of the community health centres and hospitals, (REF: HRKM 319/15) (Appendix 18). Lastly, from the heads of various NGO and private sector organisations to conduct interviews with selected members (Appendix 19). Research findings will be sent to these institutions in the form of reports and published journal articles.

4.7.3 Informed consent

Informed consent is an acknowledgement by the participant to take part in a research study, with an understanding of all risks and processes involved (Teddlie & Tashakkori, 2009). An information sheet, with an introduction of the researcher, a brief description of the study, including the aim and objectives and contact details of the researcher was given to all participants. A consent form was also attached, which all participants signed before

participating. Consent for the recording of all interviews and focus group discussions was also obtained. Participation was voluntary, with participants being ensured that they had the right to withdraw without any consequences. The researcher adopted the ethical guidelines of the University of KwaZulu-Natal to ensure confidentiality, consent to conduct interviews and the use of information for research purposes.

4.7.4 Confidentiality

The consent form signed emphasised the significance of confidentiality and anonymity. Confidentiality of all participants was assured by not revealing their true identity. Instead, code names were assigned to each to maintain anonymity e.g. A1, A2, A3, etc. Confidentiality was further maintained by assuring each participant that the information given was only accessible to the supervisor and the researcher. The recorded interviews and focus group discussions, saved on a removable storage disc, and the student questionnaires and data capturing sheets of the DoH site visits, will be kept safely in a locked cupboard at the University of KwaZulu-Natal for a period of five years. The storage device will then be burnt or broken and the questionnaires and data capture sheets, shredded.

4.8 Dissemination of Results

The findings of the study will be disseminated among relevant policy makers at UKZN and Department of Health. Research results will also be communicated to the stakeholders from private and NGO sectors who participated in the study. Findings will also be presented at research symposiums and conferences both locally and internationally. Manuscripts from the study will be published as journal articles in peer-reviewed journals both locally and internationally. Students' experiences of CBE will also be presented as oral presentations at discipline and college level.

Copies of published journal articles that emanated from this research will be distributed to all stakeholders involved in the research as feedback from the study. This will include the academics and dental therapy and physiotherapy student graduates from UKZN (2016, 2017) who participated in the study, the provincial and clinical managers in Department of Health, and participants from the private and NGO sectors. A copy of the journal articles will be kept in the Westville library and the Joe Ryan library at the Oral and Dental Hospital for students to access.

4.9 Summary

This chapter described the methods used for this study, providing information on the research design and how the study addressed the research objectives in each of the phases. The phases of the study were presented separately with the methodological approach for each objective being described in detail. A description of the data analysis process for qualitative and quantitative methods was given. A critical discourse reflecting a deeper engagement with the data collected and a broader context of the significance of the study was given. Ethical issues such as ethical approval of the study, gatekeeper permission, informed consent, and issues regarding confidentiality were described. Details of how the results of the study would be disseminated was also described. The next chapter presents the manuscripts that were developed from the study.

CHAPTER 5

MANUSCRIPT PRESENTATION

This chapter presents the results of the research project in the form of manuscripts. This study aimed to strengthen community-based undergraduate dental therapy training at a tertiary institution through an exploration of learning opportunities in the public, private and non-governmental health sectors, using a self-developed conceptual framework to guide this process. To undertake this complex project, various objectives were developed. These objectives guided the research, which was conducted in three phases, as noted in the previous chapter. The process of undertaking the objectives led to the generation of manuscripts. A total of eight manuscripts were developed. Two manuscripts have been accepted by the *African Journal of Health Professionals Education*. The acceptance letters are provided below. The manuscripts are presented in a coherent manner to show how the objectives of the study were met and the overall aim was achieved. The manuscripts appear in the format that was required by the journal it was sent to.

ACCEPTANCE LETTER FROM AFRICAN JOURNAL OF HEALTH PROFESSIONALS
EDUCATION FOR MANUSCRIPT

Tue 2017/10/03 01:50 PM
em.ajhpe.0.564e9c.904f1705@editorialmanager.com on behalf of: AJHPE
<em@editorialmanager.com>

To: Ilana Moodley

Your Submission

CC: singhshen@ukzn.ac.za

Ref.: AJHPE954R1

Strengths and challenges of community-based clinical training as viewed by academics at the
University of KwaZulu-Natal, South Africa.
African Journal of Health Professions Education

Dear Mrs Moodley,

We are pleased to tell you that your work has now been accepted for publication in African
Journal of Health Professions Education.

Thank you for submitting your work to the journal.

Best wishes

Jacqueline van Wyk, PhD
Deputy Editor
African Journal of Health Professions Education

ACCEPTANCE LETTER FROM AFRICAN JOURNAL OF HEALTH PROFESSIONALS
EDUCATION FOR MANUSCRIPT 2

Mon 2017/08/14 01:27 PM

em.ajhpe.0.553545.47ea264b@editorialmanager.com on behalf of;
AJHPE<em@editorialmanager.com>

To: Ilana Moodley

Your Submission

CC: singhshen@ukzn.ac.za

Ref.: AJHPE974R1

Creating opportunities for interprofessional, community-based education for undergraduate dental students within the School of Health Sciences at the University of KwaZulu-Natal, Durban, South Africa: Academics' perspectives
African Journal of Health Professions Education

Dear Mrs Moodley,

We are pleased to tell you that your work has now been accepted for publication in African Journal of Health Professions Education.

Thank you for submitting your work to the journal.

Best wishes

Michael Rowe, PhD
Associate Editor
African Journal of Health Professions Education

Reviewers' comments:

5.1 Manuscript 1

Strengths and challenges of community-based clinical training as viewed by academics at the University of KwaZulu-Natal, South Africa

This manuscript has been accepted for publication in the *African Journal of Health Professionals Education* and has the reference of AJHPE954. It described the views and experiences of academics related to community-based education.

The manuscript addressed objectives one and two of the study which were to determine the intended role of community-based clinical training within the College of Health Sciences and to explore opportunities for interdisciplinary community driven initiatives for dental therapy students with academics from the various disciplines in the School of Health Sciences. It focused on CBE as a pedagogical approach, weighing its strengths and weaknesses and the essential role it plays in enhancing clinical training of health professionals, hence forming a foundation on which this study was based, linking it to the main aim of the study.

The main findings of the study were that the academics participating in the study believed that community-based education was a valuable tool to clinical training of health professionals with many benefits to students, the university and communities, and had the potential to align training to meet the needs of the health system. Challenges to community-based training were identified within the university itself and the Department of Health, however, academics in the study made possible solutions to overcome them.

Strengths and challenges of community-based clinical training as viewed by academics at the University of KwaZulu-Natal, South Africa

Abstract

Background. Community-Based Education (CBE) is seen as a valuable tool in transforming health professionals' education by aligning clinical training to graduate competencies and needs of the health system. However, academics involved in the implementation have varied views.

Objectives. To explore the experiences and views of academics involved in community-based training within the College of Health Sciences at the University of KwaZulu-Natal.

Methods. This qualitative study used interviews and focus group discussions consisting of a purposively selected sample of academics. The interviews were audio-taped, transcribed and analysed using thematic analysis. Ethical clearance was obtained from UKZN.

Results. Three main themes emerged from the data analysis: the strengths of CBE, the challenges experienced in implementation and suggestions by academics to challenges. The

strengths included benefits to the institution, students, health system and communities. The main challenges experienced were insufficient support from the institution and the Department of Health (DoH). Suggestions were made by academics to overcome these challenges.

Conclusion. The study indicates that CBE is perceived to be an important pedagogical approach in transforming health professionals' education in that it can align clinical training to the business plan of the university and the needs of the health system. However, for the successful implementation of CBE, full support from the university and the DoH is required.

Keywords. Community-based education, strengths, challenges, academics' views.

Introduction

Community-based education (CBE) is a pedagogical approach that allows a student to develop professional skills in a community setting and gain a deeper understanding of patients in varied social and cultural contexts.^[1] From the literature, CBE is shown to be beneficial to students in various ways including improved practical skills and clinical reasoning, increased self-confidence and developing a positive attitude toward patients.^[2, 3, 4, 5] By experiencing real work situations, students develop a greater awareness of the responsibilities they have as health professionals.^[4] Through student placements in community-based settings, CBE is shown to be equally beneficial to communities with improved access to health care and improved quality of care due to the use of current practice techniques.^[4, 6] Communities also benefit through home visits and health promotion activities undertaken by students.^[4] Health systems have also been noted to benefit from CBE as students are seen to expand the workforce especially in rural areas where there is a scarcity of health care workers.^[6] Moreover, student CBE placements in rural areas have the potential to influence students' responsiveness to community needs and their future decisions to work in these areas.^[4] This can contribute to long term benefits for the health system. Institutions of higher education that implement CBE programs are viewed as demonstrating social accountability.^[7]

Health professionals' education is undergoing major reform due to two main external influences. Firstly, the Council for Higher Education that advocates the integration of community engagement into curricula in the South African context.^[8] Secondly, the Lancet Commission that called for health professionals to graduate with appropriate competencies to be fully functional in a patient and population-centred health system.^[9] Given this context, the University of KwaZulu-Natal strives for reform through its goal of responsible community

engagement as outlined in its vision and mission statement. This goal aims to transform health professionals education from a traditionally structured basis to a more competency based focus that adds value to the communities it serves. ^[10]

To drive this goal, the College of Health Sciences (CHS) at UKZN has embarked on a business plan to adopt a Primary Health Care Curriculum (PHCC) to address both service delivery and health professional training. ^[11] The business plan proposes that a Primary Health Care (PHC) approach be followed for all programmes offered by the CHS. ^[11] In line with this approach, the CHS seeks to produce socially accountable, competent and relevant health care professionals with discipline specific technical skills and generic higher education competencies and attributes. In this way, graduates become more responsive to the provincial and national health priorities, burden of disease and the health system. The College is thus committed to offering undergraduate and postgraduate education that is community based. ^[11] Community-based clinical training is seen as a valuable tool in transforming health professionals education to meet graduate competencies and the needs of the health system. ^[9] Thus, to foster these competencies, UKZN creates learning opportunities for health professional students to engage in activities that can enable them to acquire these skills and values in community-based settings. From the reviewed literature, there are many studies highlighting students' experiences and views of CBE. However, there is a paucity in the literature on the views of academics directly involved with the implementation of CBE. The objective of this study is to present the experiences and views of academics currently implementing community-based training within the College of Health Sciences, UKZN.

Methods

Research setting and context

The College of Health Sciences at UKZN comprises of four schools; Clinical Medicine, Laboratory Medicine and Medical Sciences, Nursing and Public Health and Health Sciences. The School of Health Sciences has 8 disciplines; Disciplines of Audiology, Biokinetics, Exercise and Leisure Sciences, Dentistry, Occupational Therapy, Optometry, Pharmaceutical Sciences, Physiotherapy and Speech-Language Pathology. Clinical training in these disciplines occur at campus clinics and designated off-campus sites. Community-based education is a prominent feature across all disciplines, however the level of participation differs. Moreover, as part of the business plan, disciplines are expected to send students to decentralised training

sites i.e. to regional and district hospitals and community health care centres around these hospitals.

Research design

This was a descriptive qualitative explorative study in which the intended role of community-based clinical training in the College of Health Sciences was explored and the views of academics involved with CBE were described.

Participants

A purposive sampling method was used to select the study sample. The participants selected for the interviews included the College Dean of Teaching and Learning, the Academic Leader of Teaching and Learning and the Head of Department: Family Medicine/Rural Medicine. They were selected for their expert opinion. One academic, currently involved with CBE from each discipline in the School of Health Sciences, was purposively selected for the focus group discussions. The researcher sent an invitational e-mail to each participant. A total of 11 participants (A1- A11) gave written informed consent to participate in the study.

Data collection

Data was collected by using a combination of interviews and focus group discussions. Firstly, the researcher conducted in-depth individual interviews with the Dean and Academic Leader to glean a better understanding of the role of CBE and how it should be rolled out at discipline level. The researcher developed a set of leading questions to provide a relevant structure to the interviews (Table 1). The interviews focused on the policies and procedures for implementation of CBE; support and mechanisms for CBE and funding. Secondly, a separate face-to-face interview was held with an academic from the School of Clinical Medicine (the Head of Department: Family Medicine/Rural Medicine). The purpose of this interview was to get a better understanding of CBE experiences in other schools within the College of Health Sciences. The interviews were scheduled at the interviewees' convenience and lasted approximately 30 minutes. Lastly, the researcher facilitated focus group discussions with academics representing each discipline. Due to all academics not being available at once, two focus group discussions were held. The researcher developed a set of open-ended questions to guide the focus group discussions (Table 2). The discussions were related to their current CBE projects and how this added value to their current clinical training practice as well as the

challenges experienced in implementation. The focus group discussions lasted approximately 65 mins.

This study was part of a larger study conducted on CBE in the School of Health Sciences. Ethical clearance was obtained from the Humanities and Social Sciences Research Committee, UKZN (HSS/1060/015D).

Table 1. Interviews with Dean and Academic Leader

<u>Interview with Dean</u>	<u>Interview with Academic Leader</u>
What is your view of community-based clinical training in the education process of health professionals within the School of Health Sciences?	What is your view of community-based clinical training in the education process of health professionals within the School of Health Sciences?
In your opinion, how will this add value to current teaching strategies for clinical training in terms of meeting graduate competencies and meeting needs of the health system?	In your opinion, how will this add value to current teaching strategies for clinical training in terms of meeting graduate competencies and meeting needs of the health system?
What policies and procedures are in place for community-based clinical training?	What is the strategic operational plan present/envisioned by the School regarding community-based training of health professionals?
What mechanisms and support can the school provide for community-based clinical training?	How can disciplines within the school align to this plan?
How will community-based clinical training be funded?	How should community-based training be integrated into the current curriculum?

Table 2. Focus group discussions with Academics

Kindly share your thoughts on the University's goal of community engagement and community- based education for health sciences' students.
What are your views of how this can be implemented at discipline specific level?
What is the current practice of community-based training in your discipline?
In your view, how does community-based teaching and learning add value to your current clinical training strategies?
In your opinion, how can community-based clinical training align to the Primary Health Care Curriculum Model (PHCCM) that aims to address service delivery and training of health care professionals?
In your view, how can community-based teaching align to the health professional graduate attributes in the various roles of health care practitioner who is compassionate and culturally sensitive, communicator, collaborator, leader, scholar and advocator as envisioned by the College of Health Sciences?
From your experience, what are some of the challenges experienced in implementing community-based training?

The researcher audio-taped the interviews and focus group discussions. A research assistant transcribed the recordings verbatim and then did a data clean-up process. The researcher engaged the services of a research consultant to assist with the data analysis process. This

consisted of data coding to identify particular features of the data set and then sorted, allowing themes and sub-themes to emerge from the respondents' statements according to Braun and Clarke's guide to thematic analysis. ^[12] Credibility was established through use of varied research methods, namely interviews and focus group discussions to obtain the data as well as peer debriefing. Another member of the research team conducted the peer debriefing by looking at the data collection methods and processes, transcripts and data analysis procedures and provided guidance to enhance the quality of the research findings. ^[13] Transferability was facilitated through detailed description of the enquiry and purposive sampling. ^[14] Transferability was further enhanced by comparing research findings with current literature. Dependability was achieved through use of a co-coder (research consultant) and confirmability was established through the direct quotation of interviewees. Participant confidentiality and anonymity were maintained.

Results and Discussion

Based on the responses of participants in the interviews and focus group discussions, three main themes emerged from the data analysis process: strengths of the community-based clinical training, challenges experienced and suggestions by academics.

Strengths of community-based education

This study revealed that CBE was viewed by academics as being beneficial at multiple levels. The following section contains a selection of illustrative quotations of the benefits of community-based clinical training. The quotes are displayed below on an institution, student, health system and community level.

Benefits to Institution

An academic reported that through CBE the institution could achieve its goal of responsible community engagement by producing socially accountable health professionals. It could create a platform for the institution to implement its policies and teaching strategies as illustrated by the following quotes (Table 3).

Table 3: Benefits to the institution

Benefits arising	Participants' quotes
Meaningful community engagement	'We are trying to train competent, relevant, socially accountable health professionals, what better way than to let them go into the community...So we are giving back as a university and, as existing and potential health care professionals equally, we are gaining by being trained and fulfilling our criteria for our degree to practice as health care professionals.'(A1)
Implementation of policies	'It allows us to implement the policy frameworks of the DoH provincially as well as nationally and it allows us as a College to really give effect to our own vision and mission whether it is the Teaching and Learning Office and teaching and learning related to research to general University vision and mission and goals. I think we are in the right place at the right time.' (A1)
Facilitating implementation of various teaching strategies	'Community based training requires a certain type of pedagogy of interactive participative learning. There are frameworks and pedagogies that have been implemented in different programs...but I think we have got some excellent examples of good practice that we can learn from each other and implement.' (A1)

Related to its mission and vision statement, UKZN, has set out goals to be an academic institution actively engaged to redress the disadvantages and imbalances of the past. ^[10] The goal of responsible community engagement can be driven through CBE initiatives. By integrating CBE into the curriculum, the university is showing social accountability. This can contribute to the upliftment of the province by producing socially accountable health professionals and serving under resourced communities. Literature also shows that higher education institutions with a socially accountable mandate can have positive influences not only on students but surrounding disadvantaged communities with better health outcomes. ^[15] Through implementation of policies and teaching strategies related to CBE, the institution can be seen as facilitating the transition of traditional approaches of teaching to competency-based approaches that align training to health needs of communities and the health system. ^[9]

Benefits to students

Academics believed that CBE could allow students to develop professionally. Students could improve clinical skills and proficiency and critical reasoning by being exposed to many patients. They could also learn by working closely with experienced colleagues in different clinical settings. At a deeper level, it could also help them to relate theory to practice and acquire graduate competencies such as compassion, better communication and leadership skills. These skills are not necessarily obtained in classrooms (Table 4).

Table 4: Benefits to students

Benefits arising	Participants' quotes
Improving clinical skills	'Our students get to attend to more patients in the same time they attend to one patient at the clinical training site.'(A6)
Acquiring critical reasoning	'They also do not come in with a readymade diagnosis...Here they just have to think on their feet and problem solve on site.' (A5)
Learning from mentors	'They are also exposed to different supervisors with their own clinical expertise.' (A6)
Adapting to different work environment	'Working within the communities prepare the students for when they qualified ... they learn to work with what they have available.' (A6)
Relating theory to practice	'The students will provide a service that they have already demonstrated theoretically they have the knowledge and through the provision of the service they will develop the clinical competencies.' (A4)
Applying PHC principles	'Students do a lot of broad-base promotive and preventive work throughout the communities.' (A7).
Providing appropriate care	'...It is also looking at what is relevant and appropriate for this context not only socioeconomically but geographically. There is a focus on bringing in the family and the broader community where possible. Where there is somebody isolated at home the rehab is focusing on the families sometimes even the neighbours or community care givers and using the resources that are in the community.'(A4)

Achieving non-technical competencies	<p>‘It is kind of starting to realise that the patient is a person who has a family and if they understand where the patient comes from they will treat them completely differently. There is a potential for a much deeper, nearly like an ontological shift that takes place.’ (A3)</p> <p>‘... It is also adding value in terms of the non-clinical aspects. All those things like teaching them how to be leaders in an under resourced environment, to communicate better when there is a language divide. We find that the campus-based, more resourced training environments was just letting them think in that sort of clinical, mechanical fashion, but now they are forced to be able to apply other skills in that context.’ (A8)</p> <p>‘I do not think the university sufficiently teaches these competencies or tries to shift thinking in any way possible, we just want to get through the content of the curriculum. This is the right environment where we shift their thinking, where we mould them into what we would like them to be.’(A5)</p>
Opportunities for postgraduate studies	<p>‘There are some postgrad projects at Master’s and PhD levels where research is done in communities.’ (A11)</p>

It is well documented in the literature that CBE has shown to enhance students’ self-development, improving competence and confidence levels through increased patient exposure in community settings. ^[1] Graduate competency can be defined as acquisition and application of knowledge, clinical skills and values to provide effective care to patients. ^[11] This study showed that CBE could create learning opportunities for students to acquire these attributes. These findings were similar to that of Mabuza et al. (2013) who found that the main focus of CBE was the learning of practical skills, professional behaviour and relating theory to practice. ^[16] However, Ferris argues that for CBE to be more meaningful, students should not just be left at these sites to acquire practical skills only, they should be given opportunities to self-reflect and self-assess which can contribute to life-long learning. ^[17]

Benefits to the health system

According to academics, the health system could also be strengthened through CBE initiatives. Benefits included building sustainable partnerships, making health care more accessible to communities and aligning the health professionals training to the needs of the health system which could make them easily employable (Table 5).

Table 5: Benefits to the Health System

Benefits arising	Participants' quotes
Building sustainable partnerships	'The business plan of community based training and the primary health care model was developed in conjunction with the Provincial DoH so it has the endorsement and support from key role players in terms of implementing it. So we will have the clinical training platforms with the DoH and hopefully we will have the staff to assist us in doing that.' (A1)
Making health care more accessible	'The focus is ideally on taking rehab services into the underserved.' For example; for a mum with cerebral palsy child ...She might only get therapy once a month..; she might have to make two taxi trips to get there (local hospital). If she is taking her child that is two taxi fares and if he is on a wheel chair that is a third fare. It is not about not having access, it is about the reality of that access...' (A4)
Learning how the health system operates	'They are actively going out and we have made an attempt to get them right down to clinic level and not just hospital level so they understand how the health system works right from the start.' (A8)
Producing work-ready graduates	'...with community based training, we are trying to implement the policy frameworks and train our students such that they are capable of working in the primary health care environment equally well as they will be working in tertiary services for them to be proficient across the continuum.' (A1)

By collaborating with DoH, a mutually beneficial relationship can be developed. The university benefits as their clinical training platforms could be significantly expanded. The DoH benefits as students could complement the current workforce in under resourced areas, improving access to health care. This is further supported by Mabuza et al. (2013) in that students are viewed as important members of the health team and are appreciated and welcomed by communities. ^[17] Students exposed to CBE in rural areas could gain a better insight to inequalities of health care and could be motivated to return to these areas to seek employment. A study by Kaye shows that community-based clinical training changes students' attitudes towards rural practice and plays an important role in influencing graduates to work in underserved areas. ^[6] In addition, students could have first-hand experience of how the health

systems operates, facilitating their transition to the work environment. This finding is further supported by Knight who found students gained a better understanding of the policies and politics of clinics while in training.^[18]

Benefits to communities

This study revealed that communities could benefit greatly from CBE initiatives. Most disciplines chose underserved communities to undertake their projects to provide or improve access and affordability to health care services. (Table 6)

Table 6: Benefits to the community

Benefits arising	Participants' quotes
Improving service delivery	'The priority is to offer a service to the underserved...focus particularly on people, children largely with disability in communities who either are unable to or have enormous challenges accessing the services that are available.' (A4)
Committing to sustainable services	'It is important that we need that continuity in a community if you start providing a service you must commit to it. We cannot use the community and if only to take the students there, they start something off and then we take them out it is also not fair to the community.' (A2)
Promoting health in the communities	'Students engage directly with the community, determine their needs and do promotive and preventive work outside of the clinic base.'(A7)
Interacting with communities	'With the community home stays project where for the rural block we offer some students to live in the community... students engage with hosts mothers... they are quite motherly.'(A3)

This study findings of benefits to communities were similar to that of Diab and Flack who found that the primary benefit to communities was improved service delivery. ^[4] By students living in the communities, they can become immersed with the realities of communities. ^[7] They can develop a better understanding of the disease burden and the social and cultural aspects that impact on health. This finding is supported by Kelly et al. that learning is developed through rich relationships with community members and further supported by Doherty that through interaction with patient, family and community, students learn through exposure to an

integrated primary health care experience. ^[5,7] However, Diab and Flack argue that communities received maximum benefits if the CBE initiatives were aligned to community needs. They also argued that it is important to engage community leaders before student placements to explain their function as communities feel undermined if not informed of students' presence. ^[4]

Challenges

This study shows that although academics embraced the pedagogical approach of community-based clinical training, they experienced challenges that could hinder implementation. The following section contains a selection of illustrative quotations of the challenges of community-based clinical training. The quotes are displayed below on challenges at the University and DoH levels.

Challenges at the University

The challenges at the university included not having a clear operational plan, cooperation of all academics, support from the university and logistical issues.

No clear operational plan

At the University, the organisational structures are three tiered; the college level, school level and discipline level. Although the business plan was being rolled out at college level, there seemed to be no clear operational plans or communication on how this had to be filtered down to individual disciplines in the school. While academics from individual disciplines believed that there should have been direction from the college and school levels, academics from these levels believed it should be driven by committed academics in individual disciplines as illustrated by the following conflicting quotes:

‘This clinical training model was conceptualized and while it was good and we all supported it on theory there was no situational analysis,... no plan as to how we are going to roll it out based on the situational analysis, we cannot just say we have this plan... the DoH needs help where our students get exposed. Let us just go and do it.’ (A8)

Academics from college and school level firmly believed:

‘It is people from the ground, from various disciplines who are very passionate about this and who are committed people that will investigate it thoroughly, come out strategically, logistically, resourcefully draw up their own mandates with their own roles and responsibilities.

So it is more bottom up. It will never be top down. It will be you having to push from the bottom and finding the ways of making things happen.’ (A1)

Cooperation of all academics

Academics that represented individual disciplines in the focus group believed that they were the only ones responsible in their respective disciplines for CBE, other staff members seem disinterested and if they were to leave, the CBE initiatives will fall apart as quoted below:

‘If I go, the project from my discipline will fall apart, that is unfortunate. We have become the face of the community. ... if there is not a voice to speak for it, it falls apart because it is not entrenched in the curriculum. It is hard work and it is time consuming that is why nobody wants to do it.’ (A4)

Support from the University

There seemed to be a mismatch between the support given by the college and that received by academics. While academics at college and school level endorse and support CBE, academics involved in implementation think otherwise:

‘There needs to be supporting structures in place as much as they are saying do the community outreach they should have things in place for us because there are lots of projects we start and have to stop because of resources etc.’ (A4)

The study also highlighted that there were no incentives for staff participating in community engagement:

‘Do we get rewarded for community engagement? Is there any structure for community engagement? We have got a research office; we have got a teaching and learning office. Is there an office for community engagement? ... it needs to be taken seriously.’ (A3)

Logistical issues

The results of the study showed that many challenges were logistical in nature including funding, limiting timetables, CBE being time-consuming and community issues:

Funding: ‘We have costs to consider when going out to communities. The main reasons we were pulled out of a very effective and established project was the cost to transport the students.’ (A4) ‘Even with us, the consumables that we require, the cost factor. A lot of our projects has a problem to sustain itself because we do not have resources.’ (A6)

Timetables: ‘We have a university timetable that does not allow for integration of disciplines.’(A4)

Time consuming: ‘I had a student two weeks ago who wanted to go and do a follow up assessment on a child. She cannot go and do that independently and the home visit is way into the community. The time now for me to go and observe and check on her means a whole morning.’ (A4)

Community, political and safety issues: ‘We had followed everything in the book, the gatekeeper introduced us to everyone and the next thing, we got thrown out from our placement site which was a high school because of the political nature of the community. They thought we were aligned to someone who they were in conflict with. It was the gatekeeper himself. Although we were independent from him and he introduced us, but we got parcelled with him...’ (A7)

Challenges at the university stem mainly from a lack of support from school and college level. Support in the sense of effective communication down to discipline level, guidelines on how CBE programs should be implemented, expectations and roles of academic staff and financial support. These challenges are not unique to this institution, similar challenges were noted in previous studies with the main challenges being leadership support, funding and academics not willing to participate in the program. ^[19] Doherty also found that CBE programs are complex and time-consuming and requires sustained hard work of committed academics. ^[7] CBE is viewed as a mechanism for the university to demonstrate social accountability. It should therefore provide the structure and support for successful implementation of this program. In addition, it should be supported by more academics within disciplines not only those that have an interest in this.

Challenges with the DoH

The challenges experienced with the DoH were mainly due to clinical staff not clearly understanding their role in community-based training of students or not being aware of it. Academics were dependent on DoH staff for supervision of students, monitoring their attendance and writing reports on them at decentralized sites, however, there appears to be a lack of commitment from some clinical staff and students were sometimes seen as a burden and impeding their work as illustrated in the quotes below:

‘There are perceptions from the DoH that this is an outside program or an outside responsibility that is being imposed on them. There was no plan that was filtered down to the ground. There was this memorandum of understanding between the DoH and UKZN, but the people on the ground they are not really aware of it. (A8)

‘We made arrangements with the head of department to supervise our students. He was very enthusiastic, however other personnel were not so eager to supervise as they felt that students slowed down their work pace.’(A6)

The challenges with the DoH was similar to that of the university in the sense of not having any guidance from higher authorities. This lack of support for clinical staff can be viewed as a missed opportunity for shared responsibility of this program. This can hinder student learning at DoH sites as it has been shown that staff enthusiasm for student supervision enhances student learning.^[16] It is important for academic staff to provide support for clinical staff in orientation and training in student supervision as Archer noted that clinical supervisors changed their perceptions about student supervisions after a short course designed by the university.^[20]

Suggestions by academics

The study revealed that academics viewed community-based education as being extremely valuable and they were eager to make it work despite many challenges. The following are illustrative quotations of solutions they offered:

Challenges

Possible solutions

No clear operational plan:

‘There needs to be a core team. We need to sit together and come up with objectives for CBE training, this is the output and this is what we expect of the staff and students.’

‘Without leadership there is nobody steering the ship. Leadership is critical to develop or put together this framework so we can roll out this community- based teaching they expect from us.’ (A10)

Challenges with DoH:

‘The one solution that we had was train the trainer. We bring all the clinical staff into university, we get a workshop going and then we do programs with them and then we do sessions at the end where we get them to watch. We were thinking of getting videos and getting them to watch during and assess so there is inter-reliability.’ (A10)

‘Maybe those trainers should be given some sort of honorary appointment or give them some sort of incentive for them being involved in the training of our students because they will tell you that look I have queues to push...’(A9)

Communication issues

‘There should also be good, open communication within the institutions and between the institutions especially to the people on the ground who are directly involved with CBE programs.’(A6)

This study shows that academics have the enthusiasm to drive the community-based clinical training agenda. South African health professionals’ education is transforming. ^[17] CBE is certainly a mechanism of change toward this transformation in making clinical training more meaningful in the South African context. Transformation is an ongoing process and academics should seize this opportunity for academic autonomy and control over CBE as it has been shown to have great value in the education process of students in the Health Sciences. This is further supported by Doherty that CBE programs should be driven by champions within disciplines especially if there is resistance from other staff. ^[7] While there are committed academics from the institution, there should also be committed health professionals from DoH supervising students at the teaching sites. CBE should be regarded as a shared responsibility of the collaborating institutions to ensure success and sustainability.

Limitations of the Study

It is acknowledged that this study is limited to only one university and the findings related to the views and opinions of academics who participated in the study are limited in their generalizability. Therefore, more research is required at other universities in South Africa to obtain wider, broad-based opinions of academics regarding CBE.

Conclusion

The study indicates that CBE is perceived to be an important pedagogical approach in transforming health professionals’ education in that it can align clinical training to the business plan of the institution and the needs of the health system. Academics play a pivotal role and are seen as drivers of CBE. However, for the successful implementation of CBE, there needs to be full support from the university and DoH to overcome any challenges that may arise.

Author contribution

I. Moodley¹ was responsible for data collection, data analysis and conceptualisation.

S. Singh² was responsible for refining the methodology and overseeing the write-up.

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5.2 Manuscript 2

Creating opportunities for interprofessional, community-based education for undergraduate dental therapy students within the School of Health Sciences at the University of KwaZulu-Natal, Durban, South Africa: Academics' perspectives

This manuscript has been accepted for publication in the *African Journal of Health Professionals Education* with the reference being AJHPE974. This study focused on exploring opportunities for interdisciplinary community driven initiatives for dental therapy students through focus group discussions with academics from other disciplines within the School of Health Sciences.

Manuscript 2 linked to objectives one and two by recognising the value of CBE and the significance of getting students from various health sciences disciplines collaborating and learning together while in training. By engaging with academics from the various disciplines, it was possible to create collaborative learning opportunities for students to work together, thus forming the link to objective two and link to the main aim of the study.

The results of this study showed that participants in the focus group recognised the value of different disciplines working together. They believed that engaging students in interprofessional interventions exposes students to knowledge and skills of other professions, and that by understanding the scope of practice of other professionals, they could learn to refer patients appropriately in the future. Participants believed that many opportunities could be created for dental therapy students to participate in interprofessional, community-based activities, on various platforms, including schools, primary health care centres and other community-based settings. However, the main challenge, as noted by them, was finding a common time for students from different disciplines to participate in interprofessional activities.

Creating opportunities for interprofessional, community-based education for undergraduate dental therapy students within the School of Health Sciences at the University of KwaZulu-Natal, Durban, South Africa: Academics' perspectives

Abstract

Background. Interprofessional Education (IPE) provides opportunities for students from two or more health profession disciplines to learn with, from and about each other to foster collaborative practice in the future when health professionals are expected to work in health care teams. While there are many documented examples of IPE among student health professionals in the literature, dental therapy student participation in IPE has been excluded.

Objectives. To explore the opportunities for dental therapy students to participate in collaborative interprofessional, community-based initiatives by engaging with academics in the School of Health Sciences at the University of KwaZulu-Natal.

Methods. This qualitative study used audio-taped interviews and focus group discussions with a purposively selected sample of academics and the results being thematically analysed. Ethical clearance was obtained from UKZN.

Results. The academics noted several opportunities for dental therapy students to participate in interprofessional, community-based education on various platforms, including school, primary health care and other community-based settings. Barriers that may hamper implementation include finding a common time for IPE in the uniprofessional curricula, matching student numbers and staff support.

Conclusion. The study findings revealed that opportunities do exist for interprofessional community-based educational interventions for dental therapy students. However, creation and implementation of interprofessional interventions require individual lecturers as drivers across all disciplines.

