The application of two capability models to support fourth year medical students' learning.

PhD

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Declaration of own work

This is a declaration stating that the work in this thesis is my own and has not previously been submitted by me for this degree at this or any other tertiary institution.

Marietjie van Rooyen

"I enjoyed interacting with the patients in their own homes. This visit taught me that, a patient is more than what we see. There are many factors that influence the way a patient presents and how they will present. I also learned that before concluding on what the patient is telling you or what you think you hear, have at least a bit of understanding about the patients background, social status, living conditions, and life in general. Treating a patient is not only managing their disease, but managing their life in general."

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    - My mother, for her unwavering willingness to assist with our household during times when I needed to focus on writing, and for her loving support in difficult and good times.
    - Our children: Liam, Mia, Charl and Joshua; for being a great inspiration to me; for being patient and understanding when I needed to focus my attention away from them, and for always making me laugh.
- My Creator, for His guidance.

SUMMARY

APPLICATION OF THE CAPABILITY FRAMEWORK TO SUPPORT STUDENT LEARNING IN THE L-CAS PROGRAM

Background:

The Longitudinal Clinic attachment program for students (L-CAS) offers opportunities for students to visit complex and diverse learning sites in primary care settings where they can acquire and practice consultation skills. The three-stage assessment and plan were used as an objective indicator of the development of a number of competencies over the course of a year.

Problem statement and research question:

The aim of this study has been to explore and better understand learning related to L-CAS activities, so that the L-CAS curriculum can be planned and executed to specifically support learning with the question: How does the application of the two capability models support fourth-year medical student learning during and after L-CAS visits?

Theoretical underpinning:

Two models, namely the Medical Education Model of Capability and the Department of Family Medicine University of Pretoria (DoFMUP) Capability Approach to Learning, were identified, with capability as the theoretical basis, to describe the learning process.

The Medical Education model provides a framework for planning and evaluating curricula. This model was used to identify and understand students' aspirations

and capability sets, their perceptions of enabling and hindering factors and the attainment of aspirations.

The DoFMUP Capability Approach to Learning is a practical way of understanding the process of learning in a complex world. This model was used to determine the development of students' competence to perform a three-stage assessment and management plan (3SAP) for patients encountered in various primary healthcare settings over one year, and scaffolding deemed necessary to support learning.

Methods:

Qualitative and quantitative methods were employed.

Content analysis and grounded theory underpinned the qualitative analysis. Data from the questionnaire, focus groups and interviews was used to explain and understand students' perceptions about their own development and learning in L-CAS, enabling and hindering factors, and how learning can be optimized.

Quantitative analysis was used to report on students' aspirations and their perceptions of attainment of those aspirations. Patient case reports were analysed to asses change in competencies over one year.

Results:

It is clear that L-CAS offers students ample opportunities to learn, but because of all the challenges they face, most students did not choose to address their learning needs personally but responded with being demotivated. Students were able to identify significant resources that can enable them but failed to use these

in dealing with their challenges. Most students perceived growth, and reported learning, but unfortunately this was not evident in their patient cases.

It is clear that the aspirations students set for themselves are different from what we expect of them.

Discussions and Conclusions:

A novel model is derived from both the capability models and aspires to support and enable the learning process before, during and after L-CAS visits. Better planning of the timing of L-CAS sessions and weighting of the credits are suggested as well as better preparation and empowerment of students using the "CHILL" acronym with focus on the resources available at the sites, like peers, community healthcare workers (CHWs) and electronic devices.

The research question has been answered in that both the models highlighted challenges and potential areas of improvement of the L-CAS curriculum that could be addressed by the implementation of the novel model.

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IRB 0000 2235 IORG0001762 Approved dd 22/04/2014 and Expires 03/14/2020.

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Faculty of Health Sciences Research Ethics Committee

30/03/2017

Approval Certificate
New Application

Ethics Reference No.: 82/2017

Title: The application of two capability models to support 4th year medical students' learning.

Dear Dr Marietjie van Rooyen

The **New Application** as supported by documents specified in your cover letter dated 24/02/2017 for your research received on the 24/02/2017, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 29/03/2017.

Please note the following about your ethics approval:
- Ethics Approval is valid for 3 years
- Please remember to use your protocol number (**82/2017**) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, or monitor the conduct of your research.