Keywords: Interprofessional, collaboration, opportunities, dental therapy students, Health Sciences, UKZN

Introduction

Health professionals' education is undergoing major transformation whereby community-based and interprofessional education are being integrated into curricula to align student training to meet the needs of the communities they are likely to serve and the health systems within which they will work.^[1] Interprofessional Education (IPE) is an innovative learning strategy that breaks down professional silos which commonly occur in training institutions.^[2] This strategy provides opportunities for students from two or more health profession disciplines to learn with, from and about each other, or collaborate to provide promotive, preventive, curative and rehabilitative services to patients in an attempt to enable students to work effectively in health care teams upon graduation.^[2, 3]

There are many examples of IPE among student health professionals documented in various institutions, both in South Africa and internationally, however, participation by students in the field of Dentistry has been minimal or non-existent.^[4] Students in the field of Dentistry include dentists, dental therapists and oral hygienists in training, their omission being based on the

presumption that oral health is considered to be separate from general health,^[4] yet it is integral to general health and well-being.^[5] Routine dental examinations can result in the early detection of certain systemic diseases that manifest in the oral cavity, making dental personnel important members of a team that manages the overall health of a patient through screening, diagnosis and referral.^[4]

Although highly prevalent, oral diseases are largely preventable, and share common risk factors, including unhealthy diet, excessive tobacco use and harmful alcohol consumption with other leading non-communicable diseases (NCDs), such as diabetes, cardiovascular disease, and certain forms of cancer and respiratory diseases.^[5, 6] Integrating oral health promotion strategies and programmes with broader programmes in preventing and controlling NCDs can lead to better health outcomes.^[7] Therefore, collaborating and networking with other health care professionals is essential for dental personnel, and should begin in their training to develop the skills of collaborative practice and holistic patient management. Moreover, South Africa, specifically KwaZulu-Natal province, has a considerable burden of disease including oral conditions, which impacts on the under resourced health system.^[8]

The University of KwaZulu-Natal is responsible for training health professionals in the province and contributes significantly to a workforce that meets the health care needs of communities. This is ensured by producing graduates with the key competencies of being compassionate health care workers who communicate well with patients from various cultural backgrounds, collaborate with other health professionals in patient management, and are leaders as agents of change. Undergraduate student health professionals from multiple disciplines can improve the health outcomes of communities through contextualised health promotion initiatives by collaborating with each other in an interprofessional team approach. The Discipline of Dentistry, within the School of Health Sciences in UKZN, offers a three year degree in Dental therapy and a two year Diploma in Oral Hygiene which is currently being replaced with a three year Degree in Oral Hygiene. The scope of practice for a dental therapist is preventive and curative oral health care through various procedures, such as dental examinations, diagnosis of common oral diseases, scaling and polishing, placement of direct restorations and tooth extractions. The dental therapist is well suited to meet the oral health needs of the population in both public and private sectors in urban and rural communities. In the public sector, the dental therapist can contribute significantly to improved oral health care in primary health care settings through oral health education, promotion and managing oral diseases. By collaborating with other health professionals, they can contribute to improved

overall health outcomes of communities through joint oral health and health education and promotion, referrals, treatment requests, precautions and early detection of oral and systemic diseases. ^[4] This collaboration needs to be fostered while the dental therapy student is in training, emphasising the need for IPE. This study aims to explore opportunities for dental therapy students' participation in collaborative interprofessional, community-based initiatives within the School of Health Sciences.

Methods

Research setting and context

The College of Health Sciences at UKZN has four schools; Clinical Medicine, Laboratory Medicine and Medical Sciences, Health Sciences and Nursing and Public Health. The School of Health Sciences consists of eight disciplines; Audiology, Biokinetics, Exercise and Leisure Sciences, Dentistry, Occupational Therapy, Optometry, Pharmaceutical Sciences, Physiotherapy and Speech-Language Pathology. Clinical training in these disciplines occur at campus clinics and designated off-campus sites, such as the Oral and Dental training site situated in a local hospital. Community-based education (CBE) at undergraduate level is a prominent feature across all disciplines, although the levels of participation differs. CBE activities include health awareness programs, screenings and service delivery under supervision at local primary health care centres and hospitals as well as clinical training at decentralised training sites such as regional and district hospitals. At the decentralised sites, students have an extended stay, providing a continuum of care to patients over a period of two to six weeks depending on the requirements of each discipline. Interprofessional community-based activities occur through collaboration of a few disciplines, but have excluded the Discipline of Dentistry.

Research design

This was a qualitative explorative study in which opportunities for interprofessional community-based initiatives for dental therapy students in the School of Health Sciences were explored by engaging with academics involved with CBE. This study was part of a larger research project conducted on community-based education in the School of Health Sciences. Ethical approval was obtained from the Humanities and Social Sciences Research Committee, UKZN (HSS/1060/015D).

Participants

The researcher used a purposive sampling method to select the study sample, who were selected for their expert opinion. They included the College Dean of Teaching and Learning, the School's Academic Leader of Teaching and Learning, an academic from Family Medicine/Rural Medicine who is involved in community-based training of medical students, and an academic from the Discipline of Dentistry, who is the Head of the Professional Board for Dental Therapists and Oral Hygienists in the Health Professionals Council of South Africa (HPSCA). An invitational e-mail was sent to each person to request their participation in the study, to which they all agreed to participate. In addition, e-mails were sent to the academic leaders of each of the Health Sciences programmes to nominate one academic currently involved with CBE to participate in a focus group discussion. Individual invitational interviews were sent to eight academics, which resulted in a total of twelve respondents (A1-A12) agreeing to participate (Table 1) who all provided written informed consent.

Table 1. Study population

Participant	Role in academia	Methods
A1	Dean of Teaching and Learning in College	Interview
A2	Academic Leader of Teaching and Learning in School	Interview
A3	Academic from Family Medicine	Interview
A4	HPSCA representative	Interview
A5-A12	Focus group participants from School of Health Sciences	Two focus groups

Data collection

The data was collected using both face-to-face individual interviews, lasting approximately 30 minutes, and focus group discussions. The researcher conducted interviews with the Dean and Academic Leader to gain a deeper understanding of how interprofessional CBE could be implemented within the school using a set of mainly open-ended questions to elicit qualitative information. The questions related to the policies and procedures for implementing interprofessional CBE, associated support and mechanisms and funding for interprofessional projects. An interview was held with an academic from Family Medicine to learn how CBE was conducted in other schools within the College of Health Sciences. The researcher conducted the final interview with the academic who heads the Professional Board for Dental

Therapy and Oral Hygiene on the HPCSA to gain insight into their guidelines regarding interprofessional training for dental therapy. A total of four interviews were undertaken and were scheduled at the interviewees' convenience, each lasting approximately 30 minutes.

In addition, the researcher facilitated two focus group discussions with the academics representing each of the eight disciplines, with four participants in each group as all academics could not avail themselves at once. The researcher developed a set of questions to guide the focus group discussions which focussed on their views regarding interprofessional CBE. Sample questions included: what are some of the interdisciplinary collaborative activities that you are aware of, that are being conducted within the School of Health Sciences? What are the opportunities for dental therapy students working collaboratively with other student health professionals to enhance student training within the school? What are the possible barriers perceived for this collaboration?

The interviews and focus group discussions were audio-taped, which a research assistant transcribed verbatim and then cleaned. The researcher engaged the services of a research consultant to assist with the data analysis process. Data coding was done by both the researcher and the research consultant to identify particular features of the data, which was then sorted, allowing themes and sub-themes to emerge from the respondents' statements, according to Braun and Clarke's guide to thematic analysis.^[9]

Credibility is a form of internal validity in qualitative research that establishes whether the research findings are genuine and are indeed a true reflection of the participants' original views (Lincoln & Guba, 1985).^[10] In this study, credibility was established through the use of varied research methods, namely interviews and focus group discussions to collect the data; three of the interviewees (A1, A2 & A3) being asked the same questions, while A4 was asked about the HPCSA guidelines and A5-A12 were asked questions about opportunities for collaboration and possible barriers. Credibility was further established through peer debriefing which was undertaken by another member of the research team who reviewed the data collection methods and processes, transcripts and data analysis procedures, and provided guidance to enhance the quality of the research findings (Guba, 1981).^[10]

Transferability relates to external validity in qualitative research, which determines the degree to which the research findings can be transferred to other contexts and other respondents. (Bitsch, 2005).^[10] This was facilitated through the use of a purposively selected sample and

providing a thick description of the context of the enquiry (Guba, 1981).^[10] Transferability was further enhanced by comparing the research findings with current literature. Dependability is used to determine whether the same research findings would be achieved consistently if the same participants had been used in the same context (Bitsch, 2005).^[10] This was achieved through use of member checks, where the analysed data was sent to a few participants to evaluate the interpretations made by the researcher. Dependability was further enhanced by both the researcher and the research consultant as a co-coder analysing the same data and comparing the results. Confirmability is establishing if the findings are derived from data coming solely from participants and not just made up by the researcher (Tobin & Begley, 2004: p 392).^[10] This was established through quotations of actual dialogue of the interviewees. Participant confidentiality and anonymity were maintained through the use of codenames to protect the identity of each participant (A1-A12).

Results

Based on the responses of the interviews and focus group discussions, four main themes emerged from the data analysis process; implementing IPE, benefits of IPE, opportunities for dental therapy students' participation and barriers to implementation.

Theme 1: Implementing IPE

Under this theme, three issues arose; the need for IPE, How IPE should be implemented? and When IPE should be implemented?

The need for IPE implementation

The focus group participants reported that they only knew of one interprofessional collaboration within the school that involved Occupational Therapy, Audiology, Speech-Language Pathology, Physiotherapy and Biokinetics. This project was initiated through collaboration of academics from the respective disciplines. Given this context, all respondents agreed that there was a definite need for interdisciplinary education in the school (Table 2).

Table 2: Need for IPE in the School of Health Sciences

Sub-themes arising	Participants' responses
Inclusive planning for service based learning	'I think that there is a need for a definite school strategy to come to the fore' (A2)

Student training aligned to graduate competency	‘If we want to work in inter, multi or trans-disciplinary teams later, we need to train in that, you need to have experiences as part of your training as how you work so you get the skills.’ (A3)
Learning is contextualised in real world settings	‘There is a demand out there and sometimes you are left alone to manage an array of conditions of patients and sometimes there is no occupational therapists for instance. I feel we need to do enough to be able to do the basics or refer at the right point in time.’ (A11)

How IPE should be implemented?

Respondents had interesting ideas on how to implement IPE as illustrated by the following quotes (Table 3).

Table 3: Participants’ views on how implementation should occur

Ideas	Participants’ responses
Integration into existing timetables	‘I think in health sciences it is very easy to integrate it because we already do clinical placements in all of our programs. It is not like we have to go and reinvent, getting placements fitting it into the timetable, the structure is there we basically have it.’ (A1)
Mobile services	‘The ideal would be to have a mobile clinic or a clinic unit where students are actually able to rotate with the patient. The patient walks in, is assessed in an assessment room by a number of practitioners at the same time, so you will have for example your speech and hearing person, eye specialists, your dental person all assessing the patient in the presence of each other and thereafter referring the patient to the specialist discipline that the patient requires.’ (A4)
Interdisciplinary service delivery on campus	‘Having an interdisciplinary clinic on campus. We can have a clinic where we all have sessions on a Friday from 8 to 1 where each discipline is represented. A patient can go through a system having being exposed to the different disciplines in one health care setting. That becomes our own campus training model and when they go out there they know how to work together.’ (A9)

When IPE should be implemented?

The academics believed that IPE should have a strategic entry point, as illustrated by the following quote:

‘I think level one; if you do it as early as possible then students get to know and to learn.’ (A2)

Theme 2: Benefits of IPE

Respondents from the focus group recognised the value of different disciplines working together. Academics believed that IPE not only exposes students to knowledge and skills of their own profession but that of others, and that by understanding the scope of practice of other professionals, they could learn to refer patients appropriately in the future (Table 4).

Table 4: Benefits of IPE

Benefits arising	Participants’ responses
Peer assisted learning	‘The students learn so much from each other, about each other and about the professions and that is a model for how they are going to be working out there.’ (A5) ‘Sharing of knowledge and skills and also they start to treat the patients as a whole, not in parts.’ (A6)
Knowledge of referral patterns	‘...students are aware of the capabilities of the tasks of the scopes of practice of other types of practitioners so that they are able to refer patients and that actually leads to the holistic treatment of patients.’ (A4)
Access to health care	‘It will contribute immensely to community upliftment-this will improve access to different aspects of health care that they were not introduced to previously.’ (A8)
Acquisition of non-technical skills	‘Sharing of resources.’ (A6) ‘Problem solving is much better with the team.’ (A6)

Theme 3: Opportunities for dental therapy student participation in IPE

The respondents indicated that there were many opportunities for dental student participation in CBE projects, including integrating oral health into general health promotion strategies in schools and at primary health care centres (Table 5):

Table 5: Opportunities for dental therapy students

Sub-themes arising	Participants’ responses
Integrating oral health into general health	‘Oral health is really very well placed. It actually fits in very well with the primary health care, re-engineering primary health care and community based training because especially if it is primary care and

	preventative and promotion with the school health program, it actually fits in very well, so it resonates with the national health insurance.’(A1)
Joining existing CBE	‘Dental therapy can definitely play an important role as I have noticed a lot of children have dental problems, but we see you as a consultant for education events, not on an ongoing basis.’ (A8)
Student initiated IPE project	‘It allows for student networking - the students do the inviting - they are the agents of action - they analysed the need and approached the various disciplines to send their students.’ (A8)
Participation in school programs	The school based team, the dental therapy students could easily come in really effectively with the speech and audio students. It is about looking at where we can come together.’(A5) ‘Going to a school, working with younger kids and saying we are looking at screening, we can do vision, oral and eye maintenance together. We can look at what services are needed and then manage it so it does not become too overwhelming for patients. If we had projects like this it would be really good.’ We could also educate teachers on how to pick up on hearing loss and tooth problems.’ (A6)
Health education and promotion activities	‘The clinic sites that we go to, we can go into the queues, while the moms are there for the immunization for their babies, go through the the risk factors, we give them pamphlets. You could do that in their space. It is a captive audience there basically they do not want to leave the queues to come for the actual testing. We say to students they make these huge posters and they go and stand in the front, while you are waiting, nobody has to move.’ (A6).
Part of a rehabilitation team	‘They also have support groups and they put people together either with different disabilities or stroke groups. So it is beyond the prevention and promotion it is also towards development, collaboration.’ (A6) ‘Rehab and long term, at the moment we are seeing a lot of stroke patients, there’s pooling of food, poor dentition, etc.so there is a role for dental therapy.’(A8)

Theme 4: Barriers to collaboration

Academics have noted a number of barriers to implementing IPE (Table 6):

Table 6: Barriers to collaboration

Themes arising	Participants’ responses
Silo teaching	‘There is no overall curriculum design that allows you to coordinate time when students are able to spend time together. Some disciplines have this block system of 2 weeks and others blocks of 5 weeks and other blocks of 6 weeks so the timing of us all going together to do activity, which would need to be continuous over time, does not fit into every curriculum.’ (A3)
Mismatch in student numbers	‘If we have 400 medical students and we want every single one of them to have a meaningful experience with a physio, OT, speech therapist, the dentist

	but you have only got 30 dental therapists. How do you match the numbers?’ (A3)
Non-compliance of staff	‘A lot of people are just happy to sit in their offices and keep doing what they have been doing for the past 15-20 years because they do not see the value. To them it is just a complication, everything is working. We have been doing it this way and it is working now why are you coming to change things?’ (A9)
Lack of academic transformation	‘It is like you want to protect your own territory, you do not realize you can learn from each other and that there is so much growth. We need to transform... it has been a culture of this university that everybody stays in their silos, we need to start working together. (A11)
Insufficient support for collaborative practice	‘Funding and support from administration and leadership’ (A10) ‘Space on buses as various disciplines share the same bus.’ (A8) ‘The thing to consider now with the bigger student numbers is when we all descend on one place with multiple disciplines, is the physical spaces.’ (A5)
Community acceptance	‘Suddenly they see this team working but they are used to seeing the doctor on their own. It causes a lot of mistrust.’ (A6)

Discussion

This section discusses the findings for each of the four themes: implementing IPE, benefits of collaboration, opportunities for dental therapy students’ participation and barriers to collaboration.

Theme 1: Implementing IPE

Given the context of producing more socially accountable and relevant health care workers, the participants indicated their support for disciplines to create interprofessional learning opportunities for students. The experience of working together with other student health professionals while in training will prepare them for more effective collaborative practice in response to health needs when they graduate. Such initiatives are expected to be driven by interested academics from various disciplines, with no formal mandates within the School to ensure that this takes place as a learning opportunity. The current IPE project was initiated by lecturers who are drivers in their disciplines, being motivated to transform health professionals’ education and ensuring that their students are equipped for various work environments. These lecturers serve as bottom-up drivers for change, having identified a need to make their teaching relevant, which must be noted by management structures that give direction to preparing the School’s graduates. Drivers can either be top-down or bottom-up. ^[11] Top-down drivers refer to people with the highest rank in an organizational structure directing the change. This includes leaders at universities such as Deans. Bottom-up drivers are interested academics from

across multiple disciplines engaged in co-operative creating, planning and implementation to bring about transformation. ^[11] From the reviewed literature, Treadwell also noted that in the absence of top-down drivers for implementation of IPE, lecturers interested in transforming health professional education must serve as bottom-up drivers for change. ^[12] Moreover, documented examples exist where students have identified the need to create collaborative interprofessional learning environments for health professional students, having recognized that this was lacking in their education. ^[13]

The study showed that academics had a number of ideas of how IPE could be implemented in the school, one being to integrate IPE into the current curriculum and time-tables. However, integrating IPE into an existing curriculum can be challenging with the selection of disciplines to collaborate with, being a complex process. ^[12] Purden in Treadwell noted the complexities of such initiatives and advocates the collaboration of not more than four disciplines. ^[12]

Academics believed that IPE should be implemented early in the academic program. This is being supported by VanderWielden who supports exposing students early in their education and training, as it offers increased opportunities for student interaction and collaboration with other emerging health professionals. Its early introduction was recommended as it takes a long time to develop the skills and professional competence and to know how to work with each other and the benefits from a team approach. ^[14]

Theme 2: Benefits of collaboration

The respondents reported that there were many advantages to IPE, including that it exposes students to not only knowledge and skills of their own profession but that of other professions. Respondents believed that this fosters mutual respect, trust and appreciation for other health professionals and reduces stereotyping and assumptions of the others' roles. The benefits of IPE are well documented in literature, such as creating learning opportunities for student health professionals to acquire non-technical skills, teamwork, leadership and social accountability. ^[12,13,14] Other benefits include ensuring continuous, reliable and integrated care for patients. ^[13]

Theme 3: Opportunities for dental therapy students' participation

According to the academics in the study, there are many IPE opportunities for dental therapy students. Those involved in the existing interprofessional project were willing to allow dental therapy students to join their project for health education activities who can contribute significantly in terms of oral health education for children in the community as well as offer

preventive measures such as fissure sealants and tooth brushing programs. This can be seen as an opportunity to screen children with dental problems, offer advice and refer to the nearest clinic for management of serious oral conditions.

In situations where ‘students are doing the inviting’, dental therapy students could become proactive and liaise with students involved with this project with whom they think a project can be done with, and also become ‘agents of action’. This is supported by literature which draws attention to student-led IPE programs among student health professionals in the United States where they recognized interprofessional training as a valuable, but lacking, learning strategy in their education.^[14] This would foster networking which is a key component of interprofessional collaboration and develop relationships that could benefit current education and future patient care.^[14] The literature shows that because oral diseases and other non-communicable diseases share common risk factors, integrating oral health promotion strategies and programmes with programmes in the prevention and control of NCDs can lead to better health outcomes.^[15] This can be implemented using the settings approach.

Settings Approach

The settings approach used in health promotion initiatives creates opportunities to address relevant health issues in contexts in which people live, work and play.^[16] This approach is widely advocated and yields considerable success, as it organizes health promotion interventions to target specific health problems relevant to specific communities.^[16] In this study, the respondents agreed that this approach can be used for collaborative initiatives, and identified two settings; the school and primary health care setting.

School setting

The academics in the focus groups suggested that dental therapy students could fit into an interprofessional team that can go to schools where joint oral health and health education, health promotion and screenings could be conducted. Such activities conducted in the school setting have been identified as the most creative and cost-effective way for improving health, oral health and quality of life.^[16] Reddy noted an increased awareness among learners and educators on the importance of daily tooth brushing and adopting the correct tooth brushing techniques following oral health education interventions conducted in schools especially in rural areas.^[17] It was further noted that following oral health promotion interventions, learners realised the importance of correct eating habits that can inform their choice of purchases from tuck shops and vendors.^[17]

Primary Health Care Settings

Academics cited primary health care settings as another opportunity for interprofessional collaboration for combined oral health and health promotion initiatives. This could take the form of health educational talks, as suggested by academics, while patients are waiting to be treated. By dental therapy students working together with other health professional students, it would foster the integration of oral health into general health more effectively and improve oral health care in communities.^[18] From the literature, Treadwell noted that setting the scene and creating the situation is crucial in the actual learning that takes place.^[12] Thus, by using the settings approach, students would be exposed to real-world settings in which they learn to contextualize, design and implement promotion inventions within resource and funding constraints, this being different from when they will do so at the ideal training sites of their institution.

Team approach for rehabilitation

Besides collaborating for prevention and promotion activities, opportunities also exist for dental therapy students to participate collaboratively with other health professional students in the rehabilitation of patients with physical disabilities and stroke patients. A stroke can have major effects on oral and facial soft tissues, and can affect simple oral functions such as chewing, drinking and swallowing.^[19] In addition, moving the tongue towards the affected side results in food pooling in that side of the mouth and reduces oral clearance, which increases the risk of dental caries, periodontal diseases and halitosis.^[19] Moreover, medications used to treat stroke patients can result in xerostomia (dry mouth) which further increases the risk of dental caries.^[20] Oral health care is therefore important for stroke patients and is often overlooked during the rehabilitation phase. The team that manages a stroke patient usually consists of physiotherapists, occupational therapists, and speech language therapists, with dental personnel not being included. In order for changes to occur in the workplace regarding professional collaborations, transformation must occur at the level of training. Student health professionals from these disciplines, together with dental therapy students should be given learning opportunities to work together in the rehabilitation of stroke patient. This could lead to better health outcomes for the patient as well as the inclusion of dental therapists in the rehabilitation team.

In a systematic review of strategies used for IPE activities, it was observed that the most common strategy used by universities were small group discussions, followed by case or

problem based learning, clinical teaching or direct interaction with patients, simulations, community-based education projects and e-learning. ^[21] It is clear from the focus group discussion that there are diverse interprofessional learning opportunities for dental therapy students. These opportunities include joint oral health education and promotion activities, screening programs, diagnosis and referral of patients as well as in rehabilitating of patients with stroke and physical disabilities. These opportunities resonate with the principles of Primary Health Care (PHC) namely prevention, promotion, curative care and rehabilitation, thus establishing a link between IPE and PHC and provides the most appropriate mode for facilitating IPE for dental therapy students.

Theme 4: Barriers to IPE

The main barriers identified in this study were finding a common time for the disciplines to participate in IPE activities, matching the numbers of students and staff participation. Abu-Rish in a systematic review of IPE also reported similar barriers among 65 studies, such as scheduling a common time for IPE implementation, difficulty in matching numbers of students with similar backgrounds, skills and levels of clinical knowledge, funding and staff and leadership buy-in. ^[21] To overcome some of the barriers experienced at this university, the academics made the following recommendations:

‘We can start by aligning the sites, opening up communication and start talking to each other.’ (A11)

‘There is huge opportunity to sit and develop either a common module or say these are going to be the common times for all of us even if you keep your own separate modules.’ (A5)

‘You need a phased in approach to implement such a program. Just getting the buy in from everybody that will be involved at every stage in the academic progress.’ (A11)

‘We should bring innovation and change and ourselves be trained in the very same field. We do not know it at all so we should be open to get more knowledge about what is happening elsewhere.’ (A10)

Getting the co-operation of staff is challenging, however, Treadwell recommended that staff engage in collaborative discussion to develop a shared understanding of the purpose and goal of IPE to bring about change in thinking and acceptance. ^[12]

The way forward

The study findings indicated that dental therapy students are well suited to collaborate with those from the other disciplines. The IPE strategy best suited for their inclusion being

community-based health prevention and promotion interventions, as oral health is related to general health and wellbeing. As a suggestion, it would be better to start a collaboration with one other discipline initially, by integrating oral health promotion into general health promotion programs, which can be presented together at primary health care settings or school settings. Once the logistics have been addressed, other disciplines can be incorporated, depending on how the dental therapy student participation can integrate with their curricula and clinical placements.

Most of the disciplines in the Schools of Health Sciences send students to decentralized sites for work experience, which is an untapped opportunity for student health professionals to engage with each other, network, collaborate and conduct contextualized health promotion interventions to patients throughout the hospital while patients are waiting to be attended to. A program can be devised whereby the students can start off their day by working collaboratively, after which they work in their respective departments to attend to their patients.

IPE is an effective pedagogical approach that allows health professional students to have a better understanding of the roles of other professions and gain collaborative skills. ^[12] Universities have an important role in creating such learning opportunities, its implementation requiring motivated drivers who can initiate this process of transformation. In this study, it was noted that academics from the various disciplines were the drivers in creating and implementing IPE interventions. Academics should embrace this opportunity to meet, collaborate and plan IPE activities for student health professionals. However, successful implementation requires more than just drivers, it requires supportive leadership, committed academics and student compliance.

Limitations of the Study

It is acknowledged that this study was limited to only one university making the findings and its context limited in their generalizability. More research is therefore required at other universities in South Africa that train dentistry, dental therapy and oral hygiene students to obtain a better understanding of how IPE opportunities could be created and incorporated into their programs.

Conclusion

The study findings revealed that opportunities do exist for interprofessional community-based education for dental therapy students. Using the settings approach, the students from the

Discipline of Dentistry, in collaboration with other student health professionals, can conduct health promotion interventions contextualized for specific communities, depending on the need and available resources, at school, primary health care and other community-based settings. Using a team approach, they can be included in student health care teams that are involved with screening, diagnosis, and referral systems, as well as in rehabilitating patients. However, the creation of interprofessional interventions require individual lecturers as drivers from the various disciplines in consultation with each other, with the support from programme managers to support curriculum changes and resource allocations. To ensure that the students are equipped to participate in team collaborations once they enter the work environment, the School also needs to support and motivate for such collaborations.

Author contribution

I. Moodley¹ was responsible for data collection, data analysis and conceptualisation.
S. Singh² was responsible for refining the methodology and overseeing the write-up.

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5.3 Manuscript 3

The role of assessment in community-based education for undergraduate Health Sciences students

This study explored the role and context of assessment in community-based education by ensuring that the methods used by academics were fair and appropriate for community-based practice.

This study linked to objective one which was to determine the intended role of community-based clinical training and within this context, assessment was an important aspect, determining the effectiveness of community-based learning opportunities. It also linked to objective two, (to explore opportunities for interdisciplinary community driven initiatives for dental therapy students) as it explored how assessment can be conducted using an interdisciplinary approach.

The main findings of this study indicated that a wide variety of assessment methods were used by academics ranging from simple to complex methods. It was further noted that multiple assessments were required to achieve the learning outcomes of CBE.

The role of assessment in community-based education for undergraduate Health Sciences students

Abstract

Background. Community-based education (CBE) is an empirical education experience that shifts clinical education from traditional to community settings to provide Health Sciences students with meaningful learning opportunities. However, assessing the effectiveness of these learning opportunities is a challenge.

Objectives. The study aimed to determine the role of assessment in CBE by describing the methods used for assessments by the various disciplines within the School of Health Sciences, University of KwaZulu-Natal, and to determine how they were aligned to the anticipated learning outcomes.

Methods. This qualitative study consisted of a purposively selected sample of academics who participated in audio-taped interviews and focus group discussions with the data being thematically analysed. Ethical approval was obtained from UKZN.

Results. The disciplines within the School of Health Sciences used various assessment methods ranging from simple tests, assignments and case presentations, to more complex clinical assessments, blogging and portfolio assessments. Multiple methods were required to meet the anticipated learning outcomes of CBE, as one single assessment would not achieve this.

Conclusion. The study findings indicated that assessment plays an important role in consolidating student learning at CBE sites, with multiple assessment methods being required to achieve graduate competencies in preparation for the workplace. Choice of assessments methods must be contextual and fit for purpose to allow for overall student development.

Keywords: community-based settings, assessments, health sciences, UKZN

Introduction

Community-based education (CBE) is an empirical learning experience that shifts clinical education from traditional to community settings to provide students with meaningful opportunities for self-development, improving their clinical skills, problem solving and life-long learning (Deogade & Naitam, 2016; Mabuza & Diab, 2013; Bean, 2011). For Health Sciences students, they are exposed to real life situations that can contribute to a deeper understanding of social determinants of health and various cultures, improved communication skills and a more positive, compassionate attitude towards patients (Mofidi, Strauss R & Pitner, 2003).

The University of KwaZulu-Natal, in its effort to be more community engaged, strives to transform health professionals' education from a traditional structure to more competency based that adds value to the communities it serves. The School of Health Sciences drives this agenda through embracing community-based clinical training in all disciplines, including Audiology, Biokinetics, Exercise and Leisure Sciences, Dentistry, Occupational Therapy, Optometry, Pharmaceutical Sciences, Physiotherapy and Speech-Language Pathology. Clinical training in these disciplines occur at campus clinics and designated off-campus sites (Essack, 2014). Community-based clinical training is currently being undertaken at various sites such as primary and community health care centres and decentralised sites including regional and district hospitals. At the decentralised sites, students have an extended clinical exposure for a period of two to six weeks, depending on discipline specific requirements for clinical training. The University provides support for this type of training by ensuring transport to these sites and accommodation for students. Academics prepare students for the decentralised sites by ensuring that they have attained an adequate level of competency in terms of clinical exposure and theoretical knowledge, before they depart. Clinical staff at the decentralised sites are

responsible for monitoring and supervising students on a daily basis, as an informal part of their jobs.

The main outcomes of CBE are to provide students with clinical skills in primary health care and to equip them with graduate competencies (Table 1) to be an empathic health care practitioner, communicator, collaborator, leader and manager, health advocate, scholar and professional, able to function effectively in a variety of health and social contexts, as noted in the institution's Business Plan (Essack, 2014).

Table1: Graduate Competencies for student health professionals at UKZN

Role	Criteria
Health care practitioner	able to provide optimal, compassionate and culturally sensitive patient care using primary health care principles; adapt to working in a community setting; use critical thinking in managing complex care situations.
Communicator	able to communicate with patients from different cultural backgrounds; develop trusting and ethical relationships with patients.
Collaborator	able to participate effectively in an interdisciplinary team; recognise and respect the roles, responsibilities and competencies of other team members.
Leader and Manager	able to identify the socio-economic, demographic, cultural and environmental factors that affect the health of this community. Skills in understanding how the health system operates at different levels.
Health Advocator	able to identify the health needs of individual patients taking their culture into consideration; advocate for patients with particular health needs(including the poor and marginalised members of society)
Scholar	able to reflect on one's strengths and limitations of knowledge and skills; enhance professional skills and lifelong learning.
Professional	able to display professional behaviour, commitment, respect, empathy, altruism, beneficence and no maleficence when treating patients.

Source: (Health Professions Council of South Africa, 2014)

A key component of CBE is reflection on learning, which facilitates the connection between practice and theory, thought and action, and fosters critical thinking (Deogade & Naitam, 2016; Holland, 2006). From the literature, two main theories explain how learning occurs in a community environment: Kolb's Experiential Learning Theory (Kolb, 1984) in which students learn through observation, experience and reflection, and Lave and Wegner's Situated Theory in which learning is embedded in activity, context and culture (Lave &Wegner, 1990; Kelly, Walters & Rosenthal, 2014)

While students are at a distant learning site, academics need to determine if learning does in fact occur, and if the community-based program has achieved the intended outcome, thus making its assessment important. Assessment drives learning (Wormald, Schoeman &

Somasunderman, 2009) and inspires students to set higher standards for themselves (Epstein, 2007). The main reasons for assessments in Health Sciences education is to optimise student capabilities and protect the public against incompetent clinicians (Epstein, 2007). Assessments should therefore test knowledge, technical skills, clinical reasoning, professionalism, communication skills and reflection (Epstein, 2007). To do this, Bloom (1956) proposed a model for written assessments, starting with testing lower order thinking levels of remembering, understanding and applying, to higher order thinking levels of analysing, evaluating and creating (Bloom, 1956, Figure 1). Similarly, Miller (1990) proposed a model to assess clinical competence, starting with cognition testing knowledge (knows), competence (knows how), performance (shows how), and action (does) (Miller, 1990, Figure 2).

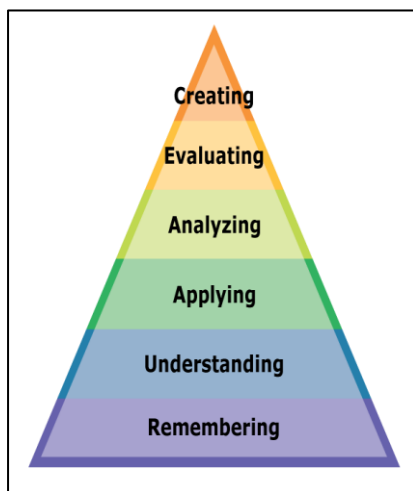


Figure 1: Revised Bloom's Taxonomy
<http://www.learnnc.org>. Accessed 08 March 2017

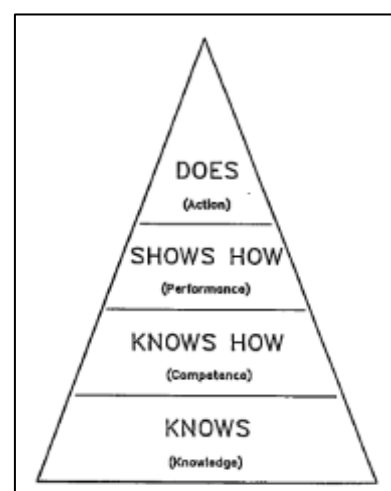


Figure 2: Miller's pyramid framework for clinical assessment (*adapted from Miller GE. "The assessment of clinical skills/competence/performance."*)

The literature indicates that there is a trend toward continuous assessment in the form of small formative evaluations throughout the year rather than a single summative one at the end of the year (Ferris & O'Flynn, 2015). However, designing assessments in CBE settings may prove challenging for several reasons: the learning environments are not standardised, making it difficult to control (Magzoub & Schmidt, 2000), and students are assessed by a number of tutors with varied levels of educational skills (Kaye, Muhwezi & Kasozi, 2011). Moreover, it can be a challenge assessing learning experiences that do not require memorizing facts (Cameron, 2000). Personal growth, change in attitude toward others with greater needs are also hard to measure. In addition, the principles of assessment must be followed when deciding on which methods to use, these being that assessments should be valid (measuring what is intended to

measure), reliable (consistency in marks obtained by several examiners), transparent (able to match the learning outcomes) and authentic (student's original work - no signs of plagiarism). Appropriate assessments are therefore required to measure both clinical skills and personal attributes that are truly reflective of the social context of the learning experience. Disciplines within the School of Health Sciences conduct CBE individually and collaboratively, with the level of implementation and assessment differing. Little is known about the assessment of CBE and, how the assessments evaluate the extent to which learning outcomes have been achieved. The aim of this study was therefore to determine the role of assessment in CBE conducted on undergraduate students in the School of Health Sciences at UKZN.

Methods

Research design

This was a qualitative, descriptive and explorative study to determine the role of assessment in CBE by describing the methods used for assessing CBE and exploring the extent to which each method achieves its learning outcomes. This study was part of a larger study conducted on CBE in the School of Health Sciences, UKZN. Ethical approval was obtained from the Humanities and Social Sciences Research Committee, UKZN (HSS/1060/015D).

Participants

The researcher used a purposive sampling method to select the study sample, who were selected for their expert opinion, and included the School's Academic Leader of Teaching and Learning for an interview. An e-mail was sent to the academic leader of each of the eight Health Sciences disciplines to nominate one academic currently involved with CBE. Invitations were sent to the nine identified academics, with all (A1-A9) agreeing to participate, and providing written informed consent.

Data collection

The data was collected using two methods, a semi-structured interview and focus group discussions. The face-to-face interview with the School's Academic Leader of Teaching and Learning, lasted approximately 30 minutes, and was intended to determine the role of assessment in CBE using mainly open-ended questions. Sample questions included: What is the role of assessment in community-based teaching? Who should be involved with assessment?

The researcher also facilitated two focus group discussions with the academics representing each of the eight disciplines, with four participants in each group. The researcher developed a set of questions to guide the focus group discussions that focussed on their current CBE projects and the role of assessment. Sample questions included: what are your views on assessing community-based training? Can you suggest appropriate methods of assessing community-based training?

The interview and focus group discussions were recorded, which a research assistant transcribed verbatim, after which the data was cleaned before analysis. The researcher engaged the services of a research consultant to assist with the thematic data analysis process. Data coding was conducted by the researcher and the consultant to identify particular features of the data, which were then sorted, allowing themes and sub-themes to emerge from the respondents' statements according to Braun and Clarke's guide to thematic analysis. (Braun & Clark, 2010) In addition, the researcher conducted a review of the assessment methods, using an inductive analysis process and tabling the results.

Credibility, a form of internal validity in qualitative research, was established through use of varied research methods, namely interviews and focus group discussions, to obtain the data. This was also done through peer debriefing, which was undertaken by another member of the research team who reviewed the data collection methods and processes, transcripts and data analysis procedures, and provided guidance to enhance the quality of the research findings (Pitney & Parker, 2009). Transferability, which relates to external validity, was facilitated through the use of a purposively selected sample, and thereby providing a thick description of the context of the enquiry (Bitsch, 2005). This aspect was further enhanced by comparing research findings with the current literature. Dependability, which determines consistency in research findings of the same participants and context, was achieved through use of member checks, where the analysed data was sent to a few participants to evaluate the interpretations made by the researcher (Bitsch, 2005). Dependability was further enhanced by both the researcher and the research consultant as a co-coder analysing the same data and comparing the results. Confirmability was established through quotations of actual dialogue of the respondents. Participant confidentiality and anonymity were maintained.

Results and Discussion

Based on the responses of the interviews and focus group discussions, two main themes emerged regarding the role of assessment in CBE: the assessment process and the methods of assessment used. In addition, a review of assessment methods used is given and discussed.

Theme 1: The assessment process

Under this theme, three sub-themes arose: the relevance of assessments in CBE, who should perform the assessment and how assessments should be done.

1.1 The relevance of assessments in CBE

All respondents in this study agreed that assessment was an integral part of CBE to ensure that students pay attention, as indicated by the following quotes.

'Yes, definitely ...assessment and education for me goes hand in hand. I cannot split the two.'
(A1) *'...There is no student who will take the training seriously if they know that there is no sort of assessment.'* (A7)

Assessments were considered important for both the learner and the academic as it drives the students, and motivates and directs future learning to incrementally improve their capabilities from a student to a graduate to a health professional (Epstein, 2007). In this way, it inculcates a habit for self-reflection that contributes to life-long learning. For the academic, it serves as a means of determining whether a student can progress to the next level and exit the programme with key professional competencies and relevant technical and non-technical skills in communication, collaboration, scholarship, leadership and advocacy (Essack, 2014). While it is important to send students to community-based settings to provide learning opportunities to achieve such competencies, it is also important to gage the level of competency attained at these sites, making CBE assessment essential.

1.2 Who should perform the assessment?

The academics raised concerns about who should be conducting assessments, as the competence of clinical supervisors varied among the programmes, as did the participation of academics at such learning sites. Participants were concerned about who would conduct the assessments, as academics are generally responsible for the course content and to ensure that skills are transferred.

'Now with the shift towards decentralised training because it is going to be community based, my problem is our students are going to go to these complexes that are further away from us. Who is responsible for the assessment? What framework or tools are available? The way we assess right now is a very objective assessment but are the people who are supervising our students equipped to use that assessment tool?'(A8)

While some respondents believed that both academic staff and clinical supervisors should be equally involved with assessment, given their differing roles in imparting knowledge and skills, others believed that clinical staff could be empowered, through training to assess students as illustrated by the following quotes.

'It will have to be both because you need the academic side of it as you know about the assessment, you understand it better, how assessment works. The clinical supervisor has not been trained formally in assessment, but from their experience, they can be roped in. They cannot assess a student only, but you need them as well, because they have worked with the student. So ... we need to get those people comfortable with assessing this student.' (A1)

'Can be done if staff at these sites are trained and willing to do it. However, they should be monitored by university staff.' (A4)

The academics have been responsible for assessments, with the literature indicating a change from single test methods to multisource assessments, including by clinical supervisors, peers and self (Ferris & O'Flynn, 2015). This is further supported by Doherty and Couper (2016), who views the clinical supervisor as a personal mentor and role model who contributes towards improving student clinical and communication skills. Clinical supervisors should thus be actively involved with assessment, but where they are unable to do so, they need to be mentored (Doherty & Couper, 2016). Students should also be given a chance to judge their own work and that of fellow students, as self-reflection and self-assessment ensures active engagement with theory and practice and a deeper learning experience that promotes lifelong learning (Ferris & O'Flynn, 2015).

1.3 How assessments should be done

Senior Management of Teaching and Learning believed that assessment should be formative (ongoing) rather than summative, which is currently what is taking place for many programmes.

'... there are very interesting ways of looking at assessment ... it must be continuous assessment. You cannot have your exams on something like this. It is continuous assessment where every step of the way a student is taught something, it is assessed if he knows it. If he does not know it, you go a step back and you teach him.' (A1)

In support of this, the literature indicates that formative assessment is the most appropriate way to assess CBE, as it guides future learning, promotes self-reflection and instils values (Epstein, 2007; Al-Wardy, 2010). Competence is developmental, as students start off as novice learners, only knowing theory, then progress to applying it in clinical situations. By engaging with

patients on repetitive rotations, they reflect and learn through trial and error to effectively manage patients in a professional manner (Epstein, 2007). Formative assessment thus aids in the progress of a student from novice to competent professional with feedback from assessors to guide the learning.

Theme 2: Methods of assessments

From the focus group discussion, it was established that only one of the eight disciplines had very limited participation in CBE with, no assessments being conducted. Academics in the other seven disciplines conducted their assessments using varied methods which included oral, written, clinical, on-line, peer and multiple modes as described below.

Oral assessment

The academics from seven disciplines used some form of oral assessment, which included seminars, case and handover presentations and oral examinations.

a. Seminars, case and handover presentations

Seminars were oral presentations on topics that are well researched and presented, using power-point, to an audience of peers and academics. Academics use this assessment to assess knowledge and communication skills. Case presentations were the most common method of oral assessment, as it enabled the academics to assess students' communication skills. Oral case presentations is the primary mode of communication between health care professionals and facilitation of efficient patient care (Green, Durning & DeCherrie, 2009). This assessments being conducted summatively at the end of the block at the clinical site by academics from individual disciplines, while others being assessed as a group by academics from the different disciplines, with written documentation to support the oral presentation, as illustrated by the quotes below.

'The whole team is expected to see one case- then all students across the professions present the case and each student is expected to present from their professional perspective and they each get a mark for this.' (A5)

'Handover presentation - where they talk about all the projects and all the clients they have seen and do a verbal presentation and also hand in a written doc which is e-filed and is stored as an information base for future rotations and they get a mark for this.' (A5)

The academics reflected that the main advantages of case presentations were team work and the promotion of interprofessional collaboration.

'We really grow them in those case presentations because they do it, they plan it collaboratively and they present it collaboratively and they do not necessarily present on the audio part, they may present on the OT part. It actually forces them to really understand to give value...' (A2)

However, they found that in group case presentations, weaker students might go undetected.

'The disadvantage of what we do at the moment with case presentations and handovers particularly, is that when they are doing group work we have very little opportunity to hone into the weak individual student until the exam, and a student can slide, based on competent group members who do not want their mark to be compromised. So, they will pick up the slacker, they will work harder to make sure this group gets a good mark.' (A2)

Green et al. (2009) noted that case presentations test a student's clinical reasoning, decision making and organisational skills, and establish their ability to determine what information is required for a good presentation (Green, Durning & DeCherrie, 2009). The added value of case presentations is that they are the most common mode of communication between professionals, and affords students the opportunities to learn and master this while in training. (Green, Durning & DeCherrie, 2009). However, ethical and moral principles around patient confidentiality may be compromised when clinical cases are presented in front of an audience of peers.

b. Oral examination

Some disciplines conducted an oral examination as it enabled assessment of knowledge and communications skills with the academics noting.

'We also have an individual oral exam which covers a lot of the theory behind their thinking about why they are doing it, what primary health care principles are evident in the program...'(A2)

Oral assessments test their knowledge and skills in communication, and as well as their ability to work with other health professional students, contributing towards graduate competencies in the roles of health care practitioner, communicator, collaborator, scholar and professional. In terms of Bloom's taxonomy, it tests the understanding of knowledge (Bloom, 1956), while in Miller's model of clinical competence, it tests competence (knows how) (Miller, 1990).

Oral examination, have been criticized in the literature for being unreliable and biased, with inconsistencies in questioning and marking (Gisselle O, Martin-Kneip, 2001). Moreover, students are tested under pressure within a limited time, which could be particularly difficult

for students if English is their second language. Questions have to be standardised, and as the exams are conducted one student at a time, this places the latter students at an advantage as they can be informed of the questions asked of the earlier students.

2.1 Written Assessments

This study showed that disciplines also used written assessments, to test knowledge and writing skills, such as assignments and essay writing and portfolios of evidence.

a. Assignments and essay writing

Some academics reported using assignments as an assessment method, with varying levels of success. Assignments test a student's ability to present a clear, concise summary of evidence of experiential learning.

'An assignment which is huge, some of them are 50 pages long which is submitted. Essays, too are used. A set topic is given to them and they have to submit, which asks them to unpack through theory what they are seeing and engaging with and to think things through using a very rich theoretical focus.' (A5)

Al-Wardy, (2010) affirmed that assignments and essays are good for processing, summarising and applying information to new situations (Al-Wardy, 2010). However, Epstein (2007) argued that written assessments had little value if they were not contextual, with clinical scenarios and questioning (Epstein, 2007). Written assessments rank low on Bloom's Taxonomy, as they test remembering, which is understanding of knowledge (Bloom, 1956), while in Miller's framework, it only tests cognition (knows) and competence (knows how) (Miller, 1990). In terms of graduate competencies, written assessment can contribute to developing the student in the roles of health care practitioner and scholar.

b. Portfolio of evidence

In this study, academics showed strong support for the use of portfolios as an effective means of assessing CBE, this being a compilation of work over time, and regarded by them as a good overview of a student's abilities.

'Students need to produce a portfolio of evidence of their experience of what they learnt at these sites, what were their weaknesses and strengths.' (A4)

'The best, the most efficient way of assessing is portfolio.' (A2)

Some argued that a disadvantage was that portfolios were time consuming to mark.

'The portfolio assessment, in itself is a nightmare in terms of managing it with the limited resources we have and the time as staff.' (A2)

A portfolio of evidence is a collection of a student's work that shows their effort, progress and achievement over time through self-reflection (Gisselle, Martin-kneip, 2006). The reviewed literature shows that portfolios are beneficial as it is an authentic way to assess a student's personal real-world experience of integrating learning of a wide range of personal, academic and professional development (Friedman, Davis, Harden, et al, 2001). It directs students to develop self-learning and autonomy, transferring responsibility for learning from the teacher to the student (Friedman, Davis, Harden, et al, 2001). Turnbull found it to be a reliable, valid and a feasible form of assessment (Turnbull, 2000). However, Al-Wardy, (2010) argued that it is not very practical as it was difficult for students to compile and time-consuming for academics to mark. As the case presentations, ethical issues around patient confidentiality may be a problem.

2.3 Clinical Assessment

This type of assessment involved assessment of a clinical procedure and log book entry.

a. Assessment of a clinical procedure

Three of the seven disciplines used this assessment which were conducted at the clinical sites by academics. This entailed direct observation of a student's interview with a new patient, performing patient history taking, diagnosing and treatment planning which was then presented, and performing a clinical procedure on a patient under observation by the lecturer, for which a mark was allocated.

'They get a clinical evaluation mark and that will be what the supervisor over the 6 weeks... There is a certain criteria they allocate. This makes up 50% of their clinical assessment mark and is based on what the supervisors are saying on a daily basis when they are out there. The other 50% comes from group work which is the case presentation.' (A2)

Assessment of a clinical procedure is the most common tool and is ranked high as it is a valid evaluation of clinical competence (Epstein, 2007). Such assessments prepare students with the

kind of experience necessary to manage patients on a day-to-day basis as future health professionals. It grooms a student to meet graduate competencies of being a caring health care professional and cross-culture communicator, as they provide detailed information of student and patient interaction to make a diagnosis and design a treatment plan in the patient's best interest. This kind of assessment also ranks high with Bloom's taxonomy (applying, analysing and creating) and Miller's framework (action/does). However, Al-Wardy, (2010) argued that clinical assessment cannot be very reliable because it lacks standardisation and there is a limited sampling of skills, as students are normally assessed on a single patient and may not perform their best on that given occasion.

b. Logbook entry

Academics reported also using logbooks to assess CBE, and provide students with a list of clinical procedures or tasks that must be completed, which the clinical staff must verify by signature that these tasks were adequately performed. It also documents the range of patient care and learning experiences undertaken by students as a means of self-reflection. Students also had an opportunity to comment on their own work, with the staff rating them according to level of competency.

'Daily assessments and entry into logbook at the site, which is marked by the clinical supervisors.'(A4)

According to Blake, (2001), keeping a logbook is very useful for focusing a student's attention in obtaining important objectives within a specific time period. This is a practical way of assessing a student at a decentralised site and to directly align their graduate competencies as health care practitioner, communicator, scholar and professional. However, for logbooks to be effective, it must use checklists or rating scales for assessing specific behaviours, actions and attitudes (Yang & Chang, 2012, Al-Wardy, 2010). This will also ensure standardisation of marks allocated by clinical supervisor and the academic.

2.4 On-line assessment

The advancement of information and communication technology has expanded the learning environment to allow students to learn anytime and anywhere, the Health Sciences academics having made use of the university's e-learning platform to assess their students. They indicated that it provided a communication platform for academics when students are at a decentralised learning site and promoted self-learning as students reflected on their work progress.

'They have got the weekly blog and before they go in ...they know in advance of some hours what they are going to be doing. They submit a plan at the beginning of the week that needs to be reviewed and that is assessed in terms of have they allocated enough time to do whatever they are doing and then from the blog we get a better idea of how the week went.' (A2)

'... that blog gives them a chance to reflect on their practice,... so you can see the learning and the growth and development and even in the exam they usually questioned about the blog and also to ensure that this is something they do as a lifelong practice, not just in this module.' (A3)

'Blogging- they need to blog every week. It is about writing and reflecting and thinking things through using Kolb's learning cycle during the blogs.'(A5)

Blogging is well documented in the literature as providing a rich situated learning environment that encourages knowledge creation, sharing of thoughts and opinions, creativity, interpretation of materials and reflection, which are more applied than the structured exercises in a classroom setting (Yang & Chang, 2012; Land, 2000). However Boulos, et al. noted that blogging does not support learning when used in an unplanned manner (Boulos, Maramba & Wheeler, 2006). While there may be many advantages to blogging, access to computers and internet may be a problem for students of UKZN as there may be limited resources at decentralised community-based sites. Blogging has the potential to mould a student into being a good health care practitioner, scholar and professional if it is used for knowledge generation and application. When used appropriately, it ranks high in Bloom's taxonomy, as it tests application and analysis of knowledge and in Miller's framework, it tests performance (shows how).

2.5 Peer assessment

The academics indicated that peer assessment was a useful tool to assess CBE as it enables students to evaluate their colleagues, alongside the academics, thereby ensuring fairness and consistency in assessment. It also encourages reflection by the students as they become more aware of how their work will be evaluated.

'We also have peer assessment on the last day, which is very strong, because when the students get their feedback they pull up their socks, I noticed that. They will say this person does not come for equipment, they just pitch up late on the bus so they get quite brutal. They just say it as it is so it does actually make students reflect also on their performance.' (A2)

The disadvantage raised in this study is that students tend to be biased towards friends.

'Sometimes the students are biased towards their friends with the peer assessments, because the students will inflate the marks.' (A4)

In the literature, peer evaluation demonstrates many strengths and was noted for being effective for assessing skills acquisition and attitude learning such as integrity and respect (Boulos, Maramba & Wheeler, 2006). Students perceived this form of assessment to be a non-threatening exercise, being done by fellow colleagues, which offers them an opportunity to compare their own work against the standards achieved by others (Van Rosenda, Jennet, Lockyer, et al., 1994). While this can contribute to developing reflective practices and deeper learning, some students were skeptical, and questioned the credentials of peers (Ferris & O'Flynn, 2015). Moreover, this type of assessment is based on trust, and in its absence, this exercise can be undermining and destructive (Ferris & O'Flynn, 2015). Peer assessment ranks high in Bloom's taxonomy, as it tests the analysis of knowledge, while in Miller's framework, it demonstrates action (does) and develops graduate competencies of health care practitioner, scholar and professional. To avoid bias, however, Race et al. suggest the use of designated criteria, and that a mark be allocated to each item before the assessment process begins (Race, Brown & Smith, 2005). In addition, they contend that the final grade of a student being assessed should be a combined percentage of both their peers' and the academics' scores.

Review of assessment methods

A review of the assessment methods indicated by the academics in Theme 2 was conducted using inductive analysis. Each assessment strategy was examined for its strengths and limitations, and how it related to the learning outcome and development of graduate competencies. It also showed how each method ranked against the revised Bloom's taxonomy and Miller's framework of clinical competence (Table 2).

Table 2: Strengths and limitations of assessment methods outlined in this study

Assessment Method	Learning outcomes	Graduate competencies	Strengths	limitations	Bloom's taxonomy	Miller's taxonomy
Written Assessments Eg. Tests, assignments, essays	Knowledge, ability to solve problems, PHC principles	Health care practitioner & Scholar	Can assess large content, High reliability	May seem artificial – removed from real situations Essays-time consuming to mark	Remembering	Knows
Oral assessments Eg. Seminars, case presentations, oral exams	Knowledge, clinical reasoning, clinical skills, communication skills, collaborative skills	Health care practitioner, Communicator, Collaborator, Scholar & Professional	Feedback provided by credible experts	Subjective, time consuming, requires 2 or more examiners to rule out bias, difficult to detect weak student in group presentations.	Understanding	Knows how
Portfolio of evidence	Competence, analytic writing skills, organisational skills, clinical skills& professional development	Health care practitioner, Scholar & Professional	Fosters reflections, shows evidence of learning taking place	Time consuming to compile and mark, Low to moderate reliability	Applying analysing	Shows how
Blogging	Knowledge creation and sharing, communication skills & lifelong learning skills	Health care practitioner, Scholar & Professional	Student centred ,critical reflection, critical thinking	Not for summative assessment	Applying analysing	Shows how
Self & peer assessment, Reflective journals	Teamwork, professionalism, interpersonal relationships, behaviour, skills, attitudes,& beliefs	Health care practitioner, Scholar & Professional	Encourages reflection, promotes life-long learning, insightful.	Peer assessment can be biased towards friends, undermining destructive	Applying analysing	Shows how
Performance Assessments Eg Clinical assessments, Logbook entry	Knowledge, clinical reasoning & skills, communication skills, competence, professionalism, adaptability to work environment & PHC principles	Health care practitioner, Communicator, Scholar & Professional	Very realistic and accurate way of assessing student's abilities, valid and authentic, resembles real life situations.	Subjective, time consuming Inadequate reliability due to lack of standardization	Creating	Does/action

A variety of methods were noted, ranging from simple tests, assignments and essays, which test lower order thinking, to complex case presentations, clinical assessments, blogging and

portfolio assessments, which test higher order thinking. Table 2 indicates that most of the methods used by the academics were testing higher order thinking, according to Bloom and Miller, which shows relevance, as the students who attend CBE programs are exist level students, and need to meet the graduate competencies in preparation for the work environment. Most of the methods meet two or more of these competencies but not all with assessment in the roles of being a leader, manager and advocator being lacking.

When designing assessment for CBE, academics should consider multiple methods that test a range of graduate competencies as a single method is inadequate to assess a range of competencies. More importantly, assessment must relate to the context of the disease prevalence and socio-economic status of the community setting, so that it can reflect student's personal, professional and social growth. Furthermore, assessment must be fit for purpose, namely: to test knowledge and its application; use tests, assignments, essays ('knows' of Miller's model), and case presentations to test competence ('knows how'), portfolios, blogging and peer assessment to test performance ('shows how'), and clinical assessments and logbooks to test action ('does'). More innovative assessments are required to establish graduate competencies in the roles of leader, manager and advocate. This is further supported by Al-Wardy, (2010) who confers that each assessment has its own strengths and flaws, and that by using a variety of methods, the advantages of one may overcome the disadvantages of another.

Strengths and limitations of the study

The study provided useful data regarding assessing the methods used in community-based education and how they can contribute to preparing a graduate for the work environment. The findings may be applicable to academics in an environment where students are undertaking community-based training. A limitation is that the study only explored the opinion of one academic in each discipline, and did not take into account their experience with assessing such situations. As CBE in this institution is fairly new for most academics, their opinions may change over time, as they modify the content to address perceived limitations of choice and context of assessment methods they may use.

Recommendations

For those disciplines that rely on the academics to conduct assessments at community sites, this skill needs to be transferred to the clinical supervisors who have the competence to undertake the evaluations. This can be done by empowering clinical staff at community-based clinical training platforms by running training workshops or as a CPD activity. Research needs

to be conducted to establish the extent to which the students have taken ownership of their learning, and whether the opportunities for self-reflections and peer assessments are of use or could be improved. In designing assessment methods, academics should consider those that are relevant to attaining graduate competencies specifically in the roles of leader, manager and advocate.

Conclusion

The study findings indicated that assessment plays an important role in consolidating student learning at CBE sites, with multiple assessment methods being required to achieve graduate competencies in preparation for the workplace. The choice of assessment methods must be contextual and fit for purpose to allow for overall student development. Greater emphasis should be placed on enabling clinical supervisors to perform student assessment at these sites and engaging students with self-reflective assessment practices to promote life-long learning.

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5.4 Manuscript 4

What is the capacity for dental clinics within the Department of Health to support student-centred service learning? - A case study from the eThekweni District

This study investigated the capacity for dental clinics within the Department of Health to support service learning for dental therapy students. It explored community health care centres and regional hospitals as potential learning sites.

The manuscript addressed objective three which was to identify support for interdisciplinary community-based clinical training in the public health sector within the KwaZulu-Natal Department of Health. This study linked to the aim and topic by ensuring that the sites selected, created conducive learning environments that would maximize student learning.

The findings indicated that there were many opportunities within the Department of Health for student development, however, sites must be selected depending on their capacity to support student training needs in terms of offering the full range of dental services within the scope of a dental therapist, and having the necessary dental equipment and consumables for the provision of these services.

What is the capacity for dental clinics within the Department of Health to support student-centred service learning? - A case study from the eThekweni District

Abstract

Background. The Department of Health has a goal to increase its health care workforce to meet the demands of its population. To increase the workforce, the University of KwaZulu-Natal has increased its student intake of health professional students. The two institutions, working towards a common goal, have collaborated to expand the current clinical training platforms to accommodate the larger student numbers. Through this collaboration, the DoH offered its community health care facilities and hospitals as sites for student training. However, in planning to expand the clinical training platforms for undergraduate dental students, it is important to first determine the capacity of these sites to support training.

Objectives. The purpose of this study was to determine the capacity for dental clinics within the Department of Health to support service learning for dental therapy students.

Methods. This was an explorative study, using both quantitative and qualitative methods to obtain the study objective. The quantitative method being an on-site inspection using a checklist to determine the available resources of selected sites and the qualitative method being interviews with the dental clinical managers to determine the opportunities and barriers for dental therapy student training. Ethical clearance was obtained from UKZN.

Results. This study revealed that many opportunities exist at DoH sites including improving professional skills, participation in community initiatives, facilitation into work environment and interprofessional collaboration. Barriers such as space constraints and students delaying

the work progress were also identified. However, sites must be identified depending on their capacity to support student training needs. Identified sites should provide a full range of dental services within the scope of a dental therapist and have the dental equipment and consumables for dental procedures.

Conclusion. This study shows that when planning to expand the clinical training platforms for undergraduate dental students, it is important to first determine the capacity of these sites in supporting student training. This can be achieved through a logical process which entails a site inspection and engagement with dental clinical managers.

Keywords. Community-based learning, DoH sites, support for student-centred learning.

Introduction

Health care provision is proving to be a major challenge as health systems in many countries, including South Africa, struggle to meet the demands of populations presenting with an increasing complexity of disease burden.^[1] Moreover, providing affordable oral health care to the majority has been a problem in South Africa.^[2] To optimise service delivery to all, the Department of Health (DoH) adopted the Primary Health Care (PHC) approach where the main focus is prevention of diseases, health promotion and curative treatment,^[3] including a basic oral health care package consisting of preventive and promotive oral health services and curative care with services of an oral examination, intraoral radiographs, scaling and polishing, simple restorations and dental extractions.^[4] However, there is a serious need for increasing the number of health professionals to adequately deliver primary care to the population of KZN. Academic institutions play a vital role in producing various cadres of health care professionals to meet the skills demand, but the education of health professionals should be aligned to the needs of the health system as there is a mismatch in graduate competencies to patient and population needs.^[1] According to Frenk, this is due to education systems perpetuating outdated curricula, focusing mainly on technical competencies with infrequent patient encounters in hospital-based settings rather than continuous patient exposure in primary care.^[1]

The University of KwaZulu-Natal, in its drive to become more socially accountable, has embarked on a business plan to better align its student health professional training to the needs of the health system.^[5] The main aim of the plan is to adopt a Primary Health Care Curriculum to ensure training of health professionals is in the context of PHC and to increase the student enrolment in the College of Health Sciences which currently trains medical doctors, nurses,

pharmacists, audiologists, dental therapists, physiotherapists, speech language pathologists, optometrists, occupational therapists and sport scientists.^[6] However, a serious problem arises in that the existing clinical training platforms will not adequately cope with the larger student numbers,^[5] more especially with the Discipline of Dentistry where student enrolment is limited because of constraints in pre-clinical and clinical facilities, infrastructure and human resources at the current training site. ^[7] Thus the University has collaborated with the DoH in a Memorandum of Understanding document to expand the clinical training platforms to sites within KZN including Regional Hospitals, District Hospitals, Primary Health Clinics and Community Health Centres in the form of community-based education for all health care professionals in training. ^[8] These sites can include local sites in the eThekweni district for students to make day visits there, attend to patients and return to the institution in the afternoons and decentralised sites in different regions of KZN for longer clinical placements where students would require accommodation for a period of time within the community.

Community-based training allows a health science student to acquire professional competencies in real-world settings. ^[9] By expanding their professional and clinical skills into community settings, dental students can be exposed to a wider variety of patients and procedures than in their own dental training environment.^[10] Service-learning is a teaching and learning strategy which takes community-based training to a higher level whereby dental students have opportunities to develop professionally, personally, socially and can have a deeper understanding of patients in varied social and cultural contexts and their effects on oral health. ^[9,10] Through expansion of clinical training platforms, access to oral health care services can also be improved as students can be viewed as increased workforce members. Moreover, learning would be contextualised within the scope of practice of the dental therapist as the main reason for the inception of this cadre of health care worker was to improve access of oral health care to disadvantaged and rural communities. ^[7] It is also envisioned that if students are subjected to CBE, their thinking would be focused towards the public sector and they will be motivated to return to work in these areas. ^[7]

However, in planning to expand the clinical training platforms for undergraduate dental students, it is important to first determine the capacity of these sites to support the training needs of the Discipline of Dentistry which offers a three year degree program in Dental Therapy. Clinical training, conducted in second and third year, include clinical examination of patients, diagnosis of oral health problems, treatment planning, procedures such as scaling and

polishing, direct restorations and dental extractions of both deciduous and permanent teeth under local anaesthesia. As per the discipline's rules, these clinical procedures have prescribed quotas for completion by students to show competence. The selection of clinical training sites is thus an important aspect for effective training and depends whether dental clinics can meet the training requirements in all aspects related to the scope of practice of a dental therapist. The purpose of this study was to determine the capacity for dental clinics within the Department of Health to support student-centred learning for dental therapy students.

Methods

Research design

This was a descriptive study, using both quantitative and qualitative data to determine the capacity for support of community-based education for undergraduate dental therapy students at various dental departments in the DOH. This study was part of a larger research project conducted on community-based education in the School of Health Sciences. Ethical clearance was obtained from the Humanities and Social Sciences Research Committee, UKZN (HSS/1060/015D).

The quantitative component of this study included an on-site inspection of dental clinics to determine the available resources and infrastructure that can support community-based training for dental students. However, sites were selected based on specific inclusion criteria:

- Dental clinics with 3 or more consulting rooms to accommodate 5 or more students at a time.
- Types of dental services offered including exodontia, restorative and preventive procedures.

Selection of the sites were made through telephonic enquiry using a list of provincial hospitals in KZN and the CHCs in eThekweni district. Sites were excluded if they did not have a dental department or having very limited space of 1 dental surgery or 2 small surgeries. (Figure 1). A final study sample of 6 CHCs and 12 hospitals was selected. Gatekeeper permission was sought to conduct research at the selected sites (KZ_2015_RP43_50. The sites were listed as DoH1-DoH18 and included sites from urban, peri-urban and rural areas of the various regions in KZN (Table 1). A separate data capture sheet was used for each site to record the available resources. The quantitative data from each sheet was then extracted and collated to form a comprehensive

list of available resources. The data was analysed using Excel software and basic measures of description in the form of tables and graphs were presented.

A final study sample of six CHCs and twelve hospitals were selected. Gatekeeper permission was sought to conduct research at the selected sites (KZ_2015_RP43_50) (Appendix 6)

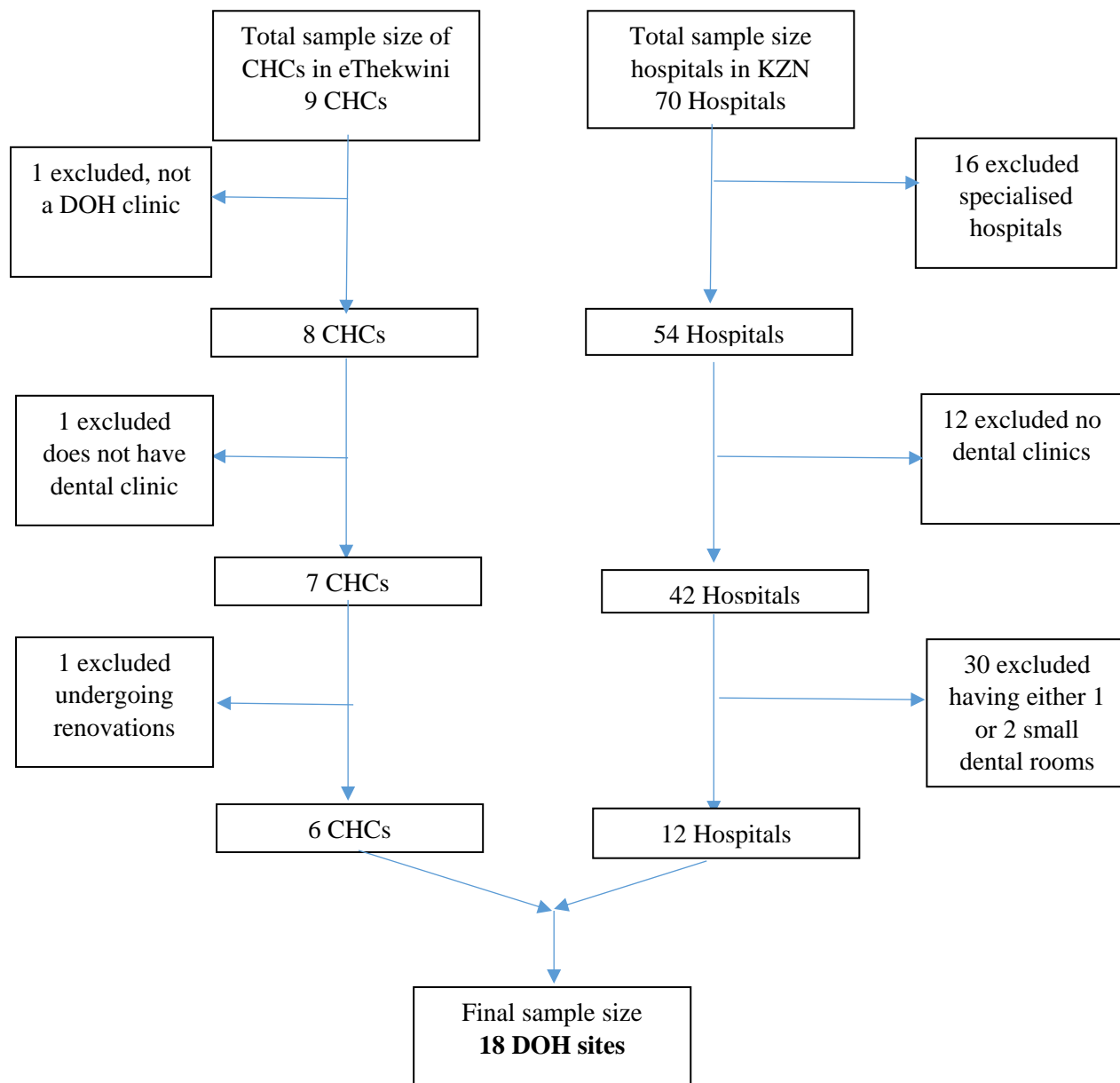


Figure 4.1: Study sample size

Table 1: Distribution of the study sample

DOH site	n	sites
Community Health care centres	n=6	DOH1-DOH6
Region 1 hospitals (Urban complex)	n=2	DOH7- DOH8
Region 2 hospitals (central KZN)	n=1	DOH9
Region 3 hospitals (Western KZN)	n=2	DOH10-DOH11
Region 4 hospitals (Northern KZN)	n=3	DOH12,DOH13, DOH14
Region 5 hospitals (Southern KZN)	n=4	DOH15, DOH16, DOH17, DOH18

The qualitative component included face-to-face, interviews with participants who were selected using a purposive sampling method and included the clinical managers of the selected CHCs and hospitals. In addition an interview was conducted with the Provincial Oral Health Manager DoH / General Manager: Public Health and Non-Communicable Diseases to obtain a better understanding of the collaboration between the DoH and the institution. The interviews, guided by a semi-structured interview schedule, included sample questions such as; what oral health care services are being provided? What are the opportunities and barriers for clinical training of dental students at this institution? How will student supervision be undertaken? The interviews, digitally recorded and lasting approximately 30 minutes were scheduled at the interviewee's convenience.

A research assistant transcribed the interviews verbatim and then cleaned the data. The data set of each clinical manager was coded. Coding was done manually to identify common patterns. Codes were organised into themes and sub-themes according to Braun and Clark. ^[11] Participants were identified as CM1- CM19 from the DoH sites and the provincial manager respectively to maintain anonymity and confidentiality. Trustworthiness was established by ensuring the questions to interviewees were directly linked to the objective of the study. Credibility was established by using various methods for data collection such as interviews and site inspections. Conformability was established through use of direct quotes to explain respondents' perspectives.

Results

The site inspections of the DoH sites revealed that a range of preventive and curative dental services were offered. (Figure 2. While all sites (n=18 performed dental extractions, n=3 did not offer restorative procedures and n=1 did not offer scaling and polishing.