Ethics approval is subject to the following:
- The ethics approval is conditional on the receipt of **6 monthly written Progress Reports**, and
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

Additional Conditions:
- Approval is conditional upon the Research Ethics Committee receiving permission from Prof Lindeque, the Dean.

We wish you the best with your research.

Yours sincerely

Dr R Sommers; MBChB; MMed (Int); MPharMed,PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).

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Faculty of Health Sciences

Faculty of Health Sciences **Research Ethics Committee**

7 December 2020

Dr M van Rooyen
Department of Family Medicine
University of Pretoria

Dear Dr Van Rooyen

Renewal certificate for study 82/2017

The Faculty of Health Sciences Research Ethics Committee (FHS REC) hereby confirms that ethics approval for your study 82/2017 has been extended until 31 March 2021.

All best wishes

Yours sincerely

On behalf of the FHS REC, Professor Werdie (CW) van Staden
MBChB, MMed(Psych), MD, FCPsych(SA), FTCL, UPLM
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CHAPTER 1: INTRODUCTION

Thesis statement

The Longitudinal Community Attachment Programme for Students (L-CAS) is a curriculated activity that provides learning opportunities for the acquisition of competencies required for the performance of a successful consultation and growth as a medical professional. Students' capability to consult a patient constitutes adequate performance of an appropriate and comprehensive case assessment and the development of a management plan that takes the complexities inherent to different primary care settings into account.

Background

At the University of Pretoria (UP) School of Medicine (SoM) , students have, during their six years of training, the opportunity to learn in complex and diverse learning environments with the final outcome of becoming a 'generalist doctor'. These learning sites range from lecture halls and hospitals to community sites including patient homes. L-CAS offers students curriculated opportunities to visit primary care learning sites in settings in and around Tshwane. The Metropolitan area of Tshwane is centered on the city of Pretoria with surrounding towns and localities.

Longitudinal Community Attachment Programme for Students (L-CAS)

The SoM, in 2007/8, identified a need for medical students to spend time in the primary care setting, as most of their training happened in tertiary institutions and at campus. A proposal to address this problem was put together by the DoFMUP in the form of the L-CAS.

The initial focus of L-CAS was to expose students to the first contact clinical care of patients longitudinally (years one to five of their training programme), in primary care clinics and healthcare centres. This Programme was built on the principles of academic service learning, with the objectives of relevant and meaningful service to the community, enhanced academic learning, structured reflection, social responsibility and partnerships, and collaboration.[1] As soon as the Undergraduate Programme Committee had granted permission, the implementation team started negotiations with the relevant governmental authorities, to incorporate the students in the facilities.

The negotiations and initial planning of L-CAS involved the Undergraduate Programme Committee, students, lecturers from the DoFMUP, organisers or academic activities, the Gauteng Health Department and Local Authority representatives. Initial planning revolved around incorporating service learning into academic curricula and accommodating the students at the various clinics. Mentors were appointed and trained for each clinic. L-CAS was implemented in the second semester of 2008, for the first-year medical and dental students.

Initially, students visited clinics during all their academic blocks and other activities. Logistical support was made available at the DoFMUP. Each student was allocated to a clinic in a group of between eight and ten students, for a year. The L-CAS team, clinic representatives and academic block representatives jointly developed tasks. These tasks were linked to the theoretical content covered in class. A student portfolio was created with all the necessary information, including safety, security, travel arrangements, timing, planning of visits, tasks and the feedback and reflection forms. Yearly feedback and reflection sessions were conducted with students, with the view to improve and change the project as needed.

L-CAS evolved and changed since 2008 in response to feedback from students, logistical challenges within the governmental sector and the national health plan, that expanded to include Community Oriented Primary Care (COPC) which aims to move primary healthcare from institutions like hospitals and clinics to the community and into patient's homes. [2,3,4,5] In the first semester of 2009 the project was extended to include all the medical students from years one to five and dental students from years one and two. In 2009 the South African National Defence Force (SANDF) came on board as a partner and offered four of their clinics as training facilities. Their doctors acted as mentors in these clinics. In 2010 the number of clinics was increased to 51 Doctors, Primary care sisters and registered nurses were appointed as mentors for the other clinics.

Unfortunately, the number of mentors needed to be limited in 2010 due to UP, Faculty of Healthcare Sciences, School of Medicine financial constraints. Since 2013, mentors could no longer be afforded. Feedback from students indicated that mentors played a vital role in their learning experience at training sites, therefore further changes had to be implemented to compensate for the loss of mentors. The clinics, furthermore, suffered logistical and capacity challenges. The planning team realized that students need to work in communities and share community resources. To address these challenges the L-CAS team included inter-professional learning activities and adapted the concept of 'mentors' to 'community-based facilitators'. This meant that community-based workers, with a minimum qualification of Grade 12, from different disciplines acted as facilitators for students doing inter-professional learning in communities. This model of teaching and learning used self-directed learning as the theoretical background. Students were tasked to learn from the patients they encountered with the CHWs, by identifying a learning need and finding the answer to that learning need. This process was monitored by the facilitator of the project through the reflective reports of the students.

Learning platforms were further expanded by including community-based institutions and services, e.g. old age homes, hospices, places of safety, homes where home-based care was practised, schools and especially COPC sites.

Lastly, L-CAS was formally and explicitly included in the medical programme and designated with a course code. Credits (notional hours) were, however, not listed separately, but reflected in the totals of the specific clinical modules students were enrolled for during the time that the visits were scheduled.

With the development of COPC and Ward Based Outreach Teams (WBOTs)[2,3,4,5] in Tshwane in 2011, students were placed in communities. COPC is an internationally recognized, integrated approach to PHC that brings health and other professionals, organizations and people together in defined geographical areas, to identify and respond systematically to health needs.[3] Students worked with the WBOT teams that consisted of community health workers (CHWs) and a registered nurse, whom they accompanied to various learning sites. CHWs are community members with the minimum qualification of Grade 12, who are appointed to visit households and do health risk assessments and referrals to clinics. CHWs form part of the WBOT team that take responsibility for the health of each learning site.

Although these sites offer many advantages, the logistics and organisation of the visits posed a serious challenge. The visits are also challenged by factors outside UP control, for example wage disputes and personal safety issues.

From 2017, the planning of L-CAS focused again on COPC with a specific emphasis on the patient in his/her context and all the different aspects of the consultation. Each student is exposed to the care of patients in a variety of contexts from the home to the hospital, including patients in old age homes,

schools, nursery schools, shelters and clinics, relying on students to self-direct their learning. These learning sites have been identified and developed as academic WBOTs, and specific outcomes and objectives for each visit defined.

The DoFMUP created objectives for L-CAS to underpin the educational planning of the program and inform the teaching and assessment. The new objectives defined for L-CAS in the study guides for 2017 are listed in Table 1.

Table 1: Objectives for L-CAS as defined in 2017

As a result of L-CAS activities students should be able to:
• Experience the patients in their context and understand all the different aspects related to that context, • Practise COPC (students should see the principles in action and experience the link between the home, the clinic, and the hospital), • Understand the function of the healthcare facilities within the communities, • Function in any complex, varying or unfamiliar context/situation, • Communicate effectively with patients and practise interpersonal skills through interaction with different kinds of people, • Conduct a proper consultation with a patient, including the performance of a three-stage assessment (3SAP) and development of a management plan, • Conduct a proper and appropriate clinical examination and perform the necessary procedural skills, • Display self-directed learning skills to acquire the necessary knowledge that will enable them to function in L-CAS, • Practise the necessary information technology (IT) skills that will enable them to use the IT support offered, • Use reflective skills to aid their learning, and • Acquire one of the official languages of our country, that will enable them to communicate more effectively with patients in South Africa.

Concept Clarification

Capability

In the context of L-CAS capability is defined as the process of development of the students' competencies, by identifying and engaging with the learning opportunities within the activities of L-CAS. This process should enable them to understand the complex situations that they face in the primary care settings of the Tshwane District. Students must then be able to use this new meaning and growth to inform their future patients' management decisions. This capability will be evidenced by the increasing ability of the student to effectively apply the consultation competencies in order to develop an appropriate 3SAP for each patient.

Comprehensive three-stage assessment and management plan (3SAP)

This entails the judgement a student makes about each clinical encounter and includes:[6]

i) A clinical diagnosis, including etiology and complications, health prevention and promotion.
ii) A personal assessment of the patient including their fears, expectations, values and impact of the disease on the person; and
iii) A contextual assessment, including the influence of the context on the patient and vice versa and health promotion and prevention in the community, including the patient's social structure, family, work environment and local community.