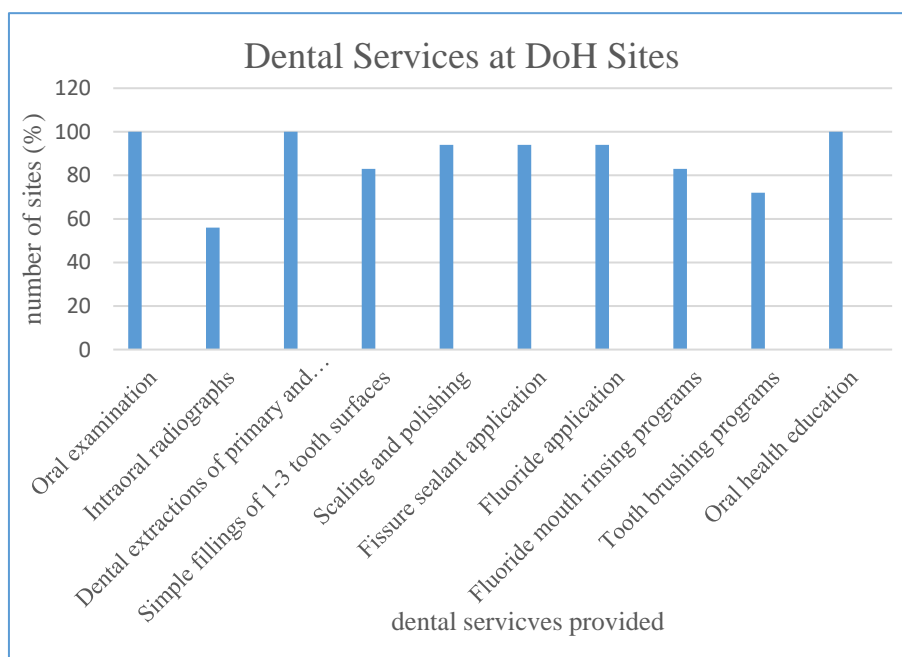


Figure 2: Dental services provided at DoH sites

The on-site inspection also revealed that the DoH sites are well resourced in terms of equipment (Table 2). However, some sites were better equipped for certain dental procedures than others namely, all clinics showed the necessary equipment for tooth extractions while some did not have all equipment for restorative procedures (n=1) and scaling and polishing (n=2). Likewise, the dental consumables for restorative procedures were also lacking in certain sites (n=2) and n=1 for scaling and polishing. (Figure 3). In addition, only 61% (n=11) of the sites had an x-ray unit situated in the dental clinic. While some sites had digital radiography (n=2), others had access to extra-oral radiography services at the X-Ray department of the hospitals (n= 5) and some had x-ray machines that were not in working order (n= 2).

Table 2: Dental equipment available at DoH sites

item	n(%)	item	n(%)
fully fitted dental chair with overhead light	18(100%)	Suction	17(94%)
sterilising area	18(100%)	dental forceps for adult and deciduous tooth extractions	18(100%)
sterile instruments for every patient	18(100%)	Dental syringes	18(100%)
dental autoclave	18(100%)	dental hand instruments for restorations	17(94%)

ultrasonic scaler	16(89%)	dental X-ray unit	11(61%)
fast handpiece in working order	17(94%)	dental X-ray film processor	8 (44%)
slow handpiece in working order	17(94%)	lead apron	10 (55%)
dental operating stools X2	17(94%)	X-ray view box	6 (33%)
amalgamator	16(89%)	medical emergency trolley	15(83%)
visible curing light	18(100%)	portable oxygen cylinder	15(83%)

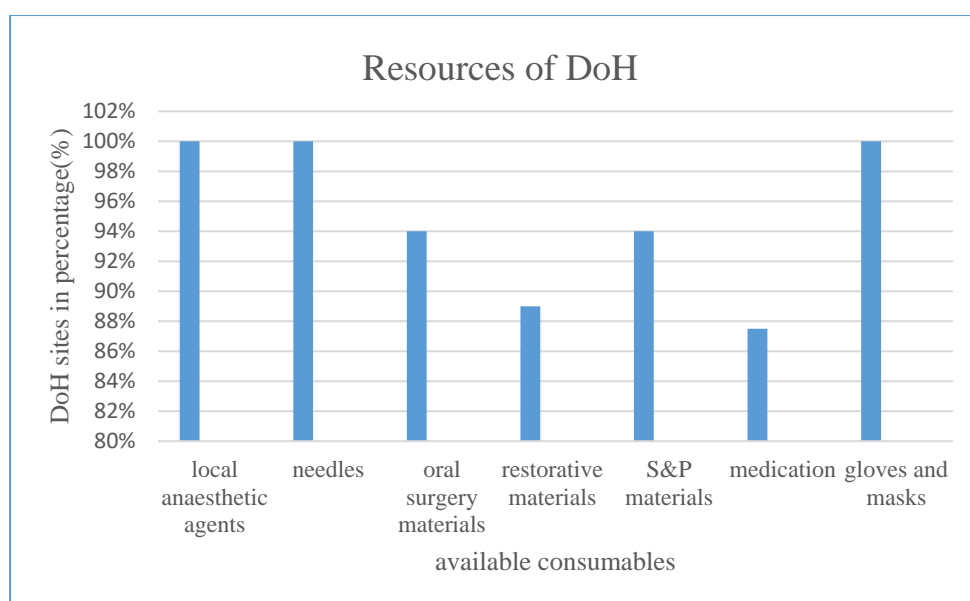


Figure 3: Checklist of available consumables at DoH sites

The qualitative data from the interviews had four key themes emerging; clinical learning opportunities, hindrances to clinical training, supervision and concerns raised.

Theme 1: Clinical learning opportunities

Under this theme, several sub-themes emerged such as developing professional skills, facilitating transition into the workplace, opportunities to participate in community initiatives and interprofessional collaboration:

Developing professional skills

Clinical managers indicated that students, through increased clinical exposure, could improve clinical skills, master dental procedures and observe many different forms of pathology (Table 3).

Table 3: Developing professional skills

Opportunities arising	Participants' quotes
Improving clinical skills	<p>'Increased clinical exposure...an opportunity to improve skill and speed.' (CM 13)</p> <p>'It is a very busy dental clinic-students can be exposed to various dental problems which can help them make good diagnosis and treatment planning.' (CM 8)</p> <p>'they can learn a lot and gain lots of experience.' (CM 14)</p>
Clinical observation of pathology	<p>'They are also exposed to lot of pathology that you don't normally see when you training as a student.' (CM 16)</p> <p>'..better insight into pain and sepsis relief compared to what they learn at university.' (CM 1)</p>
Mastery of procedures	<p>'They can learn to perform extractions well as there are many patients here.'(CM 7)</p> <p>'..a great opportunity for students to be exposed to various dental procedures at a busy dental department.'(CM 15)</p>
Contextual learning	<p>'...it will allow the students to have hands on practical experience – primary health care as compared to tertiary level in hospitals.'(CM4)</p>
Conducive learning environment	<p>'The department can provide the infrastructure, the space, access to the patients.' (CM 19)</p> <p>'Fully functional consulting rooms at their disposal; Adequate supply of dental consumables and instruments.' (CM 13)</p>

Transition into work environment

Some of the clinical managers reported that students could have opportunities of learning to adapt to the work environment. They viewed this as being a mutually beneficial process, as while students gain experience, their presence could increase workforce numbers (Table 4).

Table 4: Experience of the work environment

Opportunities arising	Participants' quotes
Change in the learning environment	<p>'It has elements of deinstitutionalisation to a certain extent where training occurs closest to where the community is.' (CM 19)</p> <p>'... give them a true side of what it is like to work in government institution... adapting to different settings and situations. It is different from a structured, rigid set up at dental school.' (CM1)</p>
Orientation of work environment	<p>'A feel of the natural working environment.' (CM13)</p> <p>'...they get to learn how to adapt to a work environment so when they get work next year they know exactly how to work as some graduates struggle when they start work initially-it can up to 6 months for some people to get used to work which is different from when they were students.' (CM15)</p>
Increasing the workforce	<p>'I also see this as an opportunity to assist the Department of Health because when students come here -they will be helping us too.' (CM15)</p> <p>'...great help for the Oral Hygienist as she has been working alone and there is a great catchment area for her.' (CM 3)</p>

Participation in community initiatives

The respondents reported that opportunities existed for students to participate on various community programs including going to CHCs around the hospitals, accompanying the oral hygienist to schools and participation in the mobile dental services (Table 5).

Table 5: Opportunities to participate in community initiatives

Sub-themes arising	Respondents' quotes
Community Health Centres	<p>'We have established Community Health Centres about 15km from here. The basic dental services are being done there on a daily basis- students can get hands on experience. (CM 15)</p> <p>'... Students can benefit from going to community health clinics as these are really rural and they can have first-hand experience of what these communities present with.' (CM14)</p>
School-health programs	<p>'Exposed to working with oral hygienists and school health programs on weekly basis- dental screening, toothbrushing programs, Oral health education.' (CM 1)</p>
Mobile services	<p>'We have 2 mobile units which we use for school programs - we do fissure sealants at schools - the students can go on this and get good exposure of the surrounding community.' (CM 11)</p> <p>'Mobile bus of DOH that provides dental services - we are part of this when they come to this area. They come here 3 times a year - students can also join us.'(CM3)</p>

Interprofessional education

Clinical managers, mainly from the CHCs, indicated that there are also opportunities for dental students to work in interprofessional teams to holistically manage patients. They listed some benefits of a team approach with one citing an example of working closely with physiotherapists and another with nurses (Table 6).

Table 6: Interprofessional collaboration

Opportunities arising	Participants' quotes
Clinics designed for interprofessional practice	<p>'when you look at the design we now have, the new facilities are designed according to the clinical disciplines of chronic diseases... the chronic teams are together. The acute care and the mother and child, eye and dental are all put together so clinical integration must be translated into an infrastructure or design architecturally. With this new design, it will create opportunities for students to learn in</p>

	this interdisciplinary approach because when they qualify they expected to work like this.’ (CM 19)
Holistic patient management	‘Physiotherapist are exposed to different set of patients, stroke patients, cerebral palsy patients, MVA patients that are referred to them from the medical practitioner. Dental students can interact with them and give oral health education to these patients in their rehab phase.(CM1)
Team approach	‘There is scope for student dental therapists, physiotherapists, optometrists and occupational therapist, dieticians. It would be good to have all cadre of health care workers to work together.’ (CM 6)
Learning referral patterns	‘...the whole referral system.eg patient with post-op bleeding - the nurses don’t know how to manage this if patients come back late at night with this problem. High BP, patient has to be referred before we can extract their teeth.’ (CM 3)
Getting to know other health professionals	‘An opportunity to learn about the role of other health professionals.’ (CM 3) ‘Students will get to work closely with other HP, nurses, medical doctors.’ (CM 4)
Seeking assistance from other professionals	‘We also encounter many occupational injuries - musculo-skeletal disorders as we do a lot of extractions; we can learn from Physiotherapists how to work with our hands better to prevent carpal-tunnel’s syndrome.’ (CM 1)

Theme 2: Hindrances to Clinical training

The main hindrance to service learning at the DOH sites as perceived by the participants was the limited space in their clinics to accommodate students as illustrated by the following quotes:

‘Most of these community health centres have one or two dental rooms, one or two dental chairs.’ (CM 19), ‘...the rooms are very small and are shared by many staff.’ (CM 5)

Although managers offered the opportunity of students going to the surrounding CHCs, they noted that transport to these clinics, would be a major barrier. Other problems included limited

resources and non-functional dental equipment. A few managers perceived that students working in these sites can slow down work progress as illustrated by the following quote:

‘If they fracture teeth and are unable to remove the roots- it will be a task for the dentist - this will delay our work and increase patient waiting time.’

Theme 3: Supervision of students

The question posed to supervisors regarding supervision was: How will student supervision be undertaken? Several sub-themes arose in response to this question such as, planning a special program, providing mentorship and creating diverse experiences (Table 7).

Table 7: Clinical Managers perspectives on student supervision

Sub-themes arising	Participants’ quotes
Planning and implementing a special program for students	‘I will have to devise a program so that students are fully exposed to all procedures. It will be an everyday hands on experience and they will be guided by our staff.’ (CM 15)
Individual supervision	‘The dental therapist and dentist are willing to supervise students on a one-to-one basis- with close supervision of every step of each procedure.’ (CM 7)
Students slotting into work schedule	‘Extractions are performed in the mornings; appointments for restorations are given for the afternoons. The hygienist does scaling & polishing throughout the day. In this way, students can get adequate exposure to all procedures.’ (CM 13)
Diversity of experiences	‘I will allocate some students to do extractions, while others can do restorations and some to the other clinics on a rotational basis.’ (CM 14) ‘We have very good infection control measures in place and students can be exposed to this too.’ (CM 15)
Ensuring supervision resembles that of teaching institution	‘We have to make sure that we are at the cutting edge of academia as when we leave the academic institution, we sometimes cut corners or we do things not exactly as we were taught - from our experience we know what works for us, but when students are here

	we need to show them the proper techniques that were taught to them.’ (CM 15)
	‘Students must use medical history forms for the first week – I would like for students to do this perfectly as they would do this in the training site and then in second week we will expect them to work much faster and do only a verbal case presentation for each patient.’ (CM 13)
Providing experienced mentorship	‘I will personally supervise students- I know how this is done as I worked with students before and know what is expected.’ (CM 8) ‘We have experienced dentists and dental therapist here who are very competent. We will share the workload and distribute students to all staff so that they could learn from each one.’ (CM 15)
Role modelling	‘Shadowing the qualified dentist... each step would be carefully monitored.’ (CM 10)

Theme 4: Concerns raised

Clinical managers have raised certain concerns about students’ presence in their clinics. One important concern was the level of competency attained before they arrive at the sites: *‘They must have basic skill in doing these procedures independently, they must know how to inject, extract and restore a tooth - they must have completed a certain number of these procedures before coming to us so as not to hamper our work schedule.’* (CM 7) Another concern raised was student conduct. *‘They will probably be staying at an accommodation outside the hospital. They may misbehave there, people will know that they are linked to this hospital and will give it a bad reputation. We work in a professional environment, students must respect that and behave professionally in the hospital as well as in their accommodation.’* (CM 15) Some clinical managers expressed concern about the supervision process and wanted some orientation.

Discussion

By undertaking this study, useful information was gleaned regarding the capacity of DoH to support student-centred service learning. The basic requirements for optimal student training is fully functional dental equipment and consumables made easily available for students to perform all dental procedures within their scope of practice. The DoH sites demonstrated the ability to meet the requirements necessary for student training in terms of types of dental

treatment offered, dental equipment and consumables. The only service not optimally offered was intraoral radiography. At the teaching institution it is important for students to take radiographs for every patient they treat. The rationale behind this is to improve the skill of taking radiographs, make correct interpretations of such radiographs, facilitate the diagnostic process and for proper case presentations. However, students must realise that this is not a norm in the real-world settings, where every patient warrants an x-ray and x-rays are only taken as an aid to diagnosis when the clinician is unsure of the diagnosis based only on clinical examination.

Although most sites had the basic dental equipment, sometimes they were not fully functional. Similarly, some sites did not have the all the equipment and consumables necessary for restorative and preventative procedures. This can impact negatively on student training. This is further supported by one of the clinical managers who indicated *'students won't get the complete exposure to all dental procedures as we do mainly extractions, few scalings and restorations.'*

Mismatch in student training and current practice in DoH sites

It was observed that there is a trend towards only doing composite restorations with some clinics not even having an amalgamator or amalgam restorative material. The Minemata convention, 2013 called for a phase-down in the use of amalgams due to concerns of mercury toxicity and the environment's risk to amalgam,^[12] resulting in a shift towards composites.^[13] However, amalgam will not be completely phased out until it is replaced by an appropriate alternative^[14] and still remains a material of choice in developing countries.^[14] Although the phase-down of amalgams has teaching implications for changing from amalgam to composites, most dental schools still continue using amalgam for undergraduate clinical training and clinical assessments.^[13] While UKZN dental students need to gain experience in working with amalgam to satisfy clinical quotas and in preparation for their final clinical assessment, it can be argued that there is a mismatch between student training and current practices and trends. However, the Dental Deans Committee of South Africa has taken a decision that dental schools will continue to teach the use of both amalgam and composite dental materials as students need to master the techniques for both the materials and will only stop the training of amalgam if a suitable alternative is developed.^[15]

In the teaching institution, students are driven by clinical quotas for dental procedures to attain competency and practice in subject-specific silos to meet these quotas, meaning that they have separate sessions for restorative dentistry and for exodontia on a daily basis. However, the DoH

sites can provide opportunities for patient-centred care, attending to needs of each patient as they come in and providing holistic dental services. This perhaps, further highlights another mismatch in student training and current practice which demonstrates a need for curriculum overhaul where student training should be more aligned to the current practice that prevails in the health system. In the teaching institution, students may only attend to one or two patients in a session, however at the DoH sites, there are opportunities of seeing many patients a day. This can lead to a more meaningful student learning in the context of a dental therapist's scope of practice. This is further supported by Knight who reported that by placing dental students in community settings, they treat more patients in a clinical session and through this increased patient exposure, they gain more clinical efficiency and confidence than in a dental school hospital. ^[16]

Student-centred learning

The interviews with the clinical managers revealed that there were many learning opportunities for self-development. By providing opportunities for students to learn in environments different from the dental teaching institution, the focus of training changes. In the teaching institution, acquisition of knowledge and technical skills is considered as successful dental training. ^[17] This is based on using a teacher-centred approach where information is passed from expert teacher to learner who passively assimilates this knowledge. At the decentralised community settings, the focus changes to a more student-centred approach where the students acquire knowledge through on the spot decision-making and learning is facilitated by practical teachers and role models. ^[17] In this way, students take ownership of their learning through trial and error and being able to self-reflect and self-assess which can promote life-long learning throughout their careers. ^[17] This is further supported by Gordon who demonstrated that student learning and clinical competencies depends on a supportive environment to build these skills and positive reinforcement from clinical supervisors. ^[18]

It is noteworthy to observe that students would be welcomed as novice team members and considered as expansion of the workforce. Diab and Flack demonstrated that one of the main effects of students in community settings was providing assistance to reduce the day's patient load. ^[19] Learning in an actual working environment facilitates the transition of the role from a student to a graduate to a novice practitioner. By exposing students to multiple service delivery systems, they can obtain a well-rounded clinical education which can put them into a better position for job offers in various settings and opportunities to return to service these areas. Couper et al. demonstrated that the decision of health care professionals to practice in rural

communities is enhanced by community-based rotations during training as they became more aware of community needs.^[20]

The community initiatives provide an opportunity for student interaction with the community where they can gain a better understanding of social, cultural and environmental issues that can contribute to the causes of health and oral health problems as well as social barriers to seeking care. This is further supported by Knight in that CBE adds value beyond just caring for patients, but providing students with first-hand experience of barriers of customs, culture and economics to health care, it awakens a sense of responsibility in them to the well-being of communities.^[16] These programs also gives students a chance to practice primary health care principles of prevention and promotion as they can deliver oral health education and preventive services such as fissure sealants and toothbrushing programs. This feeds into the primary health care model envisioned by the institution.

Working in interprofessional teams is an excellent learning opportunity as when health professionals qualify they are expected to work in health care teams yet their training occurs in silos. The main benefits of interprofessional collaboration include improved patient care, holistic management of patients, better communication between health professionals and a better understanding of each other's roles.^[21] The benefits of interprofessional education (IPE) is well documented in literature yet it is not a norm at this institution. By exposing students to CBE at DoH sites, the institution will be creating opportunities for IPE among student health professionals.

Perceived hindrances to student training

Most clinical managers participating in the study, cited constraints of space within their clinics as the main barrier to support student training. Having limited space can impact on the number of students that can be accommodated at a time in a particular site. Although the sites had 3 or more dental rooms or surgeries it was still regarded as a barrier to student training. Doherty pointed out that having adequate teaching space is a priority for effective CBE programs.^[22] More so, in Dentistry as having small surgeries with limited space to accommodate dental operators, dental assistants, patient and students may prove hazardous because this increases their risk of percutaneous exposure incidents (PEI).^[23] Percutaneous exposure incidents are injuries to health care workers through needle stick pricks, injury with a contaminated sharp instrument, as well as cutaneous and mucosal exposures to blood, saliva, tissue and other bodily fluids that are potentially infectious.^[23] Health care workers in the field of Dentistry are

particularly vulnerable, as the dental environment is unique when compared with other health care settings due to the oral cavity being a small working field and the close contact that is required between dental personnel with the patient during procedures. ^[24] The possibility of sudden movements of the patient when using sharp dental instruments increases the likelihood of risk, ^[24] thus making adequate clinical space an important criteria in student training.

The assumption that students may slow down the work pace is justified as students are inexperienced and are far slower than qualified and experienced dental professionals. The presence of students should not impede service delivery in any way. This problem was also highlighted by Doherty who found that clinical staff perceived that students' presence can lead to aggravated workloads though slowing down of consultations and procedures. ^[22] However, other studies conducted in Australia and Philippines value students' presence as they assist with heavy workloads. ^[22] As a suggestion, while some clinical staff are involved with student training, others should continue attending to patients to ensure continuity of service delivery. It is also important that patients should be informed that students are working and to expect some delay.

Another hindrance perceived by managers was the transport from the hospitals to surrounding CHCs. It is the responsibility of the institution to provide transport for the students to the sites and surrounding CHCs that students would be travelling to.

Student preparedness

Some clinical managers were concerned about the level of clinical competency on arrival at the sites. This is an important concern and it is the responsibility of academics to ensure that basic clinical skills and techniques are taught and students must have acquired a minimum competency level, social maturity and problem solving skills before assigning students to external sites.

Another concern raised was student conduct on and off the DoH sites. The college has developed a booklet on guidelines for students to follow while at a decentralised training site. ^[25] Students need to be orientated by academics before they start rotations and given the booklets. They are young adults, however, they are health professionals in training and as such should always conduct themselves in a professional manner and not bring disrepute to the DoH site and the institution in any way. ^[25]

Clinical supervision

Clinical staff can become teachers and role models outside the teaching institution. However, they need to be orientated and guided by academic staff on supervision before students start their rotations. Training should be provided to supervising clinicians with ongoing practical support offered.^[17] Academics should collaborate with site supervisors and develop an open communication to provide support and for them to relay any concerns while students are present at external sites. This is further supported by Wilson et al. who noted that sustainability of CBE is dependent on collegial interaction between academics and health professionals at teaching sites.^[26] There should also be review sessions held after all the rotations to receive feedback on students and how to strengthen the student learning process. It is important to create a positive learning environment and the clinical supervisor plays a pivotal role in this.^[18] This is further supported by Katzenellenbogen et al. who reported that positive experiences for students through good supervision and support during community-based placements enhances student learning.^[27]

Strengths and Limitations of study

The strength of this study is that it provides baseline data to show that the selection of clinical training sites for dental students follows a logical process. This process includes selecting potential sites, doing an on-site inspection to determine the resources available to support student training and engaging with the dental clinical managers to determine the opportunities and barriers to training. The limitation is that clinical staff were not interviewed to determine their perspectives on student supervision and any context specific challenges that they may experience. Also, the generalizability of the qualitative data of the study was limited to only one province. More research is therefore needed in this area.

Conclusion

This study showed that in planning to expand the clinical training platforms for undergraduate dental students, it is important to first determine the capacity of these sites in supporting clinical training needs in terms of clinical space, available resources, optimal student supervision and the number of students that can be accommodated. The study revealed that there are many sites that can provide supportive environments for student-centred service learning. By situating learning at selected sites, there are many opportunities for student development.

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5.5 Manuscript 5

How can non-governmental and private sectors support community-based training of dental therapy students in KwaZulu-Natal?

This study explored experiential learning opportunities for dental therapy students through community driven health initiatives of the non-governmental and private sectors. Organisations within the non-governmental and private sectors, attempted to supplement the public health services by increasing access to health care through service delivery in underserved communities on a humanitarian basis.

It addressed objectives four and five which were to explore interdisciplinary community-based learning opportunities for dental therapy training with key role players in the non-governmental sector and private sectors in KwaZulu-Natal. The results of this study showed that there were several innovative community-driven service delivery projects which could provide rich learning experiences for students. According to the participants, students participating in these projects, could benefit significantly by having opportunities for professional and personal development and a deeper sense of social responsibility.

How can non-governmental and private sectors support community-based training of dental therapy students in KwaZulu-Natal?

Abstract

Background. The current health system in South Africa struggles to adequately meet the health care demands of its nation, more especially in KwaZulu-Natal province with an increasing quadruple disease burden. Local communities in KZN have long since recognised the need to intervene through community-driven initiatives by non-governmental organisations and the private sector. These projects could also provide a platform for experiential learning for dental therapy students.

Objectives. To explore experiential learning opportunities for dental therapy students through community driven health initiatives of the non-governmental and private sectors in KwaZulu-Natal.

Methods. This qualitative study used face-to-face interviews with key stakeholders organising community-based initiatives in the non-governmental and private sectors. The interviews were audio-recorded and analysed using thematic analysis. Ethical clearance was obtained from UKZN.

Results. According to the participants, there were many innovative service delivery modes ranging from a mobile health bus to a container turned into a clinic to well established clinics which could provide opportunities for dental students' participation. The participants believed that by students participating in these projects, they could gain real-world experiences and a greater sense of social responsibility.

Conclusion. This study showed that there are many community driven initiatives of the private and non-governmental sectors that could provide situated learning experiences for dental therapy students. In participating in these community projects, students can develop professionally and obtain a deeper sense of social responsibility which can inspire them to volunteer their services to these projects upon graduation or initiate similar projects in other deserving communities.

Keywords: opportunities, community driven initiatives, dental therapy students, non-governmental and private sectors

How can non-governmental and private sectors support community-based training of dental therapy students in KwaZulu-Natal?

Introduction

The current health system in South Africa struggles to adequately meet the health care demands of its nation, more especially in KwaZulu-Natal province with an increasing quadruple disease burden.¹ Furthermore, KZN has a population of over ten million,² of which only 20% have some sort of medical insurance, using the private sector, leaving more than 80% of the population dependent of the public health sector for their health care needs.¹ South Africa has a shortage of health care workers, unequally distributed between the public and private sector.³ In addition, within the public sector, health care workers are located more in urban than rural areas,³ leaving many people from rural and disadvantaged communities having limited access to health care including oral health care services. As a result, many have put off treatment for their dental problems, causing long-term impacts on their physical and psychological health, thus indicating a definite gap in health services delivery.

Local communities in KZN have long since recognised the need to intervene, picking up the government's deficits in social services, via the philanthropy of donors and the socially aware, through Non-Governmental Organisations (NGOs). NGOs, entities that operate not to gain any profit and do not belong to the government, play an integral role in today's society.⁴ They include grass root community based organisations (CBOs) and faith based organisations (FBOs), which make significant contributions across many fields such as education and research, social services, health, culture and recreation, law, development and housing, etc.⁴

In health, NGOs attempt to supplement the public health services by increasing access to health care through service delivery, raising awareness and prevention programmes towards improving health outcomes.⁴ In KZN, their activities include health awareness, assessment of vital signs, examination and treatment by a medical practitioner, delivery of medications to patients, vision screening, removal of cataracts, etc. Oral health services range from oral health education and promotion, dental screenings, tooth extractions for relief of pain and sepsis, restorations, scaling and polishing, specialised work such as correction of cleft palates, etc. These services are performed by health professionals, on a voluntary basis, free of charge, in underserved and underinsured communities, helping to reduce the unmet health needs of the province and relieving over-burdened public clinics.

Moreover, private companies get involved in providing health care services, with no intention of making a profit, by providing primary health care services to the community on a humanitarian basis. These community driven health care projects undertaken by the private sector and NGOs can also serve as an innovative opportunity for active student learning by providing a rich environment for community driven training of health professional students. Karim noted an improved clinical and communication skills of student health professionals as well as a deeper understanding of the health needs and demands within local communities when health professional students participated in such projects.⁵ It also enhances social accountability by making students address priority health concerns of communities.⁵ Furthermore, it can inculcate volunteerism and a sense of moral, ethical and professional responsibility, in a student health professional, to serve the public well by providing care to all in need and will encourage graduates to continue with this once they qualify.⁵

Therefore this study aims to explore experiential learning opportunities for dental therapy students through community driven health initiatives of the NGO and private sectors in KwaZulu-Natal.

Methods

Research setting and context

The Discipline of Dentistry housed within the College of Health Sciences, UKZN, currently trains dental therapy students whose scope of practice involves preventive and curative oral health care through various procedures, such as dental examinations, diagnosis of common oral diseases, scaling and polishing, placement of direct restorations and tooth extractions. The

dental therapist is well suited to meet the oral health needs of the population in both public and private sectors in urban and rural communities.

Clinical training of dental therapy students occurs mainly at a hospital based setting with community-based training being undertaken in the second semester of the final year. Current CBE activities a two week rotation on the board the Phelophepa Health train, providing oral health care to disadvantaged communities throughout South Africa. The Phelophepa project is a private initiative that offers health professional students real-world clinical experiences while in training. Academics in the discipline believe that upon return from the train, students demonstrate improved clinical skills and self-confidence. Thus exposing students to more community settings in addition to the hospital one can significantly enhance clinical training of dental therapy students and inculcate in them a deeper sense of social responsibility.

Research design

This was a qualitative explorative study in which opportunities for community-based training for dental therapy students, in the informal sector, were explored by engaging with key stakeholders, in the private and NGO sectors, involved with organising community- based initiatives. This study was part of a larger research project conducted on community-based education in the School of Health Sciences. Ethical approval was obtained from the Humanities and Social Sciences Research Committee, UKZN (HSS/1060/015D).

Participants

To select interviewees, three NGO contacts, known to the researcher, helped to identify further participants through a snowballing sampling technique. Eleven were selected on the basis of representativeness of community-based health projects having a dental component. Of the eleven selected, nine were NGOs and two, private enterprises. An invitational e-mail was sent to each organisation to request their participation in the study, to which nine members (P1-P9) agreed to participate, and provided written informed consent.

Data collection

Data was collected through face-to-face, semi-structured interviews with key people involved in organising community-based initiatives in the NGO and private sectors. Each interview was conducted separately and lasted approximately 30 minutes. The researcher developed a set of questions to provide structure to the interviews. Sample questions included:

- What current community based projects are being undertaken by the institute?

- What motivated your institute to undertake this community based health care project?
- What health care services are being provided?
- What oral health services are offered?
- How do you choose the community you wish to assist?
- What opportunities exist for dental student participation?
- What are the opportunities and barriers for other student health professionals to participate in this project in a collaborative interdisciplinary team approach?

The interviews were audio-taped, which a research assistant transcribed verbatim and then cleaned. The researcher engaged the services of a research consultant to assist with the data analysis process. Data coding was done by both the researcher and the research consultant to identify particular features of the data, which was then sorted, allowing themes and sub-themes to emerge from the respondents' statements, according to Braun and Clarke's guide to thematic analysis.⁶

Credibility is a form of internal validity in qualitative research that establishes whether the research findings are genuine and are indeed a true reflection of the participants' original views.⁷ In this study, credibility was established through peer debriefing, undertaken by another member of the research team, who reviewed the data collection methods and processes, transcripts and data analysis procedures, and provided guidance to enhance the quality of the research findings.⁷

Transferability which relates to external validity in qualitative research, was facilitated by providing a thick description of the context of the enquiry and comparing the research findings with current literature. Dependability was achieved through use of member checks, where the analysed data was sent to a few participants to evaluate the interpretations made by the researcher. Dependability was further enhanced by both the researcher and the research consultant as a co-coder analysing the same data and comparing the results. Confirmability was established through quotations of actual dialogue of the interviewees. Participant confidentiality and anonymity were maintained.

Results and Discussion

Five main themes emerged from the data analysis process: Innovative modes of health service delivery, prospects for dental students, support provided, creating interprofessional learning opportunities and perceived barriers.

Theme 1: Innovative modes of health service delivery

Participants described innovative ways of service delivery to disadvantaged communities ranging from the use of storage containers and schools being converted to makeshift clinics to well established, NGO sponsored clinics (Table 1).

Table 1: Modes of service delivery

Methods	Participants' responses
Use of a shipping container as a mobile clinic	'We have a shipping container, converted into a mobile clinic. It has 2 partitions where we do vital signs, assessments of weight, height, BP, temperature and then for actual assessment we use the other. It is taken to the different schools and placed there and then we work until we are finished all the children and then it would be moved to another school.' (P1)
Restructuring old premises	'We had a school here and our school was moved to a larger place. This premises became available and the next service we thought that we could help the community with, was having a clinic.' (P5)
Trust funded clinic	'Another group of people that started a clinic at here but handed it over to our organization to run. About 2 years ago the charitable trust of our organization funded us for a new clinic.' (P6)
School turned into a makeshift clinic over the weekend	'For example if we are going to a community. We would go and visit the place beforehand to see whether it is okay for us to set up a dental or medical clinic there, for example to check if the classrooms have water and power supplies that we need for the equipment.' (P4)
Mobile health bus	'We decided to get a Health Mobile Bus that takes health care to the people. We wanted to offer the types of health services that parents can't really get to for their children. We wanted to provide a service at schools. We would park at a school for at least 1 week. A learner is taken to optometry section and a full assessment done there and move to the next section which is PHC and then move to dentistry.' (P9)
Offering health care packs on health awareness day	'Patients were gifted with a health pack which included toothbrushes, toothpaste and soap. The participants were given gift bags with sanitary pads, feminine products and oral hygiene products.' (P7)

Although oral health is recognised as a basic human right, the lack of appropriate and affordable oral care is still a major challenge.⁸ In South Africa, oral diseases are among the most common conditions affecting its population with dental caries affecting 90-93% people and periodontal disease, 93.5%.⁹ In KZN, Reddy & Singh reported that the caries rate among six year old children increased from 65% in 2002 to 73% in 2013, with almost 94% requiring dental treatment.¹⁰ This places a huge burden on the public health services with its limited oral health human resources.

Given this context, the common people, driven to address the needs of people and communities, have reached out informally to assist small groups of people or have organised programmes that could benefit whole communities.¹¹ This is evident in this study, in the innovative ways they used in their attempt to strengthen the health system, and assuring equity of health care to areas where there is a real need. The use of a container and the Mobile Health Bus are especially noteworthy. Mobile dental services have proven effective in several states in America in providing preventive and curative dental care in rural communities.¹² They also provide training opportunities for senior dental students. However, it can be argued that although it answers unmet dental needs of communities by offering temporary relief, they do not provide continuous care for dental diseases which cannot be treated once off.¹²

This raises an important issue of the type of dental treatment that should be offered. van Palenstein Helderman and Benzian recommend a basic package of oral health care (BPOC), consisting of oral urgent treatment including extractions, affordable fluoride toothpaste and atraumatic restorative treatment, which involves the removal of soft decayed tooth tissue and replacing it with a glass ionomer cement, as a guiding framework for dental NGOs.¹³ However, this one size fits all solution cannot be applied to different settings; an oral health package offered should be tailored to suit the needs each community.

In KZN, urgent treatment, namely tooth extractions, and more preventive oral health care should be offered including oral health education and promotion and placement of fissure sealants for six year old children. This is supported by Mickenautsch et al. who demonstrated implementing the atraumatic restorative treatment was not widely accepted in the South African context. Although it provided access to restorative treatment to people who previously did not receive any, there were several barriers to its implementation, including a large patient load, insufficient supply of materials, operators' reluctance in adopting new techniques and patients' preference to extracting rather than restoring teeth.¹⁴ This is further supported by Reddy and Singh who promote more preventive programs to curative ones, and recommend oral health promotion programmes at schools to instil good oral health behaviours at an early

age.¹⁰ The mobile health bus and the container can be considered good projects as they offer this type of oral care package which is simple, effective and inexpensive. This is in line with primary health care principles which is currently being adopted by the health system.

Theme 2: Prospects for dental therapy students

The participants indicated that there could be several opportunities for students in their programs. Under this theme, three sub-themes emerged: participation in community initiatives, adapting to a community-based setting and developing social responsibility.