Through analysis of their findings, students are then required to develop a treatment plan to address all identified challenges, taking into consideration the healthcare team and integrative care.[6]

Learning sites

These are the geographical areas in and around Tshwane, that students visit during L-CAS activities, to meet patients, community health workers, peers and facilitators. These sites range from facilities and institutions, including primary, secondary and tertiary hospitals, as well as clinics, old age homes, crèches and hospices, not-for-profit organizations (NPOs) and health posts in communities, where the Ward Based Outreach Teams (WBOTs) are located.

Competence

Competence involves learning whereby students acquire and master a new skill, attitude or knowledge.[6] The competent physician is therefore one that are able to perform skills, display attitudes or have knowledge that enable them to be capable in dealing with a patient. The consultation competencies that will be relevant to this study are listed in Table 2:

Table 2: Consultation competencies that will be evaluated in this study

Clinical component	Description and Code used in the analysis of data
• History taking	Clinical skills (Comp1C)
• Examination skills	
• Clinical reasoning	
• Sourcing evidence to make a diagnosis	
• Special investigations	
• Compliance in a patient with a chronic disease	Follow up of a chronic disease (Comp2C)
• Control in a patient with a chronic disease	
• Complications in a patient with a chronic disease	
Individual assessment	
▪ Doctor-patient relationship	Individual assessment skills (Comp3C)
▪ Communication skills	
▪ Patient's understanding of disease	
▪ Value system and beliefs of patient	
▪ Cultural sensitivity	

Clinical component	Description and Code used in the analysis of data
▪ Language	
Contextual assessment	
▪ Context of the patient	Contextual assessment skills (Comp4C)
▪ Effect of the context of the patient on the disease, and of the disease on the context of the patient.	
Plan	
• Understanding of the disease and its management: ○ Include all the aspects of the 3SAP ○ Pharmacotherapy ○ Non-pharmacological interventions	Contextual assessment skills (Comp4C) Management plan (Comp5C)
• Primary care / understanding of COPC ○ Prevention, health promotion and management of disabilities ○ Integration between different platforms of care	Primary care and COPC (Comp6C)

Community Oriented Primary Care (COPC)

The National Department of Health (NDOH) instituted major health care reforms in 2011 to address the health system crisis created by the four epidemics namely maternal, new-born and child health; HIV/AIDS and TB; violence and injury; and non-communicable diseases[2]. In support of the re-engineering of Primary Health Care (PHC) and the need to create a learning platform that is relevant and appropriate to the needs of health care in the 21st century, the DoFMUP has been involved in the conceptualisation, development and implementation of a community-oriented approach to primary health nationally.

The re-engineering of PHC involves moving the focus of intervention from institutions (clinics and hospitals) to the structured introduction of healthcare at the community coalface, i.e. as close as possible to where people live. Two of the

major challenges and focus points of this plan are to train and deploy outreach teams, consisting of CHWs and health professionals such as professional nurses and doctors, to do home care in geographically identified municipal wards and secondly, to address school health.[3,4]

One of the principles on which this initiative by the minister is built, is Community Oriented Primary Care (COPC).[5] COPC is defined described in Table 3.

Table 3: The definition and description of COPC[5]

COPC is user centred primary healthcare that is:
• Built from a community health diagnosis/assessment (CHD), • Rendered in a defined geographical area where relevant role-players have assumed full responsibility, • Rendered close to the individual and the family, • Holistic in its consideration of Community as a bio-psycho-social 'Organism', • Ensures continuity of care and continuous review of the CHD, • Is based on co-responsibility between health care users and service providers, • Integrative between community organization/s and health education, and • Inclusive of promotion, prevention, primary curative care and rehabilitation.

The DoFMUP partnered with the Department of Health to pilot COPC in nine districts in 2011-2013.[4] Subsequently, the DoFMUP has been, and will continue to be, involved with the Municipality of the City of Tshwane in implementing a COPC approach to primary health through Ward-based Outreach Teams (WBOTs). [2,3]

WBOTs are one of four streams of the NDOH's NHI and district health system's reform. The others are: District Clinical Specialist Teams, Integrated School Health Services and the deployment of private General Practitioners in the District Health Services. The WBOTs consist of a professional nurse acting as a

team leader and a group of CHWs (usually between 18 and 30 years of age).[3,4]

The team leaders and CHWs were identified as facilitators within the COPC system that can aid the L-CAS student visits to community sites. L-CAS has been adapted to support and complement this initiative in its learning objectives and learning activities, by incorporating the principles of COPC into the L-CAS objectives and focusing the site visits mainly on the WBOTs.

Learning

On-going personal and professional development of students, health workers and families are integral to the L-CAS/COPC project. Students need to develop their own sense of self, motivation, confidence and values, as well as the capability to function at any learning site, demonstrated by the ability to set a comprehensive 3SAP[7] for each patient they encounter. The assessment of a patient is a justifiable summary of the most recent reality a patient may be experiencing. The aim of an assessment is to clearly identify and describe all the challenges of the patient, in a way that will help the student and the patient to set up a plan of how to manage the patient's health. In order to do this, the student has to collate information from all relevant aspects of the patient's life – physical, personal and contextual.[5] The advantage of returning to the same community is that students experience continuity of care i.e. they can witness the changes that occur, in terms of the contexts and response to treatment, over time. Health workers need to constantly acquire more relevant knowledge and skills; and patients need to be supported and empowered to become agents of their own health.

The curriculum for L-CAS is determined by learning needs students identified during daily clinical work for themselves, with a specific focus on the content of each of the academic discipline blocks they are busy with. The learning objectives of L-CAS focus on developing students' competence to accurately

assess a patient, in any context, across all the different learning sites. This judgment entails making an appropriate assessment of the clinical, individual and contextual diagnosis, as well as developing a management plan that addresses all challenges, on all levels, and takes into account the principles of primary health and COPC. The learning needs that students identify themselves should fit into this framework of the 3SAP. The purpose of the broader objective of L-CAS is to not focus the learning needs of students to narrowly, but rather afford wide options for learning.[8]

The clinical assessment (the biology of the body) will include identified pathology of the body, whether it is an acute or a chronic problem, the aetiology that could be identified, the control of the disease (in the case of a chronic disease), any complications that the patient might suffer from (end organ damage) as a result of the disease(s), compliance (adherence to treatment), side effects of medications and the general state of the body. [7]

The individual assessment always starts with the person, including anything inside the person that has an impact on the disease(s) and person, for example the developmental stage of the patient, his/her emotions, the reason for seeking help (patient agenda), relevant ideas, concerns and expectations, as well as the patient's perceived ability to respond to problems.[7]

The contextual assessment includes anything of relevance, outside the patient, to understand and manage the patient with the disease. This assessment includes the family, home, work, the community they reside in, available health services and resources available to the patient.[7]

In order to perform an assessment of the patient, the students will need to have the competencies of consultation, including communication and examination

skills, interpersonal skills, professionalism and critical thinking. To enable a student to set an appropriate management plan for the patient, the student needs a sound understanding of the disease(s) of the patient, insight in the understanding and value system of the patient, the context of the patient and the primary care system (including COPC). The theory of these competencies, as well as some practical experience and practice in the skills laboratory, has supposedly been acquired in years one to three of the medical curriculum. Students have very few opportunities, with the exception of L-CAS, for patient interactions before their fourth year.

During L-CAS visits students are expected to work with fellow students as well as CHWs when they consult with real patients, in complex contexts. They have to identify problems and risks, perform a three-stage assessment and develop plans to address the identified challenges. They are also expected to identify and address their own learning needs in response to the challenges they face during each encounter.

Theoretical underpinning: Capability

Capability, as a theoretical framework, can be used to describe the process of learning, as it addresses more than just development or acquisition of one competency, but rather the development of the individual as a professional and as a person.[9]

In the literature two capability models are identified and described in the field of medical education. This study will use both the model of capability in medical education, as described by Sandars and Hart, [9] and the model developed by the DoFMUP, [5] because of the potential of both models to contribute significantly to the understanding of student learning in L-CAS.

Students are encouraged to use the DoFMUP capability model (figure 2) to understand and support their own learning. Students and CHWs attend lectures on the theoretical background of the model as well as the practical application of the model from their first year on.

Capability background

Amartya Sen conceptualised capability as a critique of the narrow economic rationality and self-interested 'economic man' model in economics.[9] Although Sen's model was first described in the economics field, it has been adapted and used in the Humanities, Higher Education, Social Justice and other fields.[9,10,11,12,13] These concepts will be discussed in greater depth within the literature section.