Participation on community initiatives

Respondents were keen on students joining their initiatives, offering them a chance to expand existing projects, becoming part of their team and playing a role in sustainable initiatives (Table 2).

Table 2: Participation in community initiatives

Prospects	Participants' responses
Opportunity to expand existing project	<p>'Dental students can be a part of our health day initiative and screening. Dental students have suggested that they would like to do minor procedures such as extractions, cleaning etc if provided with the equipment. There is room for the project to grow and an opportunity for them to start their own referrals at the appropriate clinics.' (P7)</p> <p>'We run a dental clinic once in 2 weeks on a Friday. This clinic is run by a dentist who volunteers his services. This can be a good opportunity for dental students to come on board, so we can offer dental services every Friday, as there is a great need for this in the community we serve.' (P5)</p>
Students viewed as potential team members	<p>'The oral hygienist comes only once when we are at the school, so if your students will be here, it would be much better. I know we will complement each other when they come. Maybe I will say this child is for extraction but when they come they will say but this tooth is strong, you can still save it by cleaning and filling it, so I think that to me it is great, and the oral hygiene will improve.' (P1)</p>
Become role players in a sustainable project	<p>'Dental students can be a part of our health expo on an ongoing basis. It would be nice if dental students have a mobile clinic to do simple procedures such as tooth extractions, provide dentures. I can arrange an afternoon only for dental.' (P2)</p>

Slow integration of students into current program.

‘Maybe - we could get them to do the screenings in March to June and maybe scalings and, later in the year, they could join us for dental extractions when they are more competent. So they can get a practical experience from start to end. So you can draw up guidelines on how and where and when they can join us and as we grow – we can see how we can fit them in more. (P9)

The NGOs welcome students as additional team members to assist them in their endeavours. By them wanting students to join their projects demonstrate a need to expand the oral health care workforce within the NGO sector as there are very few oral health workers volunteering their services. This is further supported by van Palenstein Helderma, who reported that the dental NGO sector is very small with a maximum of 500 dental NGOs worldwide.¹³ By getting students involved in such projects on an ongoing basis, creates a substantial workforce year after year, contributing towards the long term sustainability of NGO projects in the province, leading to better oral health outcomes of communities.

Adapting to a community-based setting

The participants believed that students could benefit by meaningful engagement with communities through real-world experiences, learning to work with available resources and a chance to develop non-technical skills (Table 3).

Table 3: Adapting to a community-based setting

Prospects	Participants’ responses
Real-world experience	<p>‘It gives them exposure to the outside world not only being in the classroom or being on campus. At campus you may be able to see all the theoretical things, and on the outside, in the field you are seeing practical work where you would see many diseases that you may not physically see at your place of study.’ (P4)</p> <p>‘In the rural areas they have got an opportunity of learning more and getting an experience with different rural communities. I did my primary health care at a rural area and I got that experience.’ (P1)</p>
Learning to work with limited resources	<p>‘I can improvise when I am in the community because I know that I will not be getting everything I’m used to, but to get a person healed or cured</p>

	or get him some help, you need to work with what you have. So that is why I say when I am there, I go to the level of the people.’ (P1)
Developing non-technical skills	‘I would just like these students to be committed and dedicated to the work and to be able to follow the ethos that is there. We would like patients to be treated with absolute kindness, respect and understanding.’ (P6)

Students engaged in community-based training gain meaningful learning experiences. In addition in improving clinical skills in community settings, students are also exposed to pathology that they normally don’t encounter in the hospital setting. These pathologies are often observed due to patients delaying seeking affordable dental treatment. Students also learn to adapt to different work environments with limited resources. This provides them with a good learning experience, as not all work environments are like the ideal training site with all the latest equipment and materials that they are used to.

Students also have opportunities to develop non-clinical skills such as learning to treat a patient with respect, compassion and care irrespective of their background. In doing so, they will be attaining graduate competencies of being a caring health professional who communicates well with patients of different cultures, which the institution advocates. This type of learning is explained by the experiential learning theory that supports students being directly involved in the learning process instead of passively imbibing information from the lecturer.¹⁵ Learning is directly linked to the activity performed by the student, the context and culture in which it occurs and the interaction with peers and the community. In this way, learning is situated and not abstract.¹⁵ This is further supported by a study conducted among dental students who participated in NGO projects reporting that they had opportunities of putting into practice the theory they learnt in school, improving their dental skills and seeing real-life cases away from an academic setting and networking with professionals in the field.¹

Developing social responsibility

Through participation of community-based initiatives, participants believed that students could gain a deeper understanding of social needs and plights and could develop in them a sense of social responsibility (Table 4).

Table 4: Developing social responsibility

Prospects	Participants' responses
Addressing community's needs	<p>'Oral health and oral hygiene is vital and is really needed in this community. Dental students can do dental screening, can go to schools, do oral health education. A dental program can be conducted during the school holiday but you need to give advanced notice and we can advertise it so that the community is aware of it.' (P3)</p> <p>'There is a real need for dental human resources. If we can get dental students coming in and are supervised, then we can get the patients.' (P6)</p> <p>'They can give oral hygiene education, community service. Oral health education is really needed in this community. Students can demonstrate to them the correct way to brush their teeth and educate them on diseases that affect the teeth.' (P8)</p>
Social accountability	<p>'We just want to give our people that come to our clinic service, bearing in mind humanity. So we give humane services to these people remembering also that there can be no double standards of this care. There cannot be one care for you and your family and another one for the people coming there.' (P6)</p>
Invoking volunteerism	<p>'To come and see what the outside world looks like, to interact with community and see what their needs are. When you get out into society, as a professional, you would also be able to offer that kind of compassion and service to them, maybe not because you want to earn a fat salary, but to have that same love to serve humanity as we do' (P4).</p>

The World Health Organisation (WHO) defines social accountability of institutions training health professionals as an obligation to direct their education, research and service activities towards addressing priority health care needs of communities and nations.¹⁷ Exposing students to NGO projects in communities, allows the institution to achieve its goal of being more socially engaged. It exposes students to the realities of rural communities and the need for oral health services. This may inspire students to want to service these areas upon graduation. This is further supported by Hood who reports that when students participate in community-based programs, it increases the number of graduates to stay in rural, underserved areas to practice.¹⁵

Participation in NGO projects inculcate in students a sense of giving back to community by volunteering their services in these NGO projects. By participating in such projects, they learn how to conduct such projects and can also inspire them to initiate this in their communities or communities where they see a dire need for health services. This is supported by a growing consensus within the dental profession that its members have a moral responsibility to serve the public good by providing expert dental care to all in need.⁵ However, it is an unrealistic expectation of a qualified dental professional to consciously provide care for the underserved or under privileged if this was not given any importance in their training. Thus, by providing opportunities for students to participate in NGO projects, values of humanitarianism and professionalism are instilled in them.

Theme 3: Support provided

Participants reported that they could provide support such as an enabling environment with mentorship, transport and sustenance (Table 5).

Table 5: Support provided for student training

Support	Participants' responses
Student safety	'If they need our help, we will orientate them and help them where they need. Where their safety can be a problem, we will phone we keep connected to each other and then we know lets us not go we will tell you when to go. We do not also go in the community if there is unrest.' (P1)
Transport and sustenance	'Providing transport to students to and from the health expo. Provide them with a meal.' (P2)
Professional support and guidance	'We also have the professional personnel to backup if there are complications such as breakage or crack, the professional will be there to extract it and relieve the issue or symptoms of the patient.' (P4)
Mentorship	'Senior medical/health care professionals could attend the events and provide guidance and advice to students. The content comes from senior students who have attained knowledge from academic and skills training.' (P7)
Enabling environment	'We provide a platform for all health care students to participate in this initiative.' (P7)

The participants were willing to provide support in many ways to assist students. While some were prepared to provide support, others regarded this as a barrier to student participation. An enabling environment is very important for active student learning. This is further supported by Gordon who confers that a supportive environment is essential in building clinical competencies in students. ¹⁸

Moreover, these projects can make a real difference in communities if they are supported by the local health systems, coordinating their programs with that of the health system through a small ongoing partnership. In this way, there could be sharing of skills, personnel and resources as volunteers on the ground assist public health care workers by reducing the daily patient load and, through sustainability, strengthen the health system. ¹⁹

Theme 4: Creating interprofessional learning opportunities

Every participant reflected the need for students from other disciplines to join their program (Table 6).

Table 6: Creating interprofessional learning opportunities

Opportunities	Participants' responses
Need for rehabilitation services	'We also need physiotherapists in the community because we have many children that need to be rehabilitated.' (P1)
Holistic patient management	'In order to provide holistic care, I would appreciate it if other health care disciplines such as optometrists, physiotherapists, occupational therapists to come on board, but to get people to come out over the weekend is difficult.' (P2) 'We would like to collaborate with many other health care disciplines such as optometrists, physiotherapists, occupational therapist in order to provide holistic care.' (P7)
Patient screening	'There is dire need for eye testing, so optometry students are most welcome maybe both eye and dental clinics can be conducted on the same day.' (P3) 'Optometry students are also needed. They can come to schools and conduct eye tests and refer some patients back to the eye clinic in the main hospital.' (P1)
Sharing the workload	' We are looking, for pharmacists, because normally we have two pharmacists wanting to serve 150 patients or 200 patients but if we have junior pharmacists,

	student pharmacists who want to volunteer their time and effort then obviously they are welcome to do so.' (P4)
Joining an existing program	We do have an eye clinic which is run by an Optometrist who comes in every 2 nd Friday, so optometry students are welcome to be a part of this. We get pharmacists who come from RK Khan Hospital (local hospital) to dispense medication here - pharmacy students can also benefit and learn from this. (P5)
Restarting discontinued services	<p>'We started a program with physio and optom students, optom is continuing but with physiotherapy, it could not be sustained because of lack of manpower. With Occupational Therapy also, there was lack of manpower. I would really love it if physio continued with optom.' (P6)</p> <p>'We have also had students from the eye clinic to come and help us, service us but unfortunately some of our projects have faded away but we want to reintroduce this eye clinic and try and make a success where students can get an exposure to serving the communities.' (P4)</p>
Job opportunities	'Optom, we really need the services of optom students, there is also job opportunities for newly qualified optometrists.' (P9)

Interprofessional education (IPE) occurs when two or more health professional students learn with each other in educating and managing patients.²⁰ Combining community-based training and interprofessional learning is the ideal and is a growing trend in education institutions.²⁰ By NGOs indicating the need for services of other health professionals emphasises the need for health professionals to work together for the benefit of society. Thus, the NGO projects provides a platform for all health professional to learn to work effectively in interprofessional teams. However these opportunities need to be created by academics from individual disciplines who have acquired humanitarian values.

Theme 5: Perceived barriers

The participants agreed that there were some barriers that could hamper student participation (Table 7).

Table 7: Perceived barriers

Possible barriers	Participants' responses
Transport	<p>'We also use one transport, we share the transport with others from the hospital and there may be no or limited space for students. (P1)</p> <p>'Transport has been a huge barrier to participation – as it's difficult to get a large group of people to and from the venues. The health care faculties are located on different campuses and have different term times which impacts collaboration. Our events are held over the weekend which limits student availability/participation.' (P7)</p> <p>'The funding for travelling and sustenance of these students would not be part of our funding.' (P9)</p>
Student attitude	<p>'The students need to be community orientated. Sometimes you get students but they do not cooperate, because in the community, you have to come down to the level of the people and their working conditions are not like in the institutions.' (P1)</p> <p>'I would not want smoking in there and I would not want people sitting there and laughing at each other or be on their cell phones and coming there to think that it is a holiday.' (P6)</p> <p>'Students must learn to treat patients with compassion and respect.' (P5)</p>
Concerns about student capabilities	<p>'I am sceptical about allowing students to actually work on patients- doing tooth extractions. We cannot let students work on patients - we want only people who are qualified to work on patients.' (P8)</p>

In this study, it is noted that transport to where the NGO projects are occurring is a huge barrier. These NGO projects can be beneficial for student health care professionals and the institution. Therefore, the institution should consider providing support for them.

If students were to participate in these programs, they need to be first orientated and informed about the project and the background of the NGO, so as to develop a good attitude before they commence. It is important for students to realise that volunteering is sharing done with good intention, compassion and concern extended to the less privileged in a respectful manner. Likewise, where NGOs are not sure of student capabilities, they need to be orientated and informed of the scope of practice of a dental therapist.

Strengths and limitations of the Study

The strengths of this study is that it provides data that can feed into planning and implementation of community-based education activities for dental therapy students. It is acknowledged that this study was conducted using only NGOs and private enterprises known to the researcher and restricted to those only in KZN. Another limitation was that the researcher did not interview the health care workers participating in these projects to obtain their views on volunteerism and the challenges thereof. More research is therefore required in this area.

Conclusion

This study showed that there are many community driven initiatives of the private and NGO sectors that could provide situated learning experiences for dental therapy students. In participating in these community projects, students can develop professionally and obtain a deeper sense of social responsibility which can inspire them to volunteer their services to these projects upon graduation or initiate similar projects in other deserving communities.

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5.6 Manuscript 6

Community-Based Education: Experiences of Undergraduate dental students at the University of KwaZulu-Natal, South Africa

This study described the community-based learning experiences of dental therapy students at three different sites; a local community-health centre, a non-governmental dental clinic and a decentralised site which was a regional hospital. Although this was the quantitative component of the research project, involving students completing self-administered questionnaires, the questions were mainly open-ended to obtain descriptive, in-depth information about their rotations with the data being analysed using content analysis and thematic analysis. Another manuscript will be developed on how the students perceived they could achieve the core competencies through community-based training.

This manuscript, however, addressed objective 6 which was to explore final year dental therapy students' experiences of community-based training. This study adopted an action research approach in which community-based sites were first explored and students were then provided with learning opportunities at three different sites. Students participated in community-based training at a local clinic and a decentralised regional hospital within the DoH. In addition students attended a NGO primary health care clinic.

This study yielded positive feedback from students involved in community-based training. Students reported that their experiences led to an improvement in their professional and personal development with a deeper understanding of cultural, social and economic influences on oral health care. They found that the language barrier was one of the main challenges experienced and hindered their communication with patients.

Community-Based Education: Experiences of Undergraduate dental students at the University of KwaZulu-Natal, South Africa

Abstract

Background. Community-based education is a learning strategy that provides meaningful opportunities for students to apply theory learnt in a larger social and cultural context in various community settings. Although the benefits of CBE to health professional students are well documented, to date, there is little evidence describing dental students' experiences in South Africa.

Objectives. The purpose of this study is to describe the experience of CBE by undergraduate dental therapy students in the School of Health Sciences at the University of KwaZulu-Natal documented in their own words.

Methods. This was a descriptive study in which experiences of community-based education among dental therapy students was obtained through a self-administered questionnaire eliciting qualitative data. Ethical clearance was obtained from UKZN.

Results. This study revealed positive feedback from students. Students reported perceived benefits of improved professional and personal growth, a deeper understanding of cultural, social and economic influences on oral health care. They also raised an important challenge of language barrier when communicating with patients.

Conclusion. Experiences of dental students demonstrate that CBE has the potential to provide students with knowledge and skills to enter the workplace with confidence as new graduates. Students can develop a deeper understanding of cultural and social implications on health and disease prevalence. These concepts can make them realise that they have a broader role in society; that of a health professional, educator and advocate. However, these CBE programs can be more effective with proper planning involving key stakeholders that include community and site supervisors. CBE can be further enhanced through adoption of interprofessional collaborative initiatives within a team-based approach.

Keywords: community-based education, dental students, Health Sciences, UKZN.

Introduction

Traditional dental education curriculum is grounded in basic and clinical sciences.^[1] This takes the form of didactic classroom teaching and clinical training in dental school settings with the focus of gaining competency of technical skills through repetitive completion of clinical procedures to meet set requirements. While this type of education leads to mastery in practice of dentistry, it does not fully prepare dental professionals to meet the rigors and demands of a work environment, managing diverse communities with diverse oral health care needs.^[1] Dental schools across the world have undergone major reform in an attempt to link the

education system to the health system by producing dental practitioners that are equipped to provide empathetic, quality, patient-centred care in diverse community settings.^[2]

One of the strategies used, is to integrate Community-Based Education (CBE) into the curriculum. Community-based education is a learning strategy that provides opportunities for students to apply theory learnt in a larger social and cultural context by being exposed to various community settings and adapting to new situations and circumstances.^[1, 2, 3] The benefits of this type of education is well documented in literature. Being exposed to a variety of patients and procedures improves students' clinical, communication and social skills thereby increasing their self-confidence.^[4, 5] In addition, it provides students with powerful clinical opportunities to develop their professional knowledge, critical thinking and problem-solving skills.^[6]

In South Africa, similar reform in higher education is observed due to two main influences: The Council for Higher Education, advocating the integration of community engagement into curricula to bridge the gap between higher education and society.^[7] The Lancet Commission which called for alignment of health professionals' education to the needs of population and the health system.^[8]

The University of KwaZulu-Natal, in its endeavour for reform, offers undergraduate and post-graduate programs that are responsive to community needs in alignment to the institution's vision and mission, namely to be more socially accountable.^[9] The School of Health Sciences at UKZN adopted a Primary Health Care Curriculum which aims to produce socially accountable health professionals with skills and attributes of professionalism, compassion and communication to meet the needs of the health system. The Discipline of Dentistry, located in the School of Health Sciences, currently offers a three year degree in Dental Therapy. The scope of practice for this health professional includes preventive and curative oral health care through procedures such as scaling and polishing, placement of direct restorations and tooth extractions. Within this scope of practice, the dental therapist is well suited to meet the oral health needs of the population of South Africa across public and private sectors in urban and rural settings. Clinical training occurs mainly at a teaching hospital which represents an ideal clinical set-up with the latest equipment and dental materials. However, clinical training can be greatly enhanced if students are exposed to primary health care and rural settings to better facilitate the transition into the work environment upon graduation.

Given this context, the Discipline of Dentistry, now includes community-based education into the program, moving part of the clinical training out of the teaching hospital into community settings in an attempt to make training more fit for purpose. Students currently undergo CBE

at 3 sites (Table 1). Rosters are drawn up so that students are given equal opportunities to attend all sites.

Table 1: The different types of community engagement for Dental therapy students

Site	Distance from institute	Student rotation	Types of treatment performed
community health care centre (site 1)	15km	once weekly starting in 1st semester	Oral health education, patient examination, tooth extractions, referral
NGO primary health care centre (site 2)	25km	once weekly starting in 1st semester	Oral health education, patient examination, tooth extractions, referral
Decentralised clinical platform-regional hospital. (site 3)	200km	Two weeks in the 2 nd semester	Oral health education, patient examination, restorations, scaling and polishing, tooth extractions, referral.

These CBE rotations are different from conventional community-based education that the dental students undergo. Conventional CBE involved students going to schools or old age homes to conduct oral health education and promotion interventions or using a mobile unit, going to disadvantaged communities performing dental procedures as a community outreach program on a once-off basis or over a weekend. Other Universities in South Africa have similar CBE programs where students spend a week in primary health centres conducting health screenings and addressing health promotion issues to improve health outcomes e.g. ‘Kopangang le fodise – United to heal’ project of University of Pretoria. ^[10]

Adult learning theories suggest that learning is more likely to occur in an authentic context.^[11] These structured CBE rotations create real life learning situations where students spend a set time, on a continual basis, treating patients like they would in a workplace. The students are given more independence and are supervised by clinical staff at these external sites. The aim is to expose students to a safe and conducive learning environment in which they can acquire clinical skills under mentorship of clinical staff, learn to work cooperatively with communities and health services and understand the social context of health and disease in three different settings; an urban setting, (site 1) peri-urban setting (site 2) and a rural setting (site 3).

The decentralised site (site 3, Table 1) offers a unique opportunity for student-centred learning. This sustained exposure over two weeks of work experience and living in the community can allow a student to develop both professionally and personally. Professionally, students are exposed to more patients and procedures. Dental diseases do not occur in isolation; both teeth and surrounding soft tissue present with disease in varying degrees. Students can make a diagnosis of various dental conditions on a particular patient and formulate a treatment plan to holistically manage these presentations in primary, secondary and tertiary treatments. Students are thus given a chance to treat the main complaint and give appointments for follow up treatment on the same patient resulting in a more comprehensive management of a patient unlike in the conventional CBE exposure where a patient is seen just once to attend to the main complaint and there is no follow up of the patient. By living in the community, students interact with community members on a daily basis. They share living space with students from different cultural backgrounds, prepare their own meals and take the transport to the hospital on their own. For some students it is the first time away from the comforts of home. Being exposed to living independently can contribute to student maturity, personal development and transition from student to graduate to workforce member. The purpose of this study is to describe the experience of CBE by undergraduate dental therapy students documented in their own words.

Methods

Research design

This was a descriptive study in which experiences of community-based education among dental therapy students in the Discipline of Dentistry was obtained through a self-administered questionnaire. This study was part of a larger research project conducted on community-based education in the School of Health Sciences.

Participants

The total sample of the final year dental therapy students for 2016 was 36. The first and second year students were excluded as they were not involved in CBE rotations. Two students were approached on an individual basis for a pilot study to pre-test the instrument tool. A meeting was held with the rest of the third year students to invite them to participate in the study and an information sheet was given to them to explain the study. Thirty-two students (n=32; 94%) consented to the study.

Data collection

A self-administered questionnaire was formulated to collect the data. The questionnaire survey used a quantitative approach with elements of qualitative research as the questionnaire consisted of open-ended questions (Table 2) to obtain qualitative data regarding the students' experiences of their rotations to obtain more descriptive, in-depth information. This study was conducted in 2016. The questionnaire was administered to students as a class and was done at the end of second semester upon completion of all CBE rotations. Participation was voluntary and was scheduled at their convenience. Ethical clearance was obtained from the Humanities and Social Sciences Research Committee, UKZN (HSS/1060/015D).

Table 2: Student questionnaire

Questions
What do you understand by the term “community-based education?”
What was the most positive aspect of your experience?
What were some of the challenges you experienced?
What did you learn about the community you served?
What are your thoughts on interprofessional community-based initiatives?
What can you learn in collaboration with students of other health professionals?
What Primary Health Care initiatives do you think you can collaboratively work with other disciplines to uplift communities?

Data was analysed using qualitative methods through content analysis to correctly interpret the information to obtain a deeper understanding of the impact of CBE on students. The responses of each student was collated against each question. By reading the responses, themes were identified through establishment of common patterns and connections according to Braun and Clark.^[12] Students were identified as S1-S32 to maintain anonymity and confidentiality.

Results and Discussion

Of the 32 questionnaires that were returned, one was incomplete. The respondents were made of 10 males and 22 females with the average age of 21. From the students' responses to “What is your understanding of community-based education?” it was observed that students recognised that CBE was equally beneficial for both themselves and the community:

‘Educating patients about health care and providing services and being able to give back to the community.’(S14)

‘Education and training that allows the health professional to uplift and build the community in a positive manner.’ (S30)

This reciprocal nature of CBE is noted in the literature. Bean describes community-based education as a “win-win relationship in which students gain an outstanding professional experience while providing care to underserved communities.” ^[5] While some authors argue that the benefits for students outweighs that to the community, ^[13] others believe that communities are just regarded as passive recipients of service delivery by students. Diab and Flack, affirm that for maximum benefits for both parties, communities should be consulted so that learning activities could be aligned to needs of the community that are identified by them.^[14]

In addition, students also realised that they were gaining clinical skills that will assist them for the work environment:

‘Clinical training or education done in the community for student exposure into the real world and helping community.’ (S22)

‘Training that allows students during their academic programme to go out of the university and experience how to work outside the training institute and work in real community, real patients and learn the real feel of the outer/real world.’(S26)

According to Diab, the primary benefit of providing opportunities with real world experiences is making them understand the importance of their training. ^[14]

What was the most positive/fulfilling aspect of your experience of community-based clinical training?

Several themes arose from the data analysis in response to this question, however, they were categorized under four main themes with each theme having its own sub-themes emerging; Self-development, cultural awareness, social accountability and transition into the work environment:

Theme 1: Self-development

The main benefit derived was the awareness of a growth both professionally and personally. Students believed that their clinical skills improved by attending to many patients a day and working without much supervision. This helped them to manage their time better and develop self-confidence while adapting to different work settings. They also noted that it was important to interact with the patient, getting to understand the patient behind a dental problem and showing compassion for their patients they treated. Engaging with patients at this level, made them realise their decision for this career choice and the overall purpose of their profession. (Table 3).

Table 3: Self-development

Sub-themes arising	Student responses
Increased self-confidence	‘Learning new skills; gaining more experience and knowledge.’ (S17) ‘Learning to work independently as there are no supervisors running after you.’ (S9) ‘Because of meeting new patients every day and face different cases, it teaches me to be able to deal with different cases I will come across with after my qualification.’ (S7)
Time management	‘Being able to get quotas quickly and having an easier/quicker experience than the clinic where most aspects are tedious and time consuming.’ (S3)
Adapting to new settings	‘To learn to work in new and foreign environments and to adapt.’ (S32)
Affirming their career choice	‘The responses we get from patients and how good it makes you feel to help others.’ (S14) ‘Knowing the skill I learnt can benefit others.’ (S19) ‘Knowing that I have made a difference in someone’s life and having people happy and smiling because of me.’ (S30)

These results are in line with previous studies that have shown CBE to be a promising pedagogical tool to better students’ personal and professional development, improving competence and confidence levels and gaining experience in treating new patients in new communities. [2, 15]

Theme 2: Social Accountability

Cultural awareness

One of the most positive aspects of students' responses was that students believed that they gained a better understanding of diverse communities and were able to provide culturally sensitive patient care:

'Getting to understand that people are different, understanding the diversity and how people from different places/ communities' respond to different treatments.' (S4)

'Knowing how to communicate with different races of people, knowing more about how cultural differences affect our treatment plan.' (S28)

'Interacting with people of various origins, backgrounds, attitudes, understanding people of all kinds.' (S1)

In the South African context, patients presenting for medical treatment in the public sector often face cultural and language discord as they may be attended to by health care providers who are not of the same cultural background as themselves. ^[16] Being able to accept and understand different cultures is a good attribute to attain as a student and carry through later as a health professional because we live in a multicultural society whose members become our patients. Furthermore, it must be considered that diversity also exists within the student population who are educated in English and may have western and urban views of health care compared to patients they attend to in rural settings. ^[16] This can further complicate the patient-provider relationship. Therefore, being sensitized to cultural diversity can aid in patient rapport and better patient cooperation during treatment. ^[17] It inculcates good ethical practice by honouring patient autonomy and the right to one's own cultural orientation when communicating to health professionals. ^[17] This is further supported by Diab who observed that when students were exposed to different population groups, they display improved cultural awareness and tolerance. ^[14]

Respecting diversity

'Respect the diversity, cultural differences of South African people. Batho pele principles.' (S11)

'The many different communities have a wide range of different cultures. Patient attitudes were different' (S21)

'Respecting different races, cultures and groups-I have learnt that everyone is different and you need to respect it.' (S30)

‘Different communities have different habits with regards to oral health and habits, eg- Chatsworth-(site 2) beetle-nut stains/mobile teeth; Cato Manor (site 1)-difficult extractions.’ (S18)

Cultural competence can be defined as the acquisition and application of awareness, knowledge, skills and attitudes to effectively provide quality health care to patients of different cultural backgrounds in a respectful way.^[16] Over and above the cultural awareness, student have demonstrated respect for cultural differences. Through CBE, students showed they gained knowledge of cultural components of community such as how lifestyles, behaviour and habits of various cultures can influence oral health and disease prevalence in a population. This can initiate a lifelong learning of characteristics of different cultures^[1] which will develop skill, in managing patients of diverse cultures in South Africa.

Deeper understanding of social determinants of health

This study showed that students obtained first-hand experience of social issues that can impact on health and in particular oral health.

‘Getting experience working in different communities with different cultures, socio-economics and more understanding on effect of environment to dentition of surrounding people.’ (S5)

‘I gain a lot of experience for observing the backgrounds, socio-economics status of our needy people that seeking a proper health care service.’ (S11)

Social inequalities

‘That there are many patients out there that are not able to receive primary health care.’(S17)

‘Their socio-economic state, commonly found disease and why it is a problem.’(S26)

‘How to deal with different people based on their needs and socio-economic status.’ (S27)

‘The community has minimal resources.’ (S20)

‘Poor community in education and wealth. (S12)

Sense of social responsibility

‘Getting to serve the community and helping those that do not have access to oral health care- putting a smile on their faces.’ (S25)

‘We as student/future practitioners are able to impart our knowledge to them and provide a service which is needed most.’ (S13)

The observation that students have an increased awareness of social inequalities, gaining access to basic health care and their greater responsibility as a health professional is noteworthy. This illustrates that through this experience, students could expand their appreciation and understanding of the social, cultural and economic determinants that can influence oral health. ^[6] This is further supported by Mofidi that dental professionals in addition to clinical skills should also know about community health issues and have a sense of ethical and social responsibility. ^[2] Students enter the health profession training with ideas of humanitarianism, compassion and wanting to help the underserved, however, Smith and Weaver observed that these feelings dwindle as students complete their training and start working. ^[17] However, they stated that by students engaging in community-based rotations, these attributes of humanitarianism and professionalism are nurtured and increased.

In South Africa, access to health care including basic oral health care is enshrined in The Bill of Rights, ^[18] yet to date, many unserved or underserved communities exist especially in rural areas. CBE exposes dental students to these realities and has the potential in inspiring a deeper sense of social responsibility and advocacy as health professionals later towards improving access to oral health care for all. Moreover, CBE conducted in underserved areas improves access to context-appropriate training for dental therapists and can inspire graduates to return to these areas for work prospects as dental therapists face many challenges in the employment market.

Seeing themselves as agents of change

‘I have learnt that it is important to give back to the community. I have learnt they will always appreciate what you do.’ (S2)

‘Ubuntu’ (doing good for others). (S24)

This study showcases how dental students personalised the problems of communities and are willing to act as agents of change. In the reviewed literature, Yoder raised an important concern: “Do dental graduates internalize an appropriate vision of their role as a health professional in the context of community?” This is not often taught in the dental curriculum, but through CBE in partnership with community, students have a deeper understanding of how community dynamics and challenges relate to oral and general health and realise that they have a broader role to play as a health professional. Creating this awareness in students fosters the desire to be advocates for equitable health care for all communities and oral health promotion. ^[1]

Theme 3: Transition into the work environment

Students indicated that they had an opportunity to learn from different clinical supervisors who shared their expertise with them and mentored them in ways different from the training institute (Table 4). The geographic context of the training and exposure to new clinical supervisors seemed to change students' attitudes toward clinical supervision. Students perceived the learning environment to be more relaxed and supportive in the transfer of skills and role-modelling as opposed to the environment in the teaching hospital where focus of supervisors is on the acquisition of technical skills and not soft skills such as self-esteem. ^[19]

Table 4: Facilitating work transition

Sub-themes arising	Student responses
Seeing clinical staff as mentors	<p>‘Meeting new professionals and people; learning new skills from different professionals.’ (S29)</p> <p>‘Learning new skills from outside dental professionals; observing the different ways in which people work after leaving a training institute.’ (S21)</p> <p>‘Work with different people/ operators with different attitudes- it really helps and it grows you as an individual.’(S26)</p>
Gradual introduction into the health system	<p>‘Ability to learn from other dentists/dental therapists, ability to interact with other hospitals /clinics, ability to see how other places run.’ (S2)</p> <p>‘Working with large groups of patients at the same time.’ (S5)</p>
Feeling valued by patients	<p>‘... helping a patient and seeing their satisfaction with my service or their gratitude for the help they have received.’ (S31)</p> <p>‘The communities appreciate the work done for them by the group’ (S15)</p>

This study revealed that students gained valuable exposure of the work environment; the daily challenges and rewards of managing patients. This is further supported by Strauss who noted that by introducing students to CBE in their formative years of education helps shape their careers and ethical responsibilities towards patients. ^[20]

Supervision of CBE

Students had conflicting views of supervision at community-based sites. Some thought it was good and enhanced learning while others gave negative feedback (Table 5).

Table 5: Student feedback on supervision

Positive feedback	Negative feedback
'I thought it was very helpful- learned a lot.' (S3)	'Some people are very helpful and some aren't.' (S20)
'Excellent, supportive for undergraduate health sciences- help them to gain self- confidence.' (S11)	'Some supervisors were willing to share their knowledge and others did not have a positive attitude towards students.' (S9)
'It was excellent. We had a lot of guidance from our supervisors- if we had any complications, they always showed us how to correct our wrongs.' (S21)	'Depends on individual supervisors, some were hands on and others lacked enthusiasm.' (S16)
'The supervisors are very helpful and friendly, they also help us to think outside the box.' (S27)	'Different personalities, negative perspectives of different clinical supervisors with regard to student competence, not willing to share knowledge or teach students.' (S3)
'It was professional and it was respectful. I benefitted a lot.' (S30)	

Teaching and learning does not only occur at an academic institute.^[1] Skilled teachers can be found in supervisors of CBE sites in the form of clinical staff who can provide effective mentoring and help shape and influence future professionals that will be joining the workforce. However, students need to be informed of expectations of these clinical staff. Likewise, supervisors need to be informed of the level of clinical abilities of students entering an external site. ^[21] They need to be motivated, orientated and calibrated to ensure effective student training.

Challenges experienced

Three main challenges were identified by students:

Communication

The main challenge experienced was not being able to communicate effectively with patients from different cultural backgrounds. The following comments highlighted student frustrations:

‘The main challenge was language barrier between me and my patients. I want to be able to communicate fully but I was unable to.’ (S31)

‘Language barrier was a huge problem with some patients.’(S17)

‘Communicating information in understandable terms.’ (S19)

This is an important issue that needs to be addressed. Not being able to communicate effectively with the patient can lead to untoward consequences. The communities the students visited are mainly isiZulu speaking. The University has put measures in place to support students with this barrier by instituting a compulsory credit-bearing isiZulu module into every degree program. However, a one-size fits all is not the solution - this has to be fit for purpose for each discipline. In addition, as a college wide initiative, disciplines made videos on communication in isiZulu regarding history taking and various treatment procedures. It would be advisable for students to access these videos before going out on CBE rotation.

Resources

Students found working with limited resources at community-based sites a real challenge:

‘Different dental chairs, some cannot be adjusted therefore you have to adapt to not having all equipment and materials we use here at King George (training site).’(S9)

‘The equipment we came across, in most cases the dental chairs, were not working so we had to manipulate our postures to gain access to the tooth.’ (S18)

By noting these, student gained insight of what actually is endured by health professionals working in the public sector. They became more knowledgeable on the organisational structures of the health system, the processes of procurement, ordering consumables and equipment and the delay in obtaining them as well as being able to make the best of available resources to adequately treat patients.

Adjusting to a new environment

While some students were able to adapt easily to various settings, others found it difficult to adjust to a setting that was different from the institute’s training centre:

‘Ability to adapt to the different environment, ability to interact with the others.’(S2)

‘Not being accustomed to the way things are done there.’ (S8)

This highlights the fact that students need exposure to different settings while in training to overcome this challenge.

What did you learn about the community?