According to Sen a person's functioning is linked to the things they value doing, and these values are subsequently linked to capabilities. A person's functioning is thus linked to the values and interests that enable you to make choices in life that will provide reason to value that life. Capabilities enable a person to make judgments and to act on these judgments. In Sen's model the terms 'resources' and 'agency' are described abstractly as the two components that create capability. According to Sen, capability is a person's freedom to achieve well-being.[9,10,11] Sen's model implies that a person has the opportunities to convert resources into aspirations – to set the goals for well-being and quality of life and turn personal aspirations into behaviours that are valued. This will enable the achievement of these valued things by using real opportunities and resources to reach goals.[9,10,11,12,13]

Sen focusses on both the person's ability to choose and to convert that choice into action – to convert their resources into aspirations and functionings. Functionings are described as 'parts of the state of a person' – in particular the

various things that he or she manages to do or to be in leading a life.[13] Sen adds that: "…the capability of a person reflects the alternative combinations of functionings the person can achieve, and from which he or she can choose."[13]

The capability approach rejects the notion that resource plays an integral role in a person's sense of well-being. Resources are seen only as means of enhancing well-being while the focus should be on the intrinsic factors of functioning and capabilities.[10]

Model 1: The Medical Education capability model

Recently, this model of capability has been described in the field of medical education and published in an AMEE (Association for Medical Education in Europe) guide,[9] which is seen as the gold standard of practices in medical education. As illustrated in Figure 1, it remains highly abstract and formal, but provides a framework for planning and evaluating curricula.

The Medical Education capability model will be used to identify and understand students' aspirations and capability sets (including whether the objectives of L-CAS are part of their desired capability sets or not) and their perceptions of the factors that enable them to achieve and those that hinder them from achieving those capabilities that they value or deem important. It will also help in evaluating the students' sense of attainment of these identified capabilities.

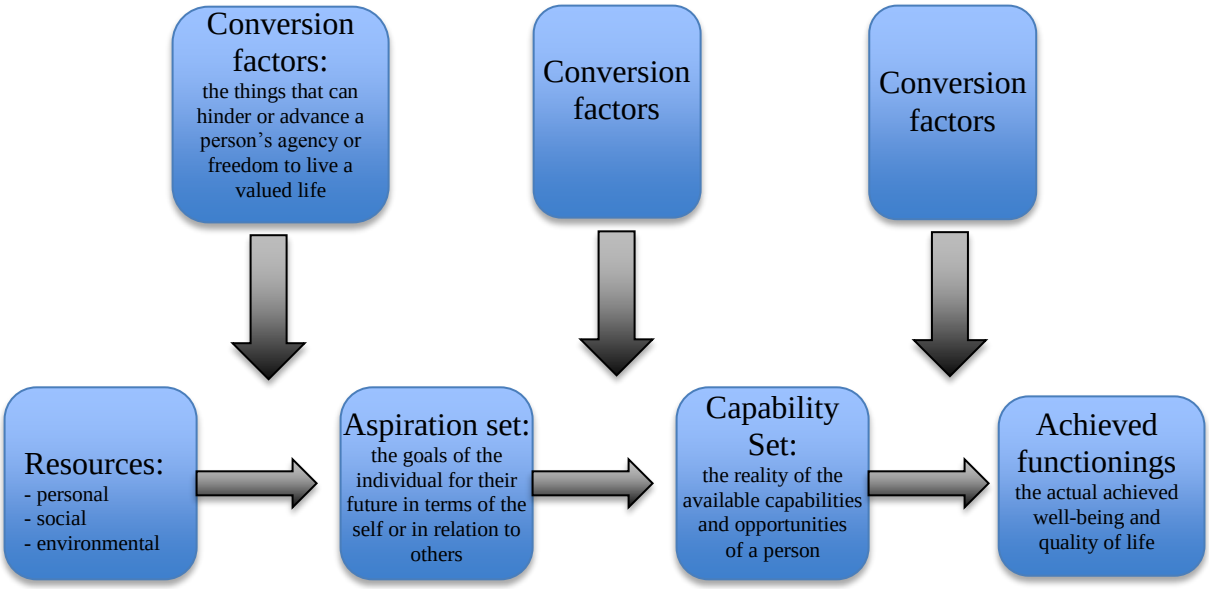


Figure 1: The process and core concepts of the capability approach in medical education.[9]

Recognising the potential of the capability model as an approach to learning, the Family Medicine project team has been developing the capability model as a practical way of describing the architecture that informs lifelong learning in a complex world.[5]

Model 2: The DoFMUP capability approach to learning

The DoFMUP considers capability to be a developmental, meaning-making process that happens over time.[5] The capability approach to learning also draws on the strong philosophical arguments of Sen,[12] as well as the long-established educational theories of learning through practice (Academic Service Learning)[1], self-regulated learning,[14,15] reflection[16,17] and feedback.[18] The notion that professional capability hinges on adaptability are also taken into

consideration.[18,19,20] The model states the belief that learning occurs through the interaction between persons and their concrete experience.[19,20] This involves having the experience (e.g. an encounter with a patient), reflecting on the experience, forming your own concepts and generalisations of that experience and then applying those in a new situation (on a new patient).

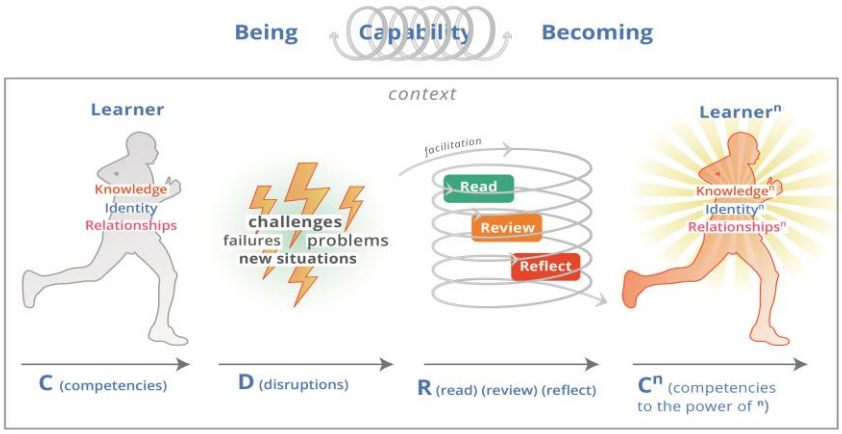


Figure 2: The DoFMUP Capability Approach to Learning.[5]

Traditional didactic educational practices are not designed to challenge students to perform in an integrative way across thinking, feeling and doing domains or to prepare them to learn from stressful situations.[19] Students therefore do not get many opportunities to develop their own practical knowledge of interaction between people, tasks and strategies when they only engage in didactic learning strategies. Students' own learning can be greatly enhanced through reflection. Students should learn to be reflective practitioners – learn to attend to and interpret their own experiences.[21,22,23,24,25,26]

During L-CAS visits students are generally challenged with tasks that are relevant to the academic block they are busy with. They are also able to engage with the patients on a personal level and take an active part in the service delivery team, while taking responsibility for their own learning. The emphasis of

these activities is reciprocal learning where students can also learn from the community, the other members of the healthcare team and their peers. Capability mobilises individual and collective reflection and cooperation. In essence, it is a self-regulatory process, underpinned by reflective practice that integrates socio-cognitive learning in context.[16,17]

This new capability model describes learning in a complex world, where the decisions students make may not be the most appropriate for the patient at that stage. It is important for the student to make that decision and evaluate its appropriateness and correctness with external and internal feedback structures. In making and applying decisions, students then consciously learn to engage in a self- and group evaluative learning process that over time will enable them to make judgments that are more appropriate to the complexity of health. It is important to note that all students always work under the supervision of a senior, registered staff member.

Informal learning in the workplace, reflective practice and interactive episodic contexts are the main suggested sources of professional and workplace-based learning.[23,24] Knowledge that will become deep-rooted is often the knowledge that is created when problems are being solved.[24] It is fundamental to each individual's development that s/he learns from experience.[18]

It is possible to demonstrate capability in students through assessed tasks, particularly their development of patient assessment and treatment plans.[26] For this study students are required to do a 3SAP i.e., a clinical diagnosis, a personal assessment of the patient, and a contextual assessment, on every patient encounter they have as part of any L-CAS activity.

From an analysis of what they find, they are then required to develop a treatment

plan to address all the identified challenges. It would then theoretically be possible to assess students' development over time in terms of the accuracy and comprehensiveness of their assessment and management plans. Capability is a process of acquiring a range of new competencies and therefore it must be monitored over time. Capability requires students to question their current understanding and assumptions. They should create and enact new responses (acquire new competencies) to familiar situations that will enable them to respond to new situations effectively.