By engaging closely with the community, students gleaned a better understanding of their needs. The following themes emerged:

Lack of oral hygiene education

Most students found that communities lacked knowledge on oral health care:

‘Most people are uneducated about oral hygiene and self-care.’ (S1)

‘Their oral hygiene was bad but they were willing to listen to education and instruction given to them.’ (S5)

‘I learnt that they don’t have knowledge concerning prevention of dental diseases.’ (S22)

‘A lot of them were in need of extractions and cleanings which showed they did not have proper education on their oral health. (S25)

‘A lot of oral health education is needed.’ (S29)

This study emphasises the need to include oral health education and promotion into every CBE program. Oral health promotion strategies are identified as a cost-effective means to reduce oral disease burden in local communities in South Africa.^[21] Oral diseases are highly prevalent but can be easily prevented. Thus oral health promotion strategies should include education on prevention of common oral diseases, lifestyle behaviours on consumption of sugars, impact of social habits such as smoking and alcohol on oral health. However, these interventions should be tailor-made according to the needs and resources of each community.

Students’ perceptions of patients

This study showed that there were mixed reactions from communities regarding students treating them (Table 6).

Table 6: Student perceptions of how patients reacted to them

Reactions	Responses
positive	‘They were welcoming - that improved our confidence.’(S5) ‘People are extremely grateful.’(S16) ‘Patients are more appreciative.’ (S28)

negative

‘They are more demanding when it comes to treatment and they don’t come in on time for their appointments.’ (S7)

‘They expected service-they did not really want students working on them.’ (S13)

An important lesson learnt from this study is that engaging with the community before implementation of CBE is imperative. This is however currently not happening. This can be implemented by meeting with community leaders and explaining students’ presence and function before the start of student rotation. This is further supported by Diab and Flack who indicated that communities feel undermined when not informed about student training and that there should be a formal plan of student activities outlining expectations of both communities and students that must be communicated to them before commencing any student activities. ^[14]

Perspectives on Interdisciplinary collaborations

It is well documented that CBE becomes more meaningful if there is interdisciplinary participation where maximum benefits for communities can be achieved from being exposed to different health care professionals on the same platform. ^[22] Part of the student questionnaire also included questions regarding interdisciplinary collaboration. Respondents were very positive: The following themes showed how students thought they could benefit from collaboration (Table 7).

Table 7: Perspectives on interdisciplinary collaboration

Themes arising	Student responses
Respect for other professionals	‘It is a good initiative as it helps us value other health professionals.(S27) ‘New ways on improving one’s ethical skills. Being able to respect the other more.’ (S17) ‘It is very interesting to meet students of other health professionals and learn some stuff about their professions.’ (S21)
Showcasing their own profession	‘Not many people understand the dental therapy professional.’ (S9)
Holistic patient care	‘...to look at a patient holistically and not in compartments.’ (S6) ‘The better understanding of your patient outside of your profession- we can manage to treat patients holistically and not just oral health.’ (S29) ‘How to effectively treat patients correctly and manage them correctly to ensure overall health of patient is restored or maintained.’ (S32)

Knowledge transfer and skills sharing	<p>‘We can learn a lot from each other - we can share skills and knowledge.’ (S1)</p> <p>‘Different social skills and academic skills.’ (S14)</p> <p>‘Gaining confidence, experience and skills’(S11)</p>
Patient referral	<p>‘So you know who to refer your patient to and also have a relationship with other health professionals.’ (S6)</p> <p>‘When I treat a patient who may need other treatments from other health professionals, I would like to refer them and vice versa.’ (S32)</p>
Community upliftment	<p>‘..a great idea to work hand-in-hand with others to help in the community.’ (S21)</p> <p>‘To enhance their standard of living.’ (S6)</p>
From individual to team approach	<p>‘We can learn teamwork and to get along as we will be working with others after graduation.’ (S25)</p> <p>‘Good opportunity to learn their experiences and as a whole, the College of Health Sciences are brought together. (S17)</p>

Collaborative IPE Activities

In response to what collaborative activities can be initiated, the following suggestions were made:

‘Helping with screening of patients, referring them to get dental treatments and give oral health education and education on health as a whole.’ (S4)

‘Health awareness, education programs, making people aware they are not alone and how to prevent serious illnesses. (S6)

‘Allocate one day in a month where campaigns of all health professional are present and treat individual patients holistically from head to toe.’(S12)

‘Health promotion-outreach programmes.’ (S13)

‘Outreach programmes to educate patients on prevention.’(S17)

‘Eye screening clinics, HIV clinics, counselling services.’ (S18)

‘Mobile clinic for screening and referrals to appropriate health institutions.’ (S24)

‘We can all have the health departments come together to go to different communities and help them.’ (S25)

‘Working together in small clinics that offer all services.’ (S27)

‘Primary health care promotion.’ (S30)

These ideas of interprofessional collaboration demonstrates the ability of dental students to think broadly, using a team-based approach to address major health issues of communities. This facilitates students understanding of the integration of oral health into general health and holistic patient management. It can also develop them into becoming future drivers of interprofessional initiatives in the work environment.

Strengths and Limitations of the study

This study provided a better understanding of how students respond to different training platforms. These documented experiences can feed into curriculum review and planning. A limitation of the study is that it was conducted at a single tertiary site which can affect its generalizability.

Conclusion

Experiences of dental students demonstrate that CBE has the ability to provide students with knowledge and skills to enter the workplace with confidence as new graduates. By moving clinical training from dental teaching hospital into community settings, students develop a deeper understanding of cultural and social implications on health and disease prevalence. These concepts make them realise that they have a broader role in society; that of a health professional, educator and advocate. However, these CBE programs can be more effective with proper planning involving key stakeholders including community and site supervisors. CBE can be further enhanced through adoption of interprofessional collaborative initiatives with a team-based approach.

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5.7 Manuscript 7

Case study: An Interprofessional Community-Based Collaboration between the Disciplines of Dentistry and Physiotherapy at the University of KwaZulu-Natal, South Africa - students and staff perspectives

This study described the views of students, staff and patients regarding an interprofessional collaborative initiative involving the Disciplines of Physiotherapy and Dentistry. It used focus group discussions and interviews to collect the data.

This study addressed objective seven of the study which was to determine the attitudes and perspectives of undergraduate Dental Therapy and Physiotherapy students participating in an interprofessional community-based health education programme. It used an action research approach to create and facilitate an opportunity for interprofessional collaboration, which was then evaluated through feedback from the participating students. By getting students from different disciplines communicating and collaborating with each other demonstrated students' readiness for participation in interprofessional interventions. This manuscript also linked to the main aim of the study.

The students participating in the study, believed that by working with each other, they developed an improved understanding of the other professional in the health team. Staff perceived that it created a good opportunity for students to break down professional barriers and to work cohesively together in the work environment. The community had an increased awareness of available health care services and felt that the IPE intervention improved their

health knowledge. The main challenge, however, was finding a common time for interprofessional activities.

A Case study: An Interprofessional Community-Based Collaboration between the Disciplines of Dentistry and Physiotherapy at the University of KwaZulu-Natal, South Africa - students, staff and patients perspectives

Abstract

Background. Preventing disease and promoting health calls for interprofessional collaboration of health professionals working in a team, making it important for student health professionals to experience collaborative teamwork while in training, rather than working in silos.

Objectives. To describe the opinions of students, staff and patients regarding an interprofessional community-based initiative involving the disciplines of Physiotherapy and Dentistry at the University of KwaZulu-Natal.

Methods. This was a case study using interviews and focus group discussions to obtain participants' views on the joint health education and oral health education talk given to patients at a local community health centre. Three focus group discussions were held with purposively selected samples: the first being five physiotherapy students; the second being six dental therapy students and the third being two academics (one from each discipline), three dental and one physiotherapy clinical staff from the Community Health Centre to obtain their views on the joint health education and oral health education talk given to patients there. In addition, five patients, present at the talk volunteered their views on the student-centred health education talk. The data was analysed using thematic analysis. Ethical approval was obtained from UKZN.

Results. Four main themes emerged from the data: understanding the IPE intervention, impact of the collaboration, difficulties experienced and perceived obstacles to sustainability. The students believed that by working with each other, they learnt more about the other health professional and their respective roles in the health team. Staff believed that this created a good opportunity for students to break down professional barriers and to work cohesively together in the work environment. The community had an increased awareness of available health care services and felt that the IPE intervention improved their health knowledge. The main difficulties encountered were the language barrier and rigid timetables.

Conclusion. This study demonstrates that interprofessional intervention could yield positive outcomes on both the participating students and the community, emphasising the importance of interprofessional collaboration.

Keywords. Interprofessional collaboration, health science students, benefits, challenges.

Introduction

There is growing support in the literature regarding the effectiveness of community-based approaches for improving the health of individuals and populations, ^[1] specifically if they include health promotion interventions. In addition, culturally-appropriate, community-based oral health promotion initiatives may lead to measurable improvements in oral health, ^[2] making it important to include this component with general health care promotional activities. Preventing disease and promoting health calls for interprofessional collaboration of health professionals working in a team, ^[1] making it important for student health professionals to experience collaborative teamwork while in training, which commonly occurs in silos.

Interprofessional education (IPE) is when students “from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.” ^[3] IPE provides opportunities to build relationships, interconnections and interdependence to ensure a patient-centred approach where team members offer services, education and coaching to obtain optimal patient results. ^[4] In so doing, there is a transition in service delivery from a fragmented to an integrated approach where patient care is comprehensive and tailored. ^[4] Educational institutes play an important role in providing opportunities for student health professionals to create a foundation and gain exposure to interprofessional collaboration before entering the workforce. ^[5]

The College of Health Sciences, of the University of KwaZulu- Natal has a broad mix of health professional students including Doctors, Nurses, Physiotherapists, Occupational Therapists, Optometrists, Pharmacists, Audiologists, Dental Therapists, Speech-Language Pathologists and Sport Scientists, which provides a unique opportunity for shared learning. Clinical training in these disciplines occur at campus clinics and designated off-campus sites. Although community-based education (CBE) is fundamental to most disciplines in Health Sciences, it is often practiced independently. While interprofessional collaborative projects occurs with a few of the disciplines at a primary health care centre the Discipline of Dentistry has not been included indicating a need for such an opportunity.

The Disciplines of Physiotherapy and Dentistry both conduct community-based clinical training for their third year students at a nearby Community Health Centre (CHC). The physiotherapy students' scope of practice includes assessing and treating human movement disorders to restore normal function in adults and children using skilled hands on therapy such as mobilisation, manipulation, massage and individually designed exercise programmes. They also prevent recurring injuries and disability in the workplace and at home and promoting community health for all age groups. The physiotherapy students participate in groups of six for a five week rotation, on a daily basis for four hours. At the site, their activities include managing patients in the physiotherapy department under supervision, providing health education, promotion, and group therapy session, undertaking a community-based and visiting outlying clinics and homes. This is a well-established, ongoing community project, with the key role players being academics of the Discipline of Physiotherapy who have been collaborating with the management staff of the CHC since 2009.

The Discipline of Dentistry trains dental therapy students whose scope of practice includes preventive and curative oral health care through procedures such as dental examinations, diagnosis of common oral diseases, scaling and polishing, placement of direct restorations and tooth extractions. Part of the duties include oral health education and promotion on an individual and community level. As part of a community-based initiative, the dental therapy students started attending the clinic in 2016, eight students provide service once a week for four hours. Students rotate each week so that all students are exposed to the community-based clinical training. Their activities include oral health education to the patients and working under supervision in the dental department performing procedures such as clinical examination, diagnosis, tooth extractions and referral. Students from both disciplines are accompanied by an academic who monitors their activities closely with clinical supervision, being provided by both academics and clinical staff from the CHC.

The researcher, an academic from the discipline of dentistry, seeking an opportunity for interprofessional collaboration, approached the academics from both disciplines to initiate a joint project, to which they agreed. An IPE intervention occurs when members of more than one health care profession learn interactively together, to improving collaboration between the professions and the health or well-being of their patients/clients. Interactive learning encourages active student participation and engagement between students from the different professions. ^[6]

The researcher and the academic from Physiotherapy, took on the roles of drivers and facilitators, and provided a simple framework for an IPE intervention. The framework

consisted of the students following a step by step process of doing a needs analysis of priority health problems in the community, and then, deciding which one to address and, designing and implementing an IPE intervention that will help solve them. The project would then be monitored and evaluated by the academics (Figure 1). The students were approached as a group and the plan explained to them, after which, they interacted with each and planned their intervention.

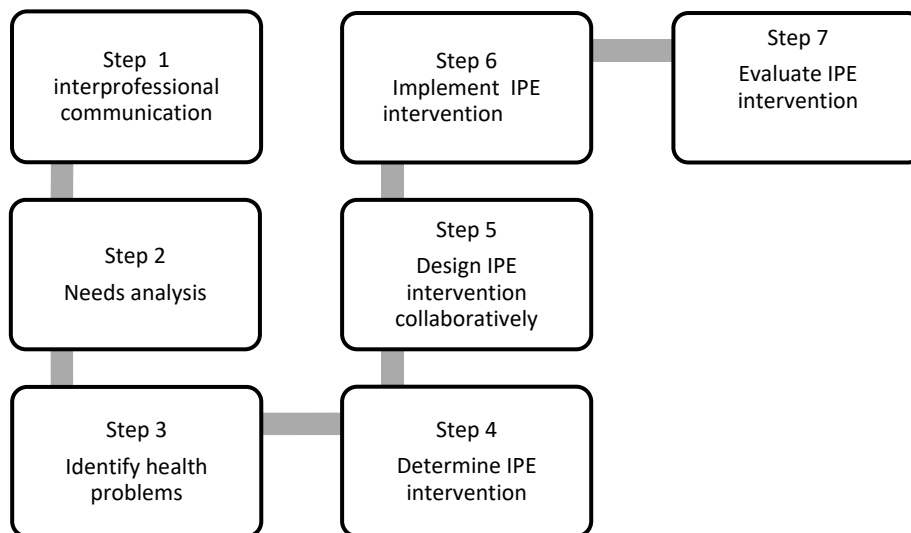


Figure 1: Framework for the IPE intervention

This study therefore describes an interprofessional initiative involving dental therapy and physiotherapy students in the School of Health Sciences, University of KwaZulu-Natal, with the intention of promoting teamwork and interprofessional collaboration among the students, academics and clinical staff.

Methods

Research design






This case study, conducted in 2017, was part of a larger study on CBE in the School of Health Sciences. Ethical clearance was obtained from the Humanities and Social Sciences Research Committee, UKZN (HSS/1060/015D1).

The IPE intervention

Health education forms an important part of health promotion activities and can be defined as a constructive opportunity for improving knowledge and life skills conducive to individual and community needs through some form of communication. ^[7] It is conducted at schools, workplaces, clinics and communities. ^[7] The settings approach is being widely adopted for health promotion as it contextualises health education topics to the needs of specific communities. ^[8] The primary health care setting can be viewed as an effective means of reaching a large portion of the community including pregnant women, young children and patients with chronic diseases.

The students from the two disciplines worked together as a team and designed and implemented their educational intervention. The students from the two disciplines collaborated with each other to undertake an IPE intervention following the steps outlined in the framework (table 1).

Table 1: The IPE Intervention

Step 1 Interprofessional communication 	The students introduced themselves to each other and planned the way forward. As they are not in contact with each other often, they created a group chat using social media for the purpose of communicating with each other.
Step 2 Needs analysis 	The students conducted a needs analysis by interviewing patients who attended the clinic and the nursing staff.
Step 3 Identify health problems 	Main health problems were identified for example dental caries with many patients requiring tooth extractions. This was supported by observing the long queues for tooth extraction everyday outside the dental clinic.
Step 4 Determine IPE intervention 	Students decided to conduct health education covering topics on general health and oral health talks to patients while waiting to be attended to.
Step 5 Design IPE intervention collaboratively 	One group of physiotherapy students decided they would address personal hygiene during pregnancy. Three students were involved with preparation of the talk while the other three made a chart with pictures to supplement the talk. The dental therapy students planned a talk on oral health care during pregnancy and use a demonstration model as a visual aid.

Step 6 Implement IPE intervention	The students introduced themselves to the patients and sought permission to address them. The physiotherapy students spoke first about general antenatal hygiene and the effects of not practicing proper hygiene, basic sanitation and overall alertness of the soon-to-be mother and her baby, making frequent references to their visual aid. The dental therapy students spoke on oral health care and, demonstrated tooth brushing and flossing techniques using the model. They also included care of the new-born and prevention of nursing bottle caries. As most of the patients attending were isiZulu speaking, the students conducted the talk in both English and isiZulu languages. After the talk, the students had a question and answer session.
Step 7 Evaluate IPE intervention	Evaluation was on two levels; firstly the student had to evaluate the success of the intervention through feedback from the patients. Secondly, the students had to be assessed on the project. The physiotherapy students were assessed using oral case presentation and the dental therapy student using portfolio evaluation.

After the IPE intervention, the researcher conducted the research to determine the perspectives of students, staff and patients regarding the IPE intervention.

Participants

The researcher used a purposive sampling method to select the study sample which consisted of students, academics, clinical staff and patients. During 2017, 50 physiotherapy and 36 dental therapy students were registered for their third year. However, the student sample population consisted only of those students who participated in the CBE rotation at the CHC from March to May, this being 18 physiotherapy and 24 dental therapy students. The two academics, one from each discipline who accompanied the students to the site, and the four clinical staff supervising their training from the two departments in the CHC, were all included. In addition, five patients who were present for the health education talk were also part of the study sample. The researcher addressed all the patients in the waiting area and requested five volunteers to participate in an interview after the presentations. The researcher approached each participant individually with an invitation to participate in an interview after the presentations with the 22 participants being indicated in Table 2. Informed consent was obtained from all participants.

Table 2: Study population

Participant	No	Role of participant
P1- P6	6	Third year dental therapy students
P7- P11	5	Third year physiotherapy students
P12	1	Academic: Discipline of Dentistry
P13	1	Academic: Discipline of Physiotherapy
P14 - P16	3	Dental clinical staff
P17	1	Physiotherapy clinical staff
P18 - P22	5	Patients attending the CHC
Total	22	

Data collection

After the IPE activity, the researcher recruited the participants through individual personal invitation. The researcher facilitated two student focus group discussions, one from each discipline, each lasting approximately 60 minutes to obtain feedback on their perceptions of the interprofessional collaboration. The first was with five students from the Discipline of Physiotherapy, and the second, the six students from the Discipline of Dentistry using a set of leading questions to guide the discussions. These questions related to their experience and how the collaboration contributed to their self-development (Table 3).

A third focus group discussion was facilitated with the academic and clinical staff to obtain their perspectives of the collaboration. A separate set of questions were developed for the staff and included their opinions on the collaboration and how this would benefit students and patients (Table 3).

Table 3: Focus group questions

Focus group questions for students	Focus group questions to staff
What do you understand by interprofessional education? Why do you think it is important for you? What did you know of the other profession before you collaborated with them? What IPE activity did you participate in? How did this benefit you as a professional?	What is your opinion of this Interprofessional collaboration? How do you think this will benefit the students? How do you think this will benefit the community? What are some of the activities do you think students could do collaboratively?

<p>How do you think this will benefit the community?</p> <p>What were some of the challenges you experienced when you conducted this activity?</p> <p>How will this benefit you as health professionals in the future when you start working?</p>	<p>From your experience, what are some of the topics you think they should cover in their integrated health education and promotion talks so that the community can really benefit?</p> <p>What are some of the barriers you perceive may hinder the sustainability of this collaborative work?</p>
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Further to the focus group discussions, interviews were conducted with patients to obtain a better understanding of their perspectives of a student-based intervention. As most of the patients' first language was isiZulu, the researcher trained one of the isiZulu speaking dental students to conduct the interviews with the patients in isiZulu. Sample questions included; what is your view of the talk you received? Was the talk clear and understandable? What did you learn from this talk?

The focus group discussions were audio-taped, with a research assistant transcribing the data verbatim, which was then cleaned. Another research assistant transcribed the patient audio-taped interviews and translated the isiZulu transcriptions of patient responses into English. A research consultant assisted with the thematic analysis which comprised of data coding to identify particular features of the data set. Data was then sorted, allowing main themes and sub-themes to emerge from the respondents' statements according to Braun and Clarke. ^[9] Credibility, a form of internal validity in qualitative research, was established through the use of varied research methods, namely interviews and focus group discussions to collect the data. Transferability relates to external validity and was facilitated through the use of purposively selected samples and providing a thick description of the context of the enquiry. Transferability was further enhanced by comparing the research findings with current literature. Dependability was achieved through use of a co-coder (research consultant) and confirmability was established through quotations of actual dialogue of the interviewees. Participant confidentiality and anonymity were maintained.

Results and Discussion

Four main themes emerged from the data analysis process: understanding the IPE intervention, impact of the collaboration, difficulties experienced and perceived obstacles to sustainability.

Theme1: Understanding the IPE intervention

Two sub-themes related to the integration of oral health topics into general health promotion and the effects of the intervention will be discussed:

a. Integration of oral health into general health promotion

The following are quotes of students describing the topics covered:

- ‘We went to the pre-natal clinic, the physiotherapy students spoke about the importance of immunisation of their babies and I spoke about diet in their pregnancy and when they should seek dental treatment in their pregnancy. My colleague spoke about importance of breastfeeding and care of new-born’s mouth even though they have no teeth and when the teeth erupt one by one, how they should clean them. We also spoke about nursing bottle caries.’ (P1)
- ‘We went to front reception area, they were talking about cancers, cervical and breast cancer awareness and we spoke about oral cancer.’ (P3)
- ‘The physiotherapy students spoke about immunisation against disease and the importance of vaccination – something we felt they didn’t know much about because the mothers just know that they must take care of their children and they must go for vaccinations – they just know how to because they were told to do so but they did not know why they have to. When the dental students covered oral hygiene, it’s nice because they now know other ways to look after their children like oral hygiene which some people just take lightly.’(P9)
- ‘We spoke about awareness of breast cancer and it was good that the dental students also spoke about oral cancer and social habits like smoking can lead to oral cancer.’ (P10)
- ‘The talk that we did, discussed the importance of antenatal hygiene and the effects of not practicing proper hygiene. It emphasized the importance of oral care, basic sanitation and overall alertness of the soon-to-be mother’s surroundings. (P11)

Health education forms an essential component of student training. Early exposure to community settings familiarises students with the culture of health promotion and disease prevention. However, this should not be done in isolation, but collaboratively with other health professionals for maximum benefits to the community. This study showcases students’ openness and readiness to participate in interprofessional activities. It also demonstrates the ability to decide on appropriate and relevant topics pertinent to specific target audiences.

Furthermore, this initiative sets oral health promotion in the broader context of general health promotion and highlights the need for a multi-disciplinary approach to achieve better health outcomes of communities. The commonality of risk factors for oral diseases and general health diseases is demonstrated and emphasises the need to include oral health as a topic in general health promotion and disease prevention strategies. ^[10] This study shows the effective integration of oral health topics into general health promotion topics as observed when students spoke on personal hygiene for pregnant women, the dental students spoke about oral hygiene during pregnancy and extended it to oral health care of the new-born.

b. The effects of the IPE intervention

The feedback received from the patients indicated that the intervention created an increased awareness among the recipients. The following are quotes from the patients:

‘I did not know that even if a new-born baby has no teeth-we must still clean the mouth.’ (P18)

‘Even if there is one tooth we need to still clean.’ (P19)

‘I learnt how to check for any sores in the mouth and where to look for it’ (P21)

‘I learnt that putting snuff in your mouth is bad for you and can lead to cancer.’ (P22)

‘I learnt why we need to immunise our babies.’ (P20)

The intention of the initiative was to increase awareness and knowledge of the patients. Effectiveness of an educational initiative is dependent on certain criteria such as addressing the needs and interests of the target population, being culturally appropriate and delivered in a way that is easily understood. It must also be able to improve knowledge to inform lifestyle habits. ^[8] This initiative met these criteria through delivery of health education topics tailored to the needs and interest of the target audience in both English and isiZulu so that they were easily understood. This is further supported by the positive feedback received from patients. Improving access to health information should lead to patients using this information to promote and maintain good health. ^[8] However, this remains to be seen as long term outcomes.

Theme 2: Impact of the collaboration

The study showed that the collaboration impacted positively on both the students involved in the intervention and the community receiving the intervention. This is seen under the following sub-themes:

a. Benefits for student education

Several positive influences arose from the collaboration of dental therapy and physiotherapy students, these relating to undergraduate learning experiences as well as their professional development. Their undergraduate influences ranged from gaining a better understanding of

each other's profession, increasing their knowledge by learning from their peers and learning to work in teams as illustrated by the following students' quotes (Table 4):

Table 4: Students' education benefits

Sub-themes arising	Participant's response
Understanding the role of the other health professional	<p>'I thought they just do massages but when we were doing the whole patient education talk, I was definitely opened up to whole different idea of what physiotherapy is all about.' (P1)</p> <p>'I know now that it's about rehabilitating the patient without any medicines.' (P2)</p> <p>I didn't know what they can do. 'I just know they deal with teeth.' (P7)</p> <p>'After collaborating, I learnt the specifics as in how to floss, when to use mouth wash and also the correct way of brushing your teeth.' (P11)</p> <p>'I know now that they can work with CP patients and can make special stuff for them like special toothbrushes that can help them brush their teeth.' (P9)</p>
Appreciating the other profession	<p>'We learnt more about the other profession.' (P3)</p> <p>'We learnt to respect the other profession for what they are doing.' (P5)</p> <p>'It also helped create awareness of our profession in others. Most other health professionals don't know about the dental therapy profession. By interacting with other students and they can refer their patients to us.' (P6)</p> <p>'When you refer the patient you need to have a good knowledge of how the other professional can help them and if they have some questions, so it is good to have a general knowledge of the profession you going to refer the patient to.' (P2)</p>
Knowledge expansion	<p>'It helped them to just broaden their knowledge, not to only concentrate on oral health. They need to know how to incorporate oral health into general health.' (P14)</p> <p>'As a professional, when dealing with antenatal mothers I can advise them on their health, hygiene and oral care to ensure proper care in this stage of pregnancy and not only physio based care.' (P11)</p>
Team-based approach	<p>'I think it helped us to learn how to work better as a team.' (P9)</p> <p>'...when we had patients with CP, they picked up the rotten tooth and the abscess.' (P13)</p>

	‘I feel that other professionals are learning more about oral health and when the dental team is not around, they can impart this knowledge and information to patients.’ (P12)
Peer-learning	‘... because of us all working together and whatever they are talking about, we can also learn.’(P7)
Linking oral health to general health	‘I think you able to clearly see the link between the medical/systemic conditions to the conditions that prevail in the oral cavity.’(P1)

b. Students’ professional development

Students could also benefit by building relationships that will influence their professional benefits in providing holistic patient management and making appropriate referrals (Table 5).

Table 5: Professional benefits for students

Sub-themes arising	Participant’s response
Breaking down professional silos	<p>‘It teaches us at an early stage not to isolate ourselves in a way that it is to think only about physiotherapy but to learn to work with other professionals as well.’ (P9)</p> <p>‘They are not working in isolation, so they are bringing everything together which is what we ultimately want.’ (P12)</p> <p>‘It teaches them not to work in silos which is very important because when they finish they can work better in multidisciplinary teams. There has been a lot of studies done to show that it is better to work in multidisciplinary teams while they are still learning rather than trying to forge these relationships after they qualify.’ (P17)</p>
Building relationships	<p>‘I think it creates a relationship with other faculties, helps us to work with them.’(P4)</p> <p>‘We are going to be working with other professionals throughout our careers, so it helps us to forms bonds from now that we can maintain throughout our working careers to ensure that our patients are getting the best treatment that we are able to provide for them everything that they will ever need just by us just knowing about other professions and being connected to others.’ (P6)</p>

Holistic approach in patient management	‘...each discipline works solely on their specialities like we work in the mouth - that is our focus, but when you are incorporating all the different specialities, you are treating the patient holistically.’ (P6)
Appropriate referral	<p>‘It will essentially help with the proper referral of patients. When you see a certain case – you know that this is beyond what you can do for the patient and to refer appropriately.’ (P1)</p> <p>‘I now know to make appropriate referrals for dental therapy as I know the importance of oral care in antenatal mothers.’ (P10)</p>
Future collaborative practice	‘It also gives you a chance to interact with them and when you are out in the working environment, have people that you can go to for different things in managing your patients.’ (P6)
Preventing work related injuries	<p>‘They came to us to talk to us as a class and educate us on proper posture to use when treating patients. They also showed us to do exercises that we as dental therapists need.’(P5)</p> <p>‘They will be able to extract teeth without getting the problems we have by watching their body stance or strengthening their muscles to compensate for the workload to prevent them from getting injured.’ (P16)</p>

From the information obtained, students believed that the collaboration was valuable and they benefitted considerably. They learnt about each other and with each other, developing greater respect for the other profession. By breaking down professional silos, they learnt the value of a team approach in holistic management of patients. This is supported by the reviewed literature which demonstrates that IPE is an effective tool in developing collaborations and improving professional practice among health professionals. ^[11] Moreover, the experience of learning together can break down professional walls, change attitudes and reduce stereotypes among health professionals. ^[11]

They also realised the value of a team approach and the roles of different health professionals in the rehabilitation of cerebral palsy (CP) patients. The rehabilitation team is usually made up of physiotherapists, occupational therapists, speech language pathologists but seldom dental personnel leaving oral health care often neglected in CP patients. The dental therapy students made a significant contribution to the well-being of CP patients with dental examination and appropriate referral for management of a dental abscess. They also educated the parents on oral

hygiene home care for the patient as it is vital for caregivers to become knowledgeable and competent in dental care. ^[12]

By working in a team, they also learnt to link oral health to general health promotion topics. Health promotion in South Africa has evolved from just health education to a comprehensive policy with programmes targeting various health issues including interventions in HIV Counselling and Testing (HCT), tuberculosis (TB) control and awareness programmes, tobacco control initiatives, cancer, diabetes, etc. ^[13] Conducting health promotion activities in interprofessional teams while in training prepare students to become involved in collaborative practice to tackle these major health issues later as health professionals.

Furthermore, undertaking this simple IPE activity, familiarises students with Primary Health Care (PHC) principles. This helps to reinforce the PHC practice in health promotion and disease prevention throughout their educational programme and maintain it by carrying it forward later in the work environment. ^[14]

Moreover, while working in a team, they have established links with the other profession which could develop into professional relationships that they could use later in the work environment to make appropriate referrals. This is further supported by VanderWielen that networking is an important component in interprofessional collaborative practice in holistic patient care. ^[15]

The dental therapy students also realised that physiotherapy students could help them in ways that they did not anticipate, namely to prevent work-related injuries through the practice of exercises. The dental staff at the clinic were all suffering with pain from some form of musculoskeletal disorder (MSD). The prevalence of MSD is well documented in the reviewed literature with a study conducted in KZN indicating more than 80% of dentists participating in the study reported pain in their hands, neck, shoulder and lower back due to clinical work. ^[16]

The study suggested the need for ergonomic work practice while in training to reduce the risks of MSD later in their working careers. ^[16] The present study shows that students are made aware of the risk of MSD through the experiences of the dental clinical staff and should heed the advice and practice the exercises shown to them by the physiotherapy students to prevent MSD in the future.

c. Impact on the community

This study showed that the student intervention could impact positively on the community, by creating awareness of the various health services they have available to them and which could significantly contribute to improving their lives (Table 6).

Table 6: Impact on the community

Sub-themes arising	Participant's response
Creating awareness of the health professions	<p>‘...informing patients of the various services that are available for them and it is not difficult to access as there are people who are coming to the communities to actually provide these services to them.’ (P6)</p> <p>‘.. providing people with services they don’t even realise they need. Often when they are sick they want to go to the medical doctor, they don’t realise there are physiotherapists, dental therapists, occupational therapists and speech therapists.’ (P6)</p>
Improving lives	<p>‘..improving the quality of life for the people of our societies and as a result you are creating a longevity, increased life span of the people.’ (P1)</p> <p>‘When a patient has something like a stroke, lots of people think they just have to sit and suffer, they don’t realise they can go for physio or get help.’ (P16)</p>
Value for money	<p>‘Patients tend to get treatment for one thing at a time. There is much more and they can get much more than what they came for. There are other disciplines to seek help from.’ (P14)</p> <p>‘If you are looking at a PHC facility it is a one stop shop we have the Batho Phele principles – we want to add value and people must get value for money and this is one of the ways we can do this.’ (P13)</p>
Empowering the community	<p>‘...empower people and to take charge of their wellbeing- we want them to be proactive and resolve all the problems before it is too late or you seeing them in hospitals.’ (P13)</p>
Promoting healthy lifestyle	<p>‘They were looking at what the tuck shops were selling. They even watched what the children were eating - so they looked at the dietary aspect. They were promoting more eating of fruits and veggies rather than eating sweets.’ (P13)</p>

In developing countries, IPE activities should adopt a tailored approach aimed at solving the main health problems of a target community. ^[11] This study shows that the IPE activity was planned according to the needs of the community which demonstrates relevance and alignment with current literature. It also demonstrates application of the PHC principles specifically to identifying needs through community participation and implementing interventions, using

available resources, to address these health issues. This is further supported by Ndateba who claims that the approach of first identifying health care problems and validating the needs of communities through appropriate interventions is in line with PHC philosophy. ^[14]

Over and above the IPE intervention, the community benefitted in other ways including being made aware of the different health professional services that they can access. According to one of the participants (P15), patients attend the clinic for one particular health problem, not realising they can access other health services at the same time. This leads to a fragmented approach to health care. From the literature, Nesta reports that teamwork and shared values convert fragmented care to integrated care. ^[4] Through an increased awareness, it is envisioned that the community is empowered to take ownership of their health and prevent diseases by following healthy lifestyles.

Theme 3: Difficulties experienced

The students encountered a few difficulties while undertaking this collaborative project, such as language barrier, lack of patient interest and patients not wanting to change their ways (Table 7).

Table 7: Difficulties encountered

Sub-themes arising	Participant's response
Language barrier	<p>'I do know the language, but when I need to express and explain certain things I find it difficult.' (P7)</p> <p>'We asked them first if we could speak in English, but when we were speaking to them and you look at their faces you can see that the audience really not understanding or absorbing anything and when you ask them if they understand they just agree.' (P6)</p> <p>'when it comes to giving the talk we do it in isiZulu so that patients can understand us.' (P8)</p> <p>'Although I was speaking in isiZulu, not all people understand isiZulu... some people are from Nigeria and some Xhosa speaking who did not really understand isiZulu so there was a language barrier even if we tried to speak in isiZulu. (P1)</p>

Lack of patient interest	<p>‘Some patients are not really receptive to the information and education you are giving to them, understandably so because we grew up differently, our backgrounds are different, our beliefs are different.’ (P1)</p> <p>‘Patients not wanting to answer your questions- they just look at you.’ (P10)</p>
Too much information to take in	‘I think some patients were overwhelmed because we were there for a short time and we wanted to give them as much information as we could- it was like information overload for them.(P6)
Resistant to change	‘just because you are educating someone doesn’t mean that they are going to change their minds.’ (P1)

The main difficulty experienced in the present study was the language barrier. Most members of the community were isiZulu speaking. Student grouping consisted of a good mix of students from diverse cultural backgrounds and ensured that the health educational talks were presented in both English and isiZulu. This is further supported by the literature, which reports effective communication between health care provider and patient is regarded as fundamental in providing quality health care which leads to patient satisfaction and health improvements through acceptance, compliance and cooperation. ^[17] Three main barriers have been identified by Schyve that hinder this complex process of effective communication which are language difference itself, cultural differences associated with the language barrier and thirdly, low health literacy. ^[18] To overcome these barriers, Schyve proposed engaging the services of an interpreter. ^[18]

An important lesson to be learnt from this study is to limit the amount of information given to patients. This should only be the most important facts that students want patients to remember and take home. In the focus group discussion, one student suggested that pamphlets should be made for patients to reinforce information given to them, to take home and read at their leisure. Students should also stimulate more interest in patients by getting them more involved in the activity as reported by another participant who suggested allowing patients to first demonstrate how they brush their teeth or wash their hands at home for example, and then students could point out their faults by demonstrating the correct way. They will remember this when they are at home in the community. In this way, they may be motivated to change their behaviour and habits.

Theme 4: Perceived obstacles to sustainability

Participants of the study noted that barriers such as rigid timetables that not allow for interprofessional collaboration, funding and sustaining the collaborative project (Table 8).

Table 8: Perceived obstacles

Sub-themes arising	Participant's response
Timetable scheduling	'Dental students come here once a week and students alternate every week so that all students get an exposure, but Physiotherapy students come here as a group for a 5 week block. So if we want them to do something collaboratively there are different students every week.' (P12)
Funding the project	'As much as budget is a problem, it is not impossible, students must go out there and get sponsors. There are a lot of businessman out there that are willing to do community service from their business aspects.' (P14)
Group conflict	'..attitudes of students in terms of one wanting to lead the team. They will learn that we are all here to serve the community, we all know the roles we have to play, there is nobody here who is more important than the other.' (P17) 'Students were not used to working with other students. They also have other demands such as they may have tests when they get back to campus and sometimes the dental students may not finish on time and they get delayed as they share the same transport back to campus.' (P13)
Patient attitudes to students	'I think the attitudes of patients. Sometimes when the students speak to them, some are not really interested. To overcome this, we just have to continue to talk, to educate the patients, to persevere. I tell my students even if they get the message across to one patient - you have achieved something.' (P12)
Sustainability of project	'...when it is exam time, their focus then shifts. We need to have a timeframe in which to start and probably get it up and running before the exam starts and then it will form part of sustainability of the project

as well. It is not just for this year students but also for those coming next year.' (P15)

The obstacles to sustainability found in this study were similar to that found in previous studies. Time and scheduling are major obstacles for implementation of IPE activities as noted by Sungunya et al. in a systematic review.^[11] To overcome this, some academics integrated IPE activities as part of the existing curriculum. Another solution is to make rigid curricula a little more flexible by allowing students to participate with other activities while participating in IPE activities.^[11] To overcome the timetabling barrier in this study, academics from the two disciplines should meet and discuss how they can best integrate this IPE activity into individual timetables to ensure its success and sustainability.

Lack of funding is also an important barrier to initiation and sustainability of IPE activities.^[11] Funding is important for curriculum development, payment of costs and staff training to manage different health professional students and this should be the responsibility of the education institution.^[11] In this study, participants felt that students should also be involved in generating funding for IPE projects. In this way it becomes a more student-centred approach where students plan, fund and implement their own IPE activities.^[11] By taking ownership, enthusiasm and sustainability for the activity will be improved.^[11]

Conflicts arising within the group can complicate IPE. To overcome interpersonal issues within the group, students should be orientated by facilitators on the greater value and outcomes of IPE and students should be encouraged to see all members of the group as equal participants.^[11] Kruger further supports this by noting that students should be prepared for what is to be expected of them.^[19]

Strengths and Limitations of the study

The strengths include the openness and readiness of student health professionals to participate in IPE initiatives. This study serves as a case study to further explore interprofessional collaborative initiatives among the disciplines in the School of Health Sciences. It further illustrates that interprofessional activities can have meaningful experiences for both the students and the community, emphasising the need of IPE. From this study, it is noted that academic staff are drivers of such initiatives and should continue to promote the collaborative culture through creation of more IPE learning opportunities. It is acknowledged that the interprofessional collaboration is limited to only two disciplines in health sciences and the

findings related to the views and opinions of the participants are limited in their generalizability. Further research involving collaborations across more disciplines is required to promote IPE activities within the university.

Conclusion

The study provides a case study to further explore interprofessional collaboration for dental students with disciplines of health sciences. Academics play a vital role in creating and facilitating collaborative learning opportunities. However, smooth implementation necessitates teamwork from academics, clinical staff and participating students. This study demonstrates that interprofessional interventions could yield positive outcomes for both the participating students and the community.

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A Conceptual Framework for Interprofessional Community-based Training for Dental Therapy Students

This manuscript provided a conceptual framework for interprofessional community-based training for dental therapy students. It is linked to objective eight of the research project namely, to develop a conceptual framework guide data collection and data analysis for community-based training for undergraduate dental therapy students. It used a systems approach, in which the two systems, the health and education systems were viewed as sub-systems which needed to link together to produce relevant health care workers with competencies that could effectively meet the health care needs of the population.

It was made up of five components which are dependent on each other to form the framework. The health system informed the education system on the training needs of health professionals. The education system was responsible for producing appropriate health care professionals by creating learning opportunities for students to learn and gain experience in real-world settings. In placing dental students in various community settings, their training becomes more contextualised and their understanding of the social influences on health were improved, making them more sympathetic towards patients' needs. In this way, they could achieve the relevant competencies required when they entered the health system as a beginner dental therapist.

A Conceptual Framework for Interprofessional Community-based Training for Dental Therapy Students

Abstract

Background. Providing effective health care requires relevant health care workers with core competencies of professional skills, critical reasoning, and ethical conduct, working in teams for comprehensive, integrated patient-centred care for individuals and communities. Student health professionals' clinical training thus need to reform to meet these competencies effectively, upon graduation. Exposure to training in community-based settings in an interprofessional team approach offers real-world learning opportunities for students to achieve these competencies. However, the challenge lies in creating and implementing such learning opportunities for students including dental therapy students.

Objectives. To develop a conceptual framework for interprofessional community-based training for dental therapy students.

Methods. The development of this framework formed part of a larger study that explored opportunities to expand and improve community-based training for undergraduate dental therapy students at an identified tertiary training institution in KwaZulu-Natal. The conceptual framework was constructed using deductive reasoning. The framework comprised of the following components; education system, selection of training sites, student engagement, graduate competencies and health system.

Conclusion. The development of a conceptual framework for interprofessional community-based training could offer a structured approach for curriculum planning and implementation.

Keywords. Framework, community-based training, interprofessional education, learning opportunities.

Introduction

Despite great strides made in the past two decades, South Africa still remains in the grips of a quadruple disease burden (Department of Health, 2015) with communicable and non-communicable diseases being the main health issues (Coovadia et al., 2009). Oral diseases is one of the most common chronic diseases affecting the population due to its high prevalence, severity and the low priority it receives, leaving many people with unmet treatment needs (Van Wyk and Van Wyk, 2004, Singh, 2011). This disease profile impacts heavily on the health system with its shortage of health care workers (Thema and Singh, 2013) and staff with inadequate competencies to effectively meet the demands of its population (Frenk et al., 2010). Providing effective health care requires relevant health care workers with core competencies of professional skills, critical reasoning, and ethical conduct working in teams with other health professionals for comprehensive, integrated patient-centred care in community settings (Frenk et al., 2010). To advance this, education systems need to implement institution and instructional reforms to ensure competency-driven approaches, promoting interprofessional education for collaborative team efforts in addressing main health issues (Frenk et al., 2010). Frenk et al. (2010) proposed that this could be achieved by joint education and health planning, and expansion of academic training into primary health care centres and hospitals within the health system (Frenk et al., 2010).

The University of KwaZulu-Natal in the context of social accountability, strives to educate competent, caring, and committed health care professionals through the adoption of a primary health care curriculum in which all disciplines are expected to integrate the primary health approach into curricula to align clinical training to the needs of the health system. It is envisioned that by expanding clinical training into community settings with emphasis on a team approach, students would be in a better position to attain the core competencies and the transition into the health system, made easier.

Community-based training and interprofessional education have received much attention in the literature, with the benefits thereof, well documented, (Moran et al., 2015) however, the challenge lies in creating such learning opportunities for students. Thus the aim of this study is to develop a conceptual framework for interprofessional community-based training, based on informed research, to guide planning and implementation of such training opportunities.

Methods

The development of this framework formed part of a larger study that explored opportunities to expand and improve community-based training for undergraduate dental therapy students at an identified tertiary training institution in KwaZulu-Natal. The conceptual framework was constructed using deductive reasoning of preliminary research. The framework comprised of the following components; education system, selection of training sites, student engagement, graduate competencies and health system.

The framework proposed, offers a structure around which interprofessional community-based education planning, implementation and integration into curricula can be built. It offers an opportunity for reflection of current curriculum and provides research-informed knowledge to inform curriculum review.

Interprofessional community-based education requires both theoretical and practical components to create a system. This framework is guided by the systems approach in which the health and education systems are viewed as sub-systems which need to link together and cohesively plan education and health matters such as required competencies of health professionals, gender distribution and social origins of health workforce (Frenk et al., 2010). The health system, involved with attending to the needs of the population, informs the training of health professionals. The education system is responsible for preparing health professionals who can meet the needs of the health system in optimally managing the disease burden of

communities it serves (Frenk et al., 2010). This approach is motivated by the Lancet Commission which found a mismatch in the competencies of health professionals in dealing with current disease burdens and health systems' needs worldwide (Frenk et al., 2010).

The framework was built on five components, with each one, interdependently linked to prepare a dental therapy graduate with competencies to effectively manage the oral health care needs of the population in figure 1.

Conceptual framework for interprofessional community based training for Dental Therapy Students

Facilitating transition from student to graduate to beginner dental therapy practitioner

Health System informing the Education System

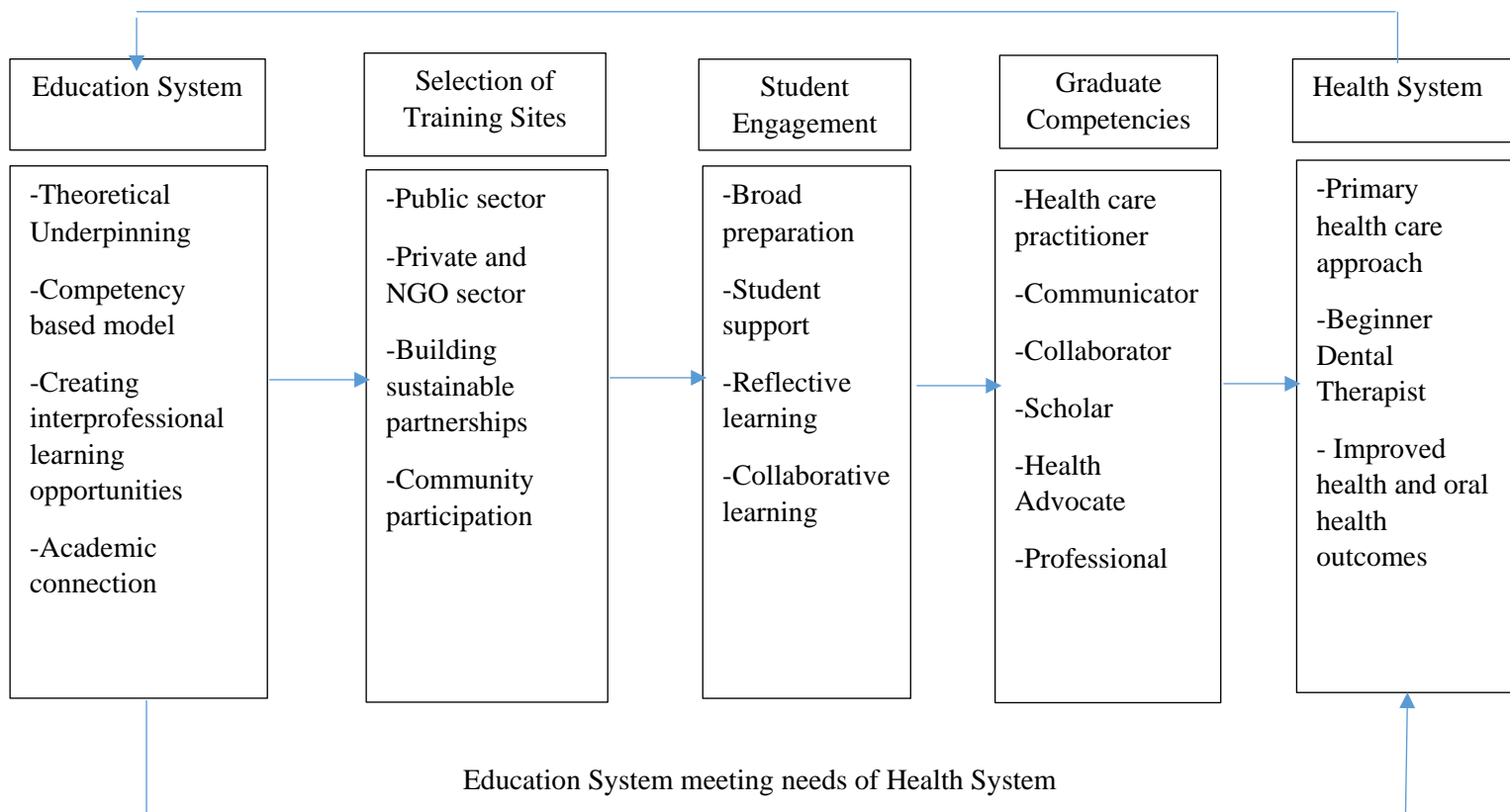


Figure1: Conceptual Framework for Interprofessional Community-based Training

1. The Education System

The education system seeks to produce relevant health care professionals with competencies to match that which is required by the health system. To this end, the University has adopted the Primary Health Care Curriculum for all disciplines in Health Sciences which calls for the primary health care approach to be adopted for clinical training of all student health professionals (Essack, 2014). It is envisioned that by health professional students learning together in communities, in real-world settings, they can develop competencies of being

empathetic, ethical and culturally sensitive, being able to effectively collaborate with other health professionals, to initiate social response in addressing major health problem affecting communities.

1.1 Theoretical underpinning

Four main theories of social learning form the foundation of CBE, namely the constructivist, social constructivist, situated learning and experiential learning theories. The underlying view of these theories is that students learn through construction of their own knowledge by making meaning of their experiences situated in time and place (Fry et al., 2009, Belanger, 2011, Lave and Wenger, 1990, Kolb and Kolb, 2008). The new knowledge gained is social, collective, co-constructed, adaptive and dynamic, (Moran et al., 2015) which shape and amend existing knowledge through practice and reflection (Fry et al., 2009). This view is in stark contrast to theories that informs training of most health professionals, which describes learning as confined to discipline specific domains with knowledge and practice obtained through individual and cognitive means in highly specialised clinical arenas (Moran et al., 2015). This framework proposes that the social learning theories offer a basis in building the kind of knowledge and capabilities required for a graduating dental professional.

1.2 Competency-based Model

Competency is viewed as the integration of professional knowledge, appropriate skills and attitudes to holistically manage oral health needs of patients in realistic work settings (Yip and Smales, 2000). This model offers students the opportunity to transfer skills and knowledge acquired to different settings. Personal attributes such as critical thinking, creative thinking and metacognitive abilities, become embedded, as students adapt to new learning environments (Manakil and George, 2011). It improves students' performance through active participation in problem solving and interdisciplinary understanding and acceptance (Yip and Smales, 2000).

It advocates the shift from a teacher-centred learning approach to an active student-centred learning process. It demonstrates how competencies can be built gradually as the student progresses from being a novice to a beginner to a competent student and finally to become proficient through authentic assessments such as self-assessments and peer-assessments in the form of portfolio and case presentations that allow for learning through self-reflection. This framework supports the competency-based model as a basis for building knowledge, skills and competencies essential for a dental graduate who can be integrated into the health system, fully equipped to meet the needs of communities.

1.3 Creating Interprofessional learning opportunities

The preliminary research revealed that academics are the drivers in creating interprofessional community-based learning opportunities for student health professionals to learn together. Literature also supports that CBE programs should be driven by champions within disciplines especially if there is resistance from other staff (Doherty and Couper, 2016). These authors found that designing CBE programs are complex tasks that require hard work and fully committed staff (Doherty and Couper, 2016). Health professionals' education is in the process of transformation, however, it involves academics to also transform their instructional methods from a teacher-controlled didactic method to one that is more student-centered and reflective. An important aspect to consider is finding a common time for interprofessional activities as this was the major barrier found in the study and well noted in the literature. This requires careful planning by academics. This framework suggests that academics should seize this opportunity for academic autonomy and collaboratively create and facilitate interprofessional CBE interventions for health professional students.

1.4 Academic Connection

CBE must be regarded as an academic activity (Yoder, 2006). Based on the preliminary research, academics noted that students did not take community-based learning seriously resulting in poor attendance at the sites. For students to take CBE seriously, and to be fully participatory, it needs to be embedded in the curriculum and translated into operational programmes and noted on timetables. In addition, it must be compulsory, and not viewed as voluntary or an add-on value, for interested students only. It must have some credit-bearing component attached to it and located within a module or course with a prescribed minimum hours required to show competency to promote a deeper understanding and an opportunity for reflection. CBE should also have an assessment that contributes towards formative and summative marks. In this way, students are fully aware of the significance of CBE. This framework suggests that community based learning must have a strong academic link.

2 Selection of Training Sites

There are several potential locations which provide meaningful interprofessional community-based learning opportunities where students can critically examine their existing knowledge as they reframe their understanding of the effects of social issues on health and oral health (Yoder, 2006). However, Gordon asserts that student learning and clinical competencies depends on a

supportive environment to build these skills, and positive reinforcement from clinical supervisors, hence it is important to select the most appropriate locations so that students may derive maximum benefits. The most important aspects of sites selected, should be the safety and security of the students and that they should provide conducive learning environments. Appropriate learning opportunities can be located within the public, private and NGO sectors.

2.1 Public sector

The KZN Department of Health offers clinical training platforms at community health centres (CHCs) and at decentralised hospitals in KZN. The CHCs offer opportunities for students to manage patients and return to the academic institution in the afternoon. Rotations at the CHC create real-life learning situations where students treat patients as they come in, like in a typical work day. The students are given more independence and are supervised by clinical staff.

The decentralised sites (sites away from the academic institution) offer a sustained student exposure over two weeks of work experience and living in the community which can allow a student to develop both professionally and personally. Students are given the opportunity of first examining the patient, treat the main complaint, and give appointments for follow-up treatment on the same patient resulting in a more comprehensive management of a patient, unlike at the CHC where a patient is seen just once to attend to the main complaint for the day that the student is there. The preliminary research suggests that students can learn clinical skills under mentorship of the resident staff, learn to work cooperatively with communities and health services and understand the broader social context of health and disease.

However, in planning to expand clinical training platforms within the DoH, it is important to first determine the capacity of these clinics to support the student training needs of the academic institution in terms of clinical space to accommodate groups of students at a time, the provision of a range of dental procedures within the scope of practice of a dental therapist, and the necessary equipment and consumables to conduct these procedures. This framework suggests that in planning to expand the clinical training platforms, it is important to first determine the capacity of these sites in supporting clinical training needs in terms of clinical space, available resources, optimal student supervision and the number of students that can be accommodated.

2.2 Private and NGO sectors

Non-governmental organisations and private entities, driven by the unmet health care needs of disadvantaged communities, provide free health care services, via the philanthropy of donors and volunteers, with the intention of serving others, without gaining any profit. Their activities

include health awareness, assessment of vital signs, examination and treatment by a medical practitioner, dispensing chronic medications to patients, vision screening, removal of cataracts, etc. Oral health services range from oral health education and promotion, dental screenings, tooth extractions for relief of pain and sepsis, restorations, scaling and polishing, etc. These community driven health care projects can serve as an innovative opportunity for active student learning by providing a rich environment for community driven training of health professional students.

In the preliminary research, innovative modes of service delivery were noted, such as a shipping container converted into a makeshift primary health care clinic and a mobile health bus which provides dental, optometry and primary health care services at schools. Participation in these projects allow students to connect with the community, develop a sense of social responsibility, gain values of altruism, professionalism and volunteering their services upon graduation, which can contribute to uplifting communities. This framework supports such learning opportunities for health professional students.

2.3 Building sustainable partnerships

In addition to selecting the most appropriate sites for expansion of clinical training, it is important to develop ongoing relationships with the establishments. There is a memorandum of understanding (MOU) between the institution and the Department of Health that binds them in a partnership, however, similar agreements should be made for other projects in the NGO and private sectors in which students are involved. This provides an understanding of each partner's roles and responsibilities and should be viewed as mutually beneficial given that the university benefits in expanding clinical training platforms and being recognised as socially accountable, and the different sectors benefit, as students could complement the current workforce in under resourced areas, improving access to health care.

In the preliminary research, it was noted that although the MOU was in place, clinical staff in individual clinics or departments were not aware of student placements, nor their roles as clinical supervisors. Therefore, it is important for academics to communicate directly with specific departments they send students to, and create their own partnership regarding student issues such as student orientation, clinical supervision, student mentoring and assessment. Sustaining partnerships can lead to ongoing student placements. However, some recognition should be given to partners such as honorary non remunerated appointments, use of library facilities, awarding of grants for research, etc. to maintain long-lasting relationships. (Yoder, 2006) This framework supports sustainable community partnerships.

2.4 Community participation

Collaboration between the university and communities is important for sustainable community-based student programs and student acceptance by community. Often, this relationship appears to be askew as communities are viewed as just being passive recipients of students' services (Mabuza et al., 2013). Diab and Flack assert that it is important to engage with community leaders before student placements to explain their function, as communities feel undermined if not informed of students' presence (Diab and Flack, 2013). Community leaders should be consulted about specific health needs of their communities and students need to align their initiatives according to this. In this way it is mutually beneficial. In the research conducted, it was found that students should also actively involve community members in their health education and promotion so that they are working together towards community upliftment. This framework supports community consultation, communication and participation.

3 Student Engagement

The research conducted involved students participating in CBE programs, both from the discipline specific level and at an interprofessional level to gain insights into their experiences, and as a consultative process to test the inclusion and implementation of CBE before making changes to the current curriculum. The following factors informed the framework:

3.1 Broad Preparation

Students should be broadly prepared before being sent out on CBE rotations. Firstly, students should be at a competency level where they can work independently to successfully complete a task so as not to slow down work progress at the institution they are sent to, as noted in the case study. They should be well informed about the objectives of CBE and the expected outcomes thereof, the services they will be providing at the sites and how this experience connects with their learning. Students need to have information regarding the site and the people they would be interacting with, background knowledge of the community, the demographics, culture, religious practices social habits and peculiar characteristics. This can be done in the form of an orientation prior to starting. An important measure that students should take, is to familiarise themselves with the local language, as this is an important component of student-patient interaction and was found to be a common barrier as observed in the case study and by other authors including Mabuza et al. (2013). Students are also expected to conduct themselves in a professional manner at the sites so as not to bring the institution into

any disrepute. This framework supports that students must be adequately prepared before engaging in interprofessional community-based programmes.

3.2 Student Support

While students are at a decentralised site, they require additional support to that which is in place at the academic institution. Transport to the decentralised site, accommodation and administrative support are essential basic support. Academic support through the university's e-learning site, technical support to stay connected with academic activities continuing at the main campus, and being made aware of communication protocol to access this support are also important. In addition, social services support such as student counselling may be required. They can access this support through an information booklet given to them.

3.3 Reflective Learning

Reflection is the main feature of community-based learning. CBE not only improves students' knowledge and clinical skills, but contributes to development of personal and professional growth. Reflection allows students to see the connection of theory to practice, examine their role in communities by relating closely with people of diverse cultures and socio-economic backgrounds and perhaps seeing their future role in accessing oral health care to the underserved, disadvantaged communities by returning to work there or advocating for change to improve access to oral health care to all (Yoder, 2006).

Reflection can occur during or after the CBE experience and can take the form of written or oral presentations. Written reflections include daily journal entries, portfolios, and self-evaluation essays. Oral reflections include group discussions, seminar presentations classroom-based feedback and discussion. This framework supports student input when planning CBE programs and making changes to curriculum. It further supports reflection exercises after students' experiences.

3.4 Collaborative Learning

Collaborative learning emphasises team approach involving students from different health professions co-learning with each other, involving communities and health professionals to address complex health issues affecting communities. Engaging students in interprofessional projects in communities can build capacity of future health professionals collaboratively working together in improving health of communities. Students learn problem-solving skills, critical thinking skills, peer-learning, team work and mutual respect. This informal learning

opportunities also contributes to life-long learning. This framework supports collaborative learning.

4 Graduate Competencies

The Health Professions Council has developed a set of core competencies for graduating health care professionals to make graduates become more responsive to the provincial and national health priorities, burden of disease and the health system (Health Professions Council of South Africa, 2014). UKZN, use these core competencies to guide the training of student health professionals in the primary health care model that it has implemented. The graduate health professional should be a compassionate health care practitioner who can communicate with patients across cultures, collaborate with other health professionals and work in varied social contexts. This framework uses community-based settings to demonstrate that exposure to this type of learning experiences, students can attain competencies that would better prepare them for the health system. This forms the link between the two systems.

5 The Health System

The health system has a shortage of health care workers in its public sector (Thema and Singh, 2013) and therefore requires relevant health professionals who can easily adapt to the work environment on graduation and effectively attend to patients' needs in diverse communities. With the health and education systems working together, the transition from student to graduate to novice health professional in the work environment is better facilitated.

5.1 The Primary Health Care Approach

The current public health system, in striving for social justice, has adopted the PHC approach to attend to the basic health needs of all members of society, especially the least advantaged (Powers and Faden, 2006). The PHC approach is an integrated health care services based on the decentralised, district-based health system in which a patient accesses care at primary and community health care centres with a referral pattern to district hospitals for patients requiring advanced care by medical practitioners.

The PHC approach is underpinned by principles of equity, prevention, appropriate technology and community participation. The types of care offered are promotion, prevention, curative treatment, rehabilitation and palliative/supportive care. By adopting the primary health care curriculum, the education system is aligning clinical training to that which is required in the health system. In this way clinical training is contextualised and fit-for-purpose. This

framework demonstrates that community-based training offers real-world learning opportunities for dental students.

5.2 Beginner Dental Therapist

It is envisioned that the beginner dental therapist, having already been exposed to real work situations, will readily adapt to the new environment as the case study noted that new dental personnel exiting a dental training institution take up to six months to adjust to a work environment.

5.3 Improved Health and Oral Health Outcomes

Students confined to learning in a dental school hospital-based training centre, become accustomed to this environment with high level technology, modern equipment and materials readily available, and assume this is to be expected when they enter the work environment, however, this is not the case. By exposing them to community health centres where they would be mostly placed, they adapt better to the current state of affairs prevailing in public sector and the existing reality in the broader social context to come up with more meaningful oral health actions that can appropriately address the oral health needs of communities with the limited resources that are available.

In the public health sector, this is the provision of a basic oral health care package in line with the PHC approach, consisting of a dental examination and charting, bitewing and periapical radiographs, relief of pain and sepsis (including extractions), scaling and polishing, oral hygiene instructions and education and the placement of simple restorations (amalgam and composite-1-3 surfaces).

Within the PHC approach, emphasis is assigned to prevention and health promotion. Dental therapists, working collaboratively with other health professionals should provide joint health and oral education talks to patients in community-based settings, in addition to treatment offered, to increase health awareness and knowledge. In this way, this framework envisions oral health care becoming more accessible to individuals, communities and the population and lead to better health outcomes.

Strengths and Limitations of the Framework

The study focused on advocating change in an effort to contextualise clinical training of dental therapists and was based on informed research. It can be used to guide reflection on the current training of dental personnel and can feed into curriculum review and in planning for the future.

It can assist the university to close the gap in aligning clinical training of dental therapists to that of the needs of the health system.

In a broader context, it can be adopted by other universities training therapists in South Africa and in other countries. It was based on a strong theoretic underpinning which could be used by other disciplines to guide community-based initiatives. The framework developed can be useful in providing support for those involved in interprofessional community-based education as it is flexible to use in other disciplines training health care professionals.

The limitation of the framework is that it focused only on enhancing the clinical training aspect and not on classroom teaching, hence more research in this area is required.

Conclusion

The development of a conceptual framework for interprofessional community-based training could offer a structured approach for curriculum planning and implementation.

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5.9 Summary

This chapter presented the results of the study in the form of manuscripts. There were eight manuscripts in total. Each manuscript was presented with a short introduction, followed by a description of how it linked to the aim and objectives of the study and the main study findings were given. The next chapter provides the conclusions of the study and recommendations.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The study intended to explore opportunities for community-based clinical training in the public, private and non-governmental health sectors in KwaZulu-Natal. Three important research questions were developed at the outset of this study.

- What opportunities exist for community driven clinical training for undergraduate dental students in the public and private health sector and through non-governmental organisations?
- What are the opportunities and barriers for interdisciplinary community driven programs for undergraduate dental therapy training?
- How can student community driven activities be integrated using an interdisciplinary collaborative approach?

In order to answer these research questions and to achieve the aim of exploring learning opportunities for community-based training for dental therapy students, this study was focused on producing knowledge that was contextualised to a particular setting. In exploring various community-based sites to expand the clinical training sites, it ensured that students were not merely sent to the sites, but there was a theoretical foundation for making changes to the learning process. There was an engagement with the underlying theory to create situated or authentic learning experiences for students to learn through experience and reflection in real-world settings. In producing such knowledge, the study had several objectives.

The first objective was to determine the intended role of community-based undergraduate clinical training within the College of Health Sciences. This objective was achieved through engagement with academic leaders and academics from individual disciplines and interpretation of their views.

The study findings indicated that the role of CBE was viewed through multiple perspectives of academics, however, consensus was reached that it was a valuable pedagogical approach in aligning clinical training to that which was required by the health system and the needs of communities in various social contexts. The results showed that academics participating in the study perceived CBE as being beneficial at various levels. They believed that it contributed to the professional and personal development of students, allowed the institution to implement policies and teaching strategies in achieving the goal of high impact community engagement.

By students working in community health clinics, it increased the health care workforce, reduced their workload and made health care more accessible to communities. They also believed that communities benefitted with improved service delivery. However, academics in the study also perceived many challenges to the implementation of CBE.

They argued that while the conceptualisation of CBE was documented in the business plan, its implementation and operationalisation was not clearly defined. Other challenges reported were inadequate support from the university and the DoH clinics in which students were placed, co-operation of academics and logistical issues such as timetables and transport.

An important feature that emerged from the study was the importance of assessment in community-based education. Academics in the study deemed it necessary to assess student learning occurring at community sites with opportunities for students to reflect on their experiences and construct their own meanings. This study demonstrated that appropriate assessment methods should be used to assess learning in community-based training. Academics agreed that assessment should provide opportunities for self-assessment to promote reflective and life-long learning.

Evidence from this study suggested that for successful implementation of community-based training, it needed to be driven by interested academics committed to change. It required proper planning, support from collaborating partners with effective communication between the participating institutions.

The second objective was to explore opportunities for interdisciplinary community driven initiatives for dental therapy students with academics from the various disciplines in the School of Health Sciences.

The study findings indicated that academics in the study believed that students learning in an interprofessional manner, exposed them to knowledge and skills of other health professionals and, with this improved understanding of the scope of practice of other professional, they could learn to refer patients appropriately in the future.

The study further indicated that there were several opportunities for dental therapy student participation in collaborative projects including integrating oral health into general health education and promotion talks, school-based programs, joining existing community projects and being part of the rehabilitation team for patients with physical and mental challenges. However, barriers to collaboration were also identified such as the silo approach to teaching, the non-compliance of staff, mismatch in student numbers and time-table scheduling for interprofessional activities.

Objectives three, four and five intended to explore learning opportunities for dental therapy training in the public, non-governmental and private sectors. In doing so, this study showed that knowledge could not only be produced in a homogenous, closed environment of the traditional university setting but in diverse settings, thus demonstrating heterogenetic practice. However, in placing students in heterogenetic settings, it was imperative to note whether the sites were safe and conducive to student learning. Although community-based learning was important, changes in the learning environment could occur, hindering student learning. Community settings may be erratic in nature with factors such as student safety and security at sites being compromised or facilities being poorly resourced in terms of dental equipment and materials, or poor community acceptance of students' treatment, etc. These context specific issues needed to be addressed before students were placed in this heterogenetic settings. Objectives three, four and five sought to address these issues.

The third objective was to identify support for interdisciplinary community-based clinical training in the public health sector with relevant stakeholders within the KwaZulu-Natal Department of Health.

The study findings indicated that of the 18 sites selected, most offered a range of preventive and curative dental services, with the exception of a few not offering restorative procedures (n=3), and scaling and polishing (n=1). These sites also had the necessary consumables and equipment to provide these services, however, 39% did not have an x-ray machine. The study demonstrated that the sites within the DoH could provide conducive environments for contextual student learning. Clinical managers participating in the study perceived that students could master dental procedures, improve clinical skills and participate in school health programs and mobile services, all of which, could help facilitate their transition into the work environment. A major significance of this study was the observation of a definite shift in the way students viewed the patient. In the dental school environment, the patient was viewed as meeting the educational needs for training as appointments in individual departments, meeting a set requirement, to a more realistic, patient-centred care delivery, according to the needs of the patient at the community sites. This heralds a shift from the biomedical to biopsychosocial model of care for patient management.

The findings also showed that there would be continued learning opportunities for interprofessional practice at community health centres as the provincial manager indicated that new community health centres were being designed in such a way as to group chronic illnesses, acute care, eye and dental departments situated close together to facilitate the smooth flow of patients across departments. The layout of these departments could also provide opportunities

for students to learn in an interprofessional approach with examination and appropriate referral patterns.

The study, however, also revealed that there could be a mismatch in training and current practice as some clinics only used composite materials for restorations. This had implications for effective student training because at the dental school, students are still trained in the use of amalgams as recommended by the Dental Deans Committee of South Africa, despite the ongoing debate of the phasing down of amalgam. The main barriers that were identified included clinical space to accommodate a group of students and slowing down clinicians' work progress.

The fourth objective was to explore interdisciplinary community-based learning opportunities for dental therapy training in the NGO sector. The study findings showed that there were many NGO community-driven projects which could provide meaningful learning experiences for student development. These included adapting to different environments, working with limited resources, interprofessional team approach and learning to treat a patient with respect and empathy, irrespective of their social, economic and cultural background. It was inferred in this study that participation in NGO projects could inculcate in students a deeper understanding of social needs and plights, and could develop in them a sense of social responsibility and humanitarianism, inspiring them to volunteer their services in these NGO projects upon graduation.

The fifth objective was to explore interdisciplinary community-based learning opportunities for dental therapy training in the private health sector. This objective was only partially achieved as the researcher only identified two private sector community-driven projects, of which, one refused to participate in the study. However, the one that participated, offered many opportunities for student learning such as joining their school health program to provide dental screening, health education and prevention programs. The only barrier was that they were unable to provide transport for students to the sites.

The data collection process for objectives four and five posed a challenge as data was only collected from the organisations which consented to participation. The data from the private sector was very limited as only one agreed to participate. This may suggest an under-reporting from this sector.

The sixth objective was to explore final year dental therapy students' experiences of community-based training. This objective was adequately met as there was a 94% response rate of students filling in the questionnaire. Positive feedback was received from students participating in the study. They reported improved clinical skills, better time management and

increased self-confidence. They perceived a better understanding of the social determinants of health, social inequalities and diversity in cultures, and developed a strong sense of social accountability, with some seeing themselves as agents of change. This study showed that the through participation in community-based learning, graduate competencies could be achievable. The main challenge experienced was the language barrier that hindered effective communication with patients.

The seventh objective was to determine the attitudes and perspectives of undergraduate dental therapy and physiotherapy students participating in an interprofessional community-based health education programme. The study demonstrated students' openness and readiness to participate in interprofessional activities. This could only have been achieved by academics collaborating with each other in creating and facilitating such opportunities. Observing academics collaborating together in creating interprofessional learning opportunities, students could also learn, through role-modelling, to collaborate with other student health professionals on community-based projects. It sets oral health promotion in the broader context of general health promotion and highlights the need for a multi-disciplinary approach to achieve better health outcomes of communities.

This study further indicated that there were several benefits of interprofessional learning such as greater appreciation of the role of the other professional, the value of team-based approach, significance of peer learning and linking oral health and general health as reported by the students. The transdisciplinary collaboration was made possible through the support received from the Academic Leader and third year students from the Discipline of Physiotherapy and the clinical staff at the CHC.

The last objective was to develop a conceptual framework for community-based training for undergraduate dental therapy students. The framework was developed by combining the formal theory obtained from the reviewed literature and the empirical research conducted through objectives one to seven of the study. It was based on the systems approach in which the two sub-systems; the education and health systems working together to achieve a common goal of producing relevant health professionals with competencies that could enable them to optimally meet the health care needs of varied communities. It illustrated that through a competency-based model, primary health care curriculum and the appropriate selection of community-based sites, the university could provide authentic learning opportunities for students to link training to match the primary health care approach used in the health system. It also illustrated that, through this process, it facilitates the transition from a student to a graduate and to a novice

oral health professional. The framework could be used to guide the integration of CBE into the current curriculum and for future planning.

There are several strengths of the framework, the first being; it demonstrated that knowledge was not only produced in homogeneity, but in heterogeneity when students are taken out from traditional dental school clinical setting and placed in various community-based settings. The framework has a strong theoretical foundation which provided a better understanding of how student learning occurs away from the academic environment. It demonstrated the value of informed research before implementing curricula changes and implementing any new teaching pedagogies. It further demonstrated the importance of obtaining students' input in decision making processes involving curriculum development.

The framework demonstrated transdisciplinary attributes as it could be used by other disciplines in the College of Health Sciences to guide community-based planning and implementation. It could be used by other universities in South Africa training dental therapists, oral hygienists and dentists. On a broader scale, it could also be used in other countries training dental therapists. Thus demonstrating the social accountability of the framework and the study. Furthermore, there could be several social consequences by adopting this framework. It could be beneficial to students as they could experience learning in real-world settings to facilitate their transition into the work environment. The university could benefit as this pedagogical approach could align to its goal of community engagement. The communities could benefit by students' presence in underserved communities, increasing access to health care services and improving service delivery. The health system could benefit as novice health professionals are equipped with competencies that can function in a plurality of settings to meet the needs of communities. It could also increase the workforce community initiatives of the NGO and private sectors.

The framework was only limited to the context of interprofessional community-based clinical training. It did not explore learning opportunities for a common interprofessional, classroom-based, theoretical foundational component for community-based education. Therefore, more research is required to explore this opportunity within the School of Health Sciences.

Several research questions were identified, as outlined earlier in the chapter. The study findings, as related to the research questions, indicated that there were several opportunities for student development, both professionally and personally, in the public, private and non-governmental sectors. The study showed that there were several interdisciplinary learning opportunities for dental therapy students to become actively involved in. The study findings showed that an effective way for collaboration of dental therapy students with other health

professional students was joint oral health and general health talks given to patients. Other collaborative efforts could include, joint school health programs, public screening and being part of a rehabilitation team. To answer the last research question on how could interprofessional activities be implemented, the study indicated that interprofessional learning opportunities needed to be driven by academics, committed in transforming health professionals' clinical training. This process involved academics across disciplines engaging with each other to plan such activities, select appropriate sites, and integrate activities into existing operational programmes and time-tables of individual disciplines. It also required the cooperation of students from participating disciplines. Participating students need to interact with each other, collaboratively identify, design and implement the interprofessional activity which is driven by a community need.

The overall aim of the study was to strengthen community-based undergraduate dental therapy training at a tertiary institution through an exploration of learning opportunities in the public, private and non-governmental health sectors, using a self-developed conceptual framework to guide this process. The aim was achieved through a process of first achieving each objective. By achieving objective one, a better understanding of the role of community-based training was obtained. In achieving objectives two to five, it was revealed that there were several opportunities in the private, public and non-governmental sectors to support community-based training for dental therapy students. Through objectives six and seven, it was acknowledged that student input is valued in making curriculum changes and introducing new teaching pedagogies. By developing the framework to guide the planning and implementation of this process, strengthens community-based training at the Discipline of Dentistry at UKZN.

6.2 Strengths and Limitations of the Study

The strengths of the study focused on supporting and enabling change in an effort to contextualise clinical training of dental therapists. This was shown by providing evidence on the benefits of adopting this pedagogy and its integration into the current dental curriculum. It provided a strong theoretical background on which CBE was underpinned. The study provided useful data on CBE from the perspective of academics involved with community-based training and the students who participated in such training.

In obtaining feedback from the students, the study provided a better understanding of how students respond to different training platforms. The documented experiences of students provided support for the pedagogical approach of community-based training as they reported learning in community settings improved their clinical skills and enabled them to obtain the

graduate competencies necessary for a beginner dental therapist entering the health system. In this way, the study also provided evidence that clinical training could be aligned to the needs of the health system. It also provided support for a shift from a traditional biomedical model to competency based model. The student feedback also showed that student input was valued when considering curriculum review and planning.

The research provided many opportunities for authentic learning experiences in the public, private and NGO sectors, which could expand the clinical training platform beyond the dental school. The site inspections conducted in the study could provide relevant information for the Discipline of Dentistry when considering expanding the clinical training sites, to increase the training capacity of the institution in line with the national imperative.

The study provided support for interprofessional training. Since this was the first time for dental student participation in interprofessional training, it was tested by collaborating with only one discipline as integrating interprofessional activities into existing curricula can be challenging, and the selection of disciplines to collaborate with, is a complex process. It was therefore appropriate to start the collaboration involving two disciplines only so that there were smaller group sizes to allow the smooth facilitation of the process, instead of working with several disciplines and larger groups of students.

Since there was a lack of published data on dental therapy student participation in interprofessional education, this study could contribute to the literature on how dental therapy students could effectively participate in interprofessional learning experiences with other student health professionals and provided several opportunities for this.

The student feedback of their experiences of community-based training provided evidence on how the professional graduate competencies could be strengthened. The feedback demonstrated that the students were able to improve clinical skills as well as acquire other values and attributes of being caring oral health practitioners with ethical responsibilities and greater social accountability. Further manuscripts will be developed from the students' feedback, indicating that this is an ongoing study.

In a broader context, this study produced knowledge that was contextualised to training of dental therapists, however, the findings were also transdisciplinary, showing relevance to other disciplines from health sciences as well as other dental schools training dental therapists, oral hygienists and dentists. Knowledge was produced in various settings showing heterogeneity. It provided a deeper understanding of the research phenomenon with the findings having social consequences which were relevant to real-world settings. In achieving the aim and objectives, this study also acted as an advocacy tool to provide support for the dental therapy profession.

Several limitations were also noted in the study. This study was contextualised to community-based training and was limited to the training of dental therapy students only. Further research on community-based training from the other disciplines is required, with the results being collated to obtain a broader view of community-based education in Health Sciences.

The interprofessional intervention was limited to the collaboration of students from only two disciplines, however, for true integration of an interprofessional approach to community-based education, collaborations with other disciplines within the school need to be established. Therefore, this study initiates exploration of further engagement for opportunities for community-based training with multiple disciplines.

Furthermore, it must be noted that the site inspections conducted within the DoH was relevant at the time it was done. The data obtained may not be reliable at another given time as the availability of resources noted at the time of the study may change due to varying circumstances.

It was acknowledged that this study was limited to a single tertiary site and was context specific. The views and opinions of academics who participated in the study were limited to the UKZN context and was therefore not generalizable. Therefore further research is required at other universities in South Africa to obtain a wider, broad-based opinions of academics regarding CBE with an interprofessional approach.

6.3 Recommendations

There were several opportunities identified for community-based training for dental therapy students in KZN, expanding the clinical training platforms. However, it is important to note the barriers that may affect its adoption. Therefore, this study offers the following recommendations:

- There is a need for a clear operational plan for interprofessional community-based training within the College of Health Sciences at UKZN.
- Curriculum planning should identify strategic entry points for community-based learning in the undergraduate dental therapy training programme. The curriculum should include a strong focus on theoretical concepts and pedagogy to prepare students for community-based training.
- A dedicated pre-community engagement programme should be developed to prepare dental therapy students for entry into the community. This should include understanding of cultural diversity, language and socialisation for true integration within a community.

- There is a need to identify dedicated administrative support for community-based dental therapy training, as part of interprofessional training at the institution.
- A dedicated resource allocation for community-based education will ensure sustainability of such initiatives.

Finally, this study demonstrated that opportunities do exist for community-based training for undergraduate dental therapy students in the public, private and NGO sectors. By taking students out of a homogenous setting of the university/hospital-based training centre and placing them at various heterogenous settings, students are provided with opportunities to learn in real-world settings. Community-based undergraduate dental therapy training would benefit from inclusive decision-making that includes all stakeholders, including academics and students.

This reference list has been compiled using the EndNote X7 version of the Harvard author-date system.

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LIST OF APPENDICES

Appendix 1- Interview Schedule – College Dean of Teaching and Learning

The College Dean of Teaching and Learning, College of Health Sciences

Dear Madam

Date: _____

Attached, please find a list of questions that will be posed to you during the interview. Whilst the questions are fixed, the researcher may ask further questions, based on the original question, in an attempt of gaining clarity or reaching data saturation.

Possible Questions

1. What is your view of community-based clinical training in the education process of health professionals within the School of Health Sciences?
2. In your opinion, how will this add value to current teaching strategies for clinical training in terms of meeting graduate competencies and meeting needs of the health system?
3. What is the strategic direction of the office of Teaching and Learning regarding community-based clinical training for health professionals within the School of Health Sciences?
4. What policies and procedures are in place for community-based clinical training?
5. How can these policies be unpacked at discipline level?
6. What are your views on interdisciplinary/interprofessional community-based projects within the SHS?
7. How do you envision interdisciplinary/interprofessional community-based projects being undertaken?
8. What mechanisms and support can the school provide for community-based clinical training?
9. What factors/features/criteria would you look for in a community-based clinical training site in terms support for clinical training and overall safety for the students?
10. Is there an insurance cover for students travelling to these sites? Is there also professional indemnity insurance cover for any medico-legal issues that may arise?

11. How will community-based clinical training be funded? Is there any university/national imperatives/funding models that are aimed at implementing CBT eg training and development grants or clinical training grants.
12. Is there a memorandum of understanding between the university and various stakeholders participating in community-based clinical training?
13. How can collaboration/partnership be strengthened between UKZN and the various stakeholders such as Department of Health/private sector/NGO?
14. What incentives can the university offer to stakeholders for allowing student training/participation?
15. How do you see Community-based training fitting into the NHI model?

Appendix 2 - Interview Schedule – Academic Leader of Teaching and Learning

The Academic Leader of Teaching and Learning, School of Health Sciences

Possible Questions

1. What is your view of community-based clinical training in the education process of student health professionals within the School of Health Sciences?
2. In your opinion, how will this add value to current teaching strategies for clinical training in terms of meeting graduate competencies and meeting needs of the health system?
3. What is the strategic operational plan present/envisioned by the School regarding community-based training of health professionals?
4. How can disciplines within the school align to this plan?
5. How should community-based training be integrated into the current curriculum?
6. At what level of training should community-based training be introduced?
7. What is the role of academics in community-based teaching?
8. What is your opinion of interdisciplinary/interprofessional community based projects?
9. In your view, how can interdisciplinary community-based projects be implemented?
10. What criteria/guidelines does UKZN use to identify sites for student training?
11. What percentage of clinical training time should be undertaken as community-based teaching in terms of notional hours?
12. What is the role of assessment in community-based teaching? Who will be involved with assessment?
13. What support can be provided in terms of continuation of services when students are not available?

Appendix 3 – Interview Schedule – Academic from School of Clinical Medicine

Academic from Clinical Medicine

Please find a list of questions that will be posed to you during the interview.

Possible Questions

1. What is your view of community-based clinical training in the education process of health professionals within the College of Health Sciences?
2. In your opinion, how will this add value to current teaching strategies for clinical training in terms of meeting graduate competencies and meeting needs of the health system?
3. Can you share your experience of community-based clinical training with the Current MBChB program?
4. What is the progress thus far of the community-based/decentralised clinical training in the MBChB program?
5. What are some of the challenges in implementing the decentralised clinical training?
6. What is your vision of community-based clinical training in the future?
7. What are your views on interdisciplinary/interprofessional community-based projects within the SHS?
8. How do you envision interdisciplinary/interprofessional community-based projects being undertaken?
9. What mechanisms and support are there in place for community-based clinical training from the University?
10. What factors/features/criteria would you look for in a community-based clinical training site in terms of support for clinical training and overall safety for the students?
11. What mechanisms and support are there in place for community-based clinical training from Department of Health?
12. How can collaboration/partnership be strengthened between UKZN and the various stakeholders such as Department of Health/private sector/NGO?
13. How do you perceive the role of Community-based training in the NHI model?

HPCSA Professional Board for Dental Therapy and Oral Hygiene Representative

Possible Questions

1. Can you briefly explain your role in the HPCSA and in Higher Education?
2. What are the HPCSA regulations/guidelines regarding clinical training of dental students?
3. What is your view of community-based clinical training in the education process of undergraduate dental student professionals in terms of setting education and training standards set by the HPCSA?
4. In your opinion, how will this add value to current teaching strategies for clinical training in terms of meeting graduate competencies and meeting needs of the health system?
5. In your opinion, how will this add value to the accreditation process of the dental therapy programme?
6. At what level of training should community-based training be introduced?
7. What criteria/guidelines does UKZN need to use to identify sites for student training?
8. What percentage of clinical training time should be undertaken as community-based teaching in terms of notional hours?
9. What is the role of assessment in community-based teaching? Who will be involved with assessment?
10. What is your opinion of interdisciplinary/interprofessional community based projects?
11. In your view, how can interdisciplinary community-based projects be implemented?

Appendix 5 – Focus Group Schedule for academics of Health Sciences

Dear Participants

The following themes will guide the focus group discussion. Whilst the questions are fixed, the researcher may ask further questions, based on the original question, in an attempt of gaining clarity or reaching data saturation.

Guided Thematic Areas

Theme 1: Vision, Mission and Goal

The University's mission and vision is to be the Premier University that is academically excellent, innovative in research and critically engaged with society to redress the disadvantages and imbalances of the past.

One of the main goals is: *Responsible Community Engagement* which contributes to the upliftment of our province, and to nation-building, by connecting with and committing ourselves to the communities we serve in a manner that adds value and earns their respect, admiration and trust.

To achieve this goal, University has a Business Plan that proposes that a Primary Health Care (PHC) approach should be followed for all programmes offered by the CHS. In line with this approach, the CHS seeks to produce socially accountable, competent and relevant health care professionals with profession-specific technical skills, and generic higher education competencies, values and attributes and aligned to the provincial and national health priorities, burden of disease and the health system. The College is thus committed to offering undergraduate and postgraduate education that is community based.

1. Kindly share your thoughts on the vision, mission and this goal of the University?
2. What are your thoughts then of adopting this at college level?
3. What are your views of how this can be implemented at discipline specific level?

Theme 2: Community-based training

1. What is the current practice of community-based training in your discipline?
2. In your view, how does community-based teaching and learning add value to your current clinical training strategies?
3. From your experience, what are some of the challenges experienced in implementing community-based training?

Theme 3: Assessment of Community-based training

1. What are your views on assessments within community-based training?
2. Can you suggest appropriate methods of assessment for community-based training?

Theme 4: Alignment of community-based training

1. In your opinion, how can community-based clinical training align to the Primary Health Care Curriculum Model (PHCCM) that aims to address service delivery and training of Health Care professionals?
2. In your view, how can community-based teaching align to the health professional graduate attributes in the various roles of health care practitioner who is compassionate and culturally sensitive, communicator, collaborator, leader and Manager, scholar, advocator as envisioned by the College?

Theme 5: Collaboration

1. What are your views of interdisciplinary/interprofessional community-based clinical training?
2. What are some of the interdisciplinary collaborative activities that you are aware of that are being conducted within the School of Health Sciences?
3. What are the opportunities for dental students and other student health professionals collaboratively working together to enhance clinical training of students in the SHS?
4. And how can this influence service delivery to patients in a community setting?
5. In order to undertake this collaborative work, what basic requirements are necessary?
6. What specific type of primary health care services can be collaboratively undertaken?
7. What would be any possible perceived barriers for this collaboration?

Theme 6: Implementation

1. How do you envisage this initiative being incorporated into your individual discipline programs?
2. How do you suggest we make this initiative operational?

3. What model would you suggest for such interdisciplinary community driven training for undergraduate students in the SHS?
4. How will this further align to the vision, mission and goal of the University?

Theme 7: Role of Academic

1. What do you perceive is the role of the academic in the community-based training?

General:

Further comments and suggestions.

Appendix 6 – Gatekeeper permission - DoH



health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Physical Address: 330 Langalibalele Street, Pietermaritzburg
Postal Address: Private Bag X9051
Tel: 033 395 2805/ 3189/ 3123 Fax: 033 394 3782
Email: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

DIRECTORATE:
Health Research & Knowledge
Management

Reference: 319/15
KZ_2015RP43_50

Date: 17 November 2015

Dear Mrs I. Moodley
(University of KwaZulu Natal)
Email: moodleyi@ukzn.ac.za

Approval of research

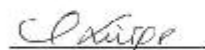
1. The research proposal titled '**The development of an interdisciplinary community driven clinical training model for undergraduate dental students in KwaZulu Natal**' was reviewed by the KwaZulu-Natal Department of Health.

The proposal is hereby **approved** for research to be undertaken at Cato Manor, Hlengiswe, KwaDabeka, Pinetown clinic, KwaMashu, Newtown, Inanda C, Phoenix and Tongaat Community Health Centres.

2. You are requested to take note of the following.
 - a. Make the necessary arrangement with the identified facility before commencing with your research project.
 - b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.
3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely



Dr E Lutge

Chairperson, Health Research Committee

Date: 17/11/15

Fighting Disease. Fighting Poverty. Giving Hope

Appendix 7- Interview Schedule – Provincial Oral Health Manager

The Provincial Oral Health Manager Department of Health/ General Manager: Public Health and Non-Communicable Diseases

Date: -----

Attached please find a list of questions that will be posed to you during the interview. Whilst the questions are fixed, the researcher may ask further questions, based on the original question, in an attempt of gaining clarity or reaching data saturation.

Possible Questions

1. What do you think about the concept of community-based training to align clinical training of health care professionals to the needs of the health system and the needs of communities within the province?
2. What are the opportunities for the implementation of community-based training of dental students in CHCs and hospitals in KZN?
3. In your opinion, which of the DOH clinics and hospitals can actually facilitate this training?
4. How can the DOH support this student training initiative?
5. How can the MOU between DOH and the University be unpacked to support student clinical training?
6. What resources can DOH provide for student training?
7. What will be the role of clinical staff in student training?
8. What barriers do you perceive in the introduction of community-based training in CHCs and hospitals in KZN?
9. What are the challenges foreseen in this endeavour?
10. In your view, how will this initiative benefit the communities attending the CHCs and hospitals?
11. How can a commitment from the DOH be obtained and sustained?
12. What is your view of an interdisciplinary team approach to clinical training of student health professionals from the School of Health Sciences?
13. How do you perceive this being implemented at CHCs and hospitals in KZN?

Appendix 8 – Interview Schedule – Clinical Managers - DoH Clinics

The Dental Clinical Manager

Date:

Name of Facility:

Attached please find a list of questions that will be posed to you during the interview. Whilst the questions are fixed, the researcher may ask further questions, based on the original question, in an attempt of gaining clarity or reaching data saturation.

Possible Questions

1. What oral health care services are being provided?

2. What is the dental clinic space?

3. How many students can you accommodate at a time?

4. What are the opportunities and barriers for clinical training of dental student health professionals at this hospital?

Opportunities:

Barriers:

5. How will you ensure adequate exposure to all clinical procedures?

6. Do you also provide dental services to CHCs in the areas?

7. What are the opportunities and barriers for clinical training of dental students working at these CHCs and participating in the school health services?

Opportunities:

Barriers:

8. How will student supervision be undertaken?

9. Is staff willing to supervise students?

10. Are there any concerns from your side regarding this student training?

Appendix 9 - Checklist of Services and Equipment

DATA CAPTURE SHEET-CHECKLIST OF SERVICES AND EQUIPMENT TO SUPPORT DENTAL STUDENT TRAINING

SERVICE DESCRIPTION

SERVICES PROVIDED	YES	NO
1.oral examination		
2.intraoral radiographs		
3.dental extractions of primary and permanent dentition		
4.simple fillings of 1-3 tooth surfaces		
5.atraumatic restorative treatment(ART)		
6.scaling and polishing		
7.fissure sealant application		
8.fluoride application		
9.fluoride mouth rinsing programs		
10. tooth brushing programs		
11. oral health education		

EQUIPMENT AND FACILITIES

ITEM	YES	NO
1.fully fitted dental unit with light, hand piece unit, suction and compressor		
2. sterilising area –		
3. sterile instruments for every patient		
4. dental autoclave		
5.ultrasonic scaler		
6.fast handpiece in working order		
7.slow handpiece in working order		
8.dental operating stools X2		
9.amalgamator		
10.visible curing light		
11.dental forceps for adult and deciduous tooth extractions		

12.dentalsyringes		
13.dental hand instruments for restorations		
14.dental X-ray unit		
15. dental X-ray film processor		
16.lead apron		
17. X-ray view box		
18.medical emergency trolley		
19.portable oxygen cylinder		

DENTAL CONSUMABLES

ITEM		
1.local anaesthetics- with vasoconstrictor - without vasoconstrictor - dental needles (long and short)		
2.exodontia and oral surgery materials-alvogyl, - hemostatic agents -sutures		
3.Restorative materials- composite material - amalgam		
4.prophylaxis material-polishing paste - polishing brushes -fluoride -Fissure sealant		
Medications- antibiotics -analgesics		
5. Gloves and masks		

HUMAN RESOURCES

Category	No
Dentists	
Dental Therapist	
Oral Hygienist	
Dental Assistants	

Appendix 10 – Interview Schedule – NGO/Private Sector

The Manager of community-based project-NGO/Private sector

Dear Sir/Madam

Name of Organisation _____ Attached please find a list of questions that will be posed to you during the interview. Whilst the questions are fixed, the researcher may ask further questions, based on the original question.

Possible Questions

1. As an introduction, can you give a little background of your organisation?
2. What are the mission, vision and goals of this institution?
3. What current community based projects are being undertaken by the institute?
4. What motivated your institute to undertake this community based health care project?
5. What health care services are being provided?
6. What oral health services are offered?
7. How do you choose the community you wish to assist?
8. Is there engagement with the community leaders to determine their main health care needs?
9. How often are these projects undertaken? Is it a once off or an on-going project?
10. What is the long term sustainability of this project?
11. How is the project funded?
12. How are patient records kept and maintained?
13. What provisions are made for patient referrals or follow-up?
14. What opportunities exist for dental student participation?
15. What barriers exist for student participation?
16. What are the opportunities and barriers for other student health professionals to participate in this project in a collaborative interdisciplinary team approach?
17. What opportunities are there for developing and sustaining a partnership/collaboration with the University?
18. How can the institute support student participation in the following
 - Student placements
 - Student training/orientation
 - Supervision/mentorship of students
 - Trust/confidence in students

Appendix 11 – Student Questionnaire

Record No.

A. STUDENT PERSPECTIVES ON COMMUNITY-BASED EDUCATION

1. What do you understand by the term “community-based education/clinical training”?

2. What was the most positive/fulfilling aspect of your experience of community-based clinical training?

3. What were some of the challenges you experienced with community-based clinical training?

4. What did you learn about the community that you served?

**B. STUDENT PERSPECTIVES OF INTERDISCIPLINARY COMMUNITY
BASED INITIATIVES**

Health Professionals when they qualify are expected to work in a multi-disciplinary team to holistically manage patients, yet in training they are taught as separate disciplines.

5.1 What do you think of participating in collaborative community based clinical training initiatives with other student health professionals?

5.2 What can you learn working in collaboration with other student health professionals?

5.3 What Primary Health Care initiatives do you think you can collaboratively work with other disciplines to uplift communities?

C. STUDENT PERSPECTIVES OF INTEGRATION OF THEORY AND PRACTICALS

6. Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
6.1 The community project helped me to see how the theory I learnt can help me in everyday life					
6.2 Participation in this project helped me to better understand the material from my lectures and readings					
6.3 Participation in this project made me take more responsibility for my own learning					
6.4 Participation in this project helped me build and improve my clinical skills					
6.5 The project made me more aware of the value health professionals can have in the community					
6.6 The project made me more aware of the roles of other health professionals besides my own.					

D. STUDENT PERSPECTIVES ON COMMUNITY BASED CLINICAL TRAINING MEETING GRADUATE COMPETENCIES

7.1 Role of health care practitioner:

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
7.1.1 I felt that I provided optimal, compassionate and culturally sensitive patient care.					
7.1.2 I was able to adapt to working in a community setting.					
7.1.3 I felt I was confident, resourceful and used critical thinking in managing complex care situations.					
7.1.4 This project gave me personal satisfaction in my chosen field.					

7.2 Role of communicator:

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
7.2.1 I was able to communicate with patients from different cultural backgrounds.					
7.2.2 I was able to develop trusting and ethical relationships with my patients.					

7.3 Role of collaborator:

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree

7.3.1 I was able to participate effectively in an interdisciplinary team					
7.3.2 I was able to recognise and respect the roles, responsibilities and competencies of other team members.					
7.3.3 I felt I was able to work interdependently and share tasks with others to plan and provide quality health promotion and prevention strategies for patients.					

7.4 Role of leader and manager:

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
7.4.1 I was able to identify the socio-economic, demographic, cultural and environmental factors that affect the health of this community.					
7.4.2 I was able to evaluate the burden of disease of this community.					
7.4.3 I was able to collaborate with other health professionals to draw up a plan to manage identified health priorities to collectively promote health.					

7.5 Role of health advocator:

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
7.5.1 I was able to identify the health needs of individual patients taking their culture into consideration.					
7.5.2 I was able to incorporate ethical and human rights principles in managing my patients.					
7.5.3 I was able to act as an advocate for patients with particular health needs(including the poor and marginalised members of society)					

7.6 Role of scholar:

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
7.6.1 I was able to reflect on my strengths and limitations of my knowledge and skills					
7.6.2 I am going to use this experience as an on going opportunity to enhance my professional skills and lifelong learning.					

7.7 Role of professional:

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
7.7.1 I was able to display professional behaviour, commitment, respect, empathy, altruism, beneficence and no maleficence when treating patients.					
7.7.2 I felt the work I did really benefited the community.					
7.7.3 Participation in this project showed me how I can become more involved in my community.					
7.7.4 This project helped me to become more aware of the needs in the community					
7.7.5 This made me realise that I have a responsibility to serve the community					

E. PERSONAL REFLECTIONS ON COMMUNITY SERVICE

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
8.1 Doing work in the community helped me define my personal strengths and weaknesses.					

8.2 During this experience I became more comfortable with working with people that are different from me.					
8.3 It has made me more aware of some of own biases and prejudices					
8.4 Participating in the community made me enhance my leadership qualities.					
8.5 The work I did enhanced my ability to interact in a real world context.					
8.6 I feel I can make a difference in the community.					

F. INFLUENCE OF THE COMMUNITY-BASED PROJECT ON YOUR FUTURE PROFESSIONAL WORK

Please indicate your level of agreement with the following statements by placing an X in the chosen box.

Statement	strongly disagree	disagree	neutral	agree	Strongly agree
9.1 I will volunteer to participate in community service when I graduate					
9.2 I will integrate community service into my future career plans					
9.3 I have a responsibility to serve the community					

G. STUDENT RATING OF COMMUNITY-BASED PROJECT

10.1 What are thoughts on supervision at the community- based sites?

10.2 How did participating in a community service project add to your education experience at UKZN?

10.3 On a scale of 0-10, rate your experience of community-based clinical training.

a. educational 0 1 2 3 4 5 6 7 8 9 10

b. rewarding 0 1 2 3 4 5 6 7 8 9 10

10.4. How can we improve upon this community-based experience?

Appendix 12 - Students' Focus Group Schedule

QUESTIONNAIRE FOR STUDENTS –INTERPROFESSIONAL COLLABORATION

Focus group questions

1. What do you understand by interprofessional education?
2. Why do you think it is important for you?
3. What did you know of the other profession before you collaborated with them?
4. What IPE activity did you participate in?
5. How did this benefit you as a professional?
6. How do you think this will benefit the community?
7. What were some of the challenges you experienced when you conducted this activity?
8. How will this benefit you as health professionals in the future when you start working?

Appendix 13 – Staff Focus Group Schedule

Focus group Question for Staff of Physiotherapy and dental departments

1. What is your opinion of this Interprofessional collaboration?
2. How do think this will benefit the students?
3. How do you think this will benefit the community?
4. What are some of the activities do you think students could do collaboratively?
5. From your experience, what are some of the topics you think they should cover in their integrated health education and promotion talks so that the community can really benefit?
6. What are some of the barriers you perceive may hinder the sustainability of this collaborative work?

Appendix 14 – Patient Interview Schedule

Interview questions to patients.

1. What did you think about the talk?
2. Did you learn anything from it?
3. Was the talk clear and audible?
4. Was the talk at the level that you can understand?
5. Will it change your behaviour/habits/attitude in a positive way?
6. Will it change your behaviour/habits/attitude in a positive way?
7. Would you like more of this educational talks?

Appendix 15 - Ethics Approval



9 December 2015

Mrs Ilana Moodley 8625319
School of Health Sciences- Dentistry
Westville Campus

Dear Mrs Moodley

Protocol reference number: HSS/1060/015D

Project title: The development of an interdisciplinary community driven clinical training model for undergraduate dental students in KwaZulu-Natal province

Full Approval – Expedited Application

In response to your application received 5 August 2015, the Humanities & Social Sciences Research Ethics Committee has considered the above mentioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Dr Shamila Naidoo (Acting Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

Cc Supervisor: Dr Shonuka Singh
Cc Academic Leader Research: Prof Prof Mershen Pillay
Cc School Administrator: Ms Ms Phindile Nene

Humanities & Social Sciences Research Ethics Committee

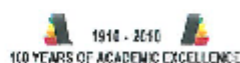
Dr Shonuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0)31 260 3567/6550/4687 Facsimile: +27 (0)31 260 4008 Email: simpso@ukzn.ac.za / sonmarm@ukzn.ac.za / mphindile@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Colleges: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix 16 – Amended Ethics Approval



16 November 2017

Mrs Ilana Moodley 8625319
School of Health Sciences- Dentistry
Westville Campus

Dear Mrs Moodley

Protocol reference number: HSS/1060/015D

New Project Title: "An Exploration of Community-Based Training Opportunities for Undergraduate Dental Therapy Students at a Tertiary Institution in KwaZulu-Natal."

Approval notification – Amendment Application

This letter serves to notify you that your application for an amendment dated 13 November 2017 has now been granted Full Approval.

■ Change in Title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

Best wishes for the successful completion of your research protocol.

Yours faithfully

Dr Shamila Naidoo (Deputy Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

Cc Supervisor: Dr Shenuka Singh
Cc Academic Leader Research: Prof Prof Mershen Pillay
Cc School Administrator: Ms Phindile Mene

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

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Website: www.ukzn.ac.za



Partner Institutions: Edgeood Howard College Medical School Pietermaritzburg Westville

Appendix 17- Gatekeeper permission from UKZN



27 August 2015

Mrs Ilana Moodley
School of Health Sciences
College of Health Sciences
Westville Campus
UKZN
Email: moodleyil@ukzn.ac.za

Dear Mrs Moodley

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN), towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

"The development of an interdisciplinary community driven clinical training model for undergraduate dental students in KwaZulu-Natal province".

It is noted that you will be constituting your sample by handing out and/or conducting interviews with staff and students from the College of Health Sciences, Westville Campus.

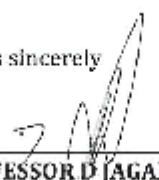
It is also noted that you will be constituting your sample by obtaining institutional data and using the University's name in your study.

Please ensure that the following appears on your questionnaire/attached to your notice:

- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

Data collected must be treated with due confidentiality and anonymity.

Yours sincerely



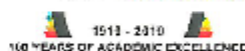
PROFESSOR D. JAGANYI
REGISTRAR (ACTING)



Office of the Registrar

Postal Address: Private Bag X54001, Durban, South Africa

Telephone: +27 (0) 31 260 8005/2203 Facsimile: +27 (0) 31 260 7824/2204 Email: registrar@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses:  Edgewood  Pietermaritzburg  Medical School  Pietermaritzburg  Westville

Appendix 18 – Gatekeeper permission for DoH site visits



Reference: 319/15
KZ_2015RP43_50

Date: 17 November 2015
Dear Mrs L. Moodley
(University of KwaZulu Natal)

Approval of research

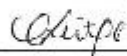
1. The research proposal titled 'The development of an interdisciplinary community driven clinical training model for undergraduate dental students in KwaZulu Natal' was reviewed by the KwaZulu-Natal Department of Health.

The proposal is hereby **approved** for research to be undertaken at Cato Manor, Hlangiswe KwaDabeka, Pinetown clinic, KwaMashu, Newtown, Inanda C, Phoenix and Tongaat Community Health Centres and Edendale, GJ Crookes, Ladysmith, Manguzi, Murchison, Newcastle, RK Khan and Stanger Hospital.

2. You are requested to take note of the following:
 - a. Make the necessary arrangement with the identified facility before commencing with your research project.
 - b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.
3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba on 033-395 2305.

Yours Sincerely



Dr E Lutge

Chairperson, Health Research Committee

Date: 17/09/16

Fighting Disease, Fighting Poverty, Giving Hope

Appendix 19 – Example of Gatekeeper Permission of NGO



**SRI SATHYA SAI SEVA ORGANISATION
SOUTH AFRICA
NATIONAL HEALTHCARE TEAM**

NATIONAL CO-ORDINATOR : DR RAJAN MOODLEY
moodley.rajana@gmail.com



18 September 2015

To whom it may concern

Dear Sir / Madam

Ms Ilana Moodley has contacted our organisation to conduct research on some of our healthcare programmes. We are serviced based spiritual organisation that offers some healthcare programmes to underprivileged communities.

I have no objection to the research being conducted provided the necessary confidentiality is maintained regarding the patients we treat. Please contact me at the address above if there are any queries.

Yours faithfully,

Dr Rajan Moodley

National healthcare co-ordinator

Appendix 20 - Language Clearance Certificate

25 Maple Crescent
Circle Park
KLOOF
3810

Phone 031 – 7075912
0823757722
Fax 031 - 7110458
E-mail:
drsgovender@talkomsa.net
sathsagovender@gmail.com

Dr Saths Govender

22 NOVEMBER 2017

TO WHOM IT MAY CONCERN

LANGUAGE CLEARANCE CERTIFICATE

This serves to inform that I have read the final version of the thesis titled:

‘An exploration of community-based training opportunities for undergraduate dental therapy students at a tertiary institution in KwaZulu-Natal’ by Hanavathie Moodley, student no. 8625319.

To the best of my knowledge, all the proposed amendments have been effected and the work is free of spelling and grammatical errors. I am of the view that the quality of language used meets generally accepted academic standards.

Yours faithfully



DR S. GOVENDER
B.Paed. (Arts), B.A. (Hons), B.Ed.
Cambridge Certificate for English Medium Teachers
MPA, D.Admin.