The DoFMUP capability model will be used in this study to determine the level of fourth year medical students' capability. This was done through an assessment of students' competence to perform appropriate 3SAPs for patients that they encountered in various primary health care service settings.

The study looked at the impact of working unsupervised in primary care settings on student learning, and identified resources of learning that are in place and that may be essential to the development of capability.

Problem statement

Although L-CAS has been running since 2008, the extent to which L-CAS impacts student learning is unknown. There is very limited researched understanding of the learning that takes place in L-CAS, or the impact of the L-CAS visits on the students' development as competent professionals.

Hence there is a need to explore and better understand the process of learning that takes place during and after L-CAS visits, so that the L-CAS activities can be planned and executed to specifically support learning.

Research question

How does the application of the two capability models support our understanding of fourth year medical student learning during and after L-CAS visits as to inform future L-CAS activity planning and implementation?

Purpose of study

The purpose of this study is to inform the future learning strategies to support learning and curriculum design of L-CAS. Two capability models will be used to interpret and understand evidence students provided regarding their learning as a result of L-CAS activities.

Aims

- To describe fourth year medical students in terms of reported current learning behaviours and objective evidence of reported learning as a result of L-CAS activities.
- To apply the two capability models to the reported learning behaviours
- To inform the planning and curriculating of future L-CAS activities.

Objectives

1. To determine students' perceptions on what constitutes their learning in L-CAS.
2. To evaluate the competencies of students that performed a consultation and developed an 3SAP.
3. To determine students' perceptions about the key aspects of the Medical Education capability model in the context of L-CAS namely: students' aspirations and their resources as well as their understanding of the

conversion factors that influence their capability set.

4. To determine students' perceptions of goal attainment of the aspirations they set for L-CAS and themselves.
5. To determine the students' perceptions about the key aspects of the DoFMUP capability model in the context of L-CAS, namely: relationships, identity and knowledge, disruptions and their reaction to the disruption.

Proposed follow-up investigation

Further work on the data gathered in this study will include coding of RRRs and independent coding of RRRs questionnaires by another researcher. This would serve as additional validation of qualitative data, and to ensure the reliability of the marks awarded by the researcher for the case reports. In addition, a focus group discussion could be conducted with current 5th and final year students to enlarge the number of students in the focus group and interviews. Further work will also include other role players in student learning for example CHWs, WBOT team leaders, support personnel at the DoFMUP and the L-CAS facilitator.

Chapter overview

Chapter I contains the thesis statement, background of the study and problem statement. The research question aims and objectives as well as delineation are discussed, and important concepts are defined as well.

Chapter 2 contains the literature review focussing on the capability models that were applied during the study.

Chapter 3 contains the methods where the research design, the methodology, the research instruments, the data management, the analysis, the ethical considerations and limitations of the study are discussed.

Chapter 4 contains the first part of the results namely the students' perceptions about their own learning and also the objective evidence from the evaluations of students' patient case reports.

Chapter 5 contains the results pertaining to the application of the data to the Medical Education capability model. Students perceptions about their resources, conversion factors and personal attributes are discussed.

Chapter 6 contains the results pertaining the application of data to the DoFMUP Capability model.

Chapter 7 contains the discussion in which results are triangulated and conclusions are drawn.

Chapter 8 contains conclusion. A novel model for learning in L-CAS is suggested.

Chapter 9 contains recommendations. Recommendations for further actions are proposed for the researcher, L-CAS team and faculty managers.

CHAPTER 2: LITERATURE REVIEW

Human development and the capability approach

Human development, quality of life and individual and community well-being, with an emphasis on the importance of financial and material resources, has been considered as central to all human activity.[9] The capability approach has offered a widely considered alternative to this theory of human activity, as research continues to show a lack of association between wealth and quality of life.[27,28]

Amartya Sen is internationally acknowledged to be the first to advocate and advance the notion of capability as central to human socio-economic development.[12,13] His interpretation of the evidence shows that a person's access to resources and the opportunities that person has to convert the resources to valued ways of living determines the person's quality of life and well-being.[9,10,29] The capability approach advocates the notion that people's well-being and quality of life depend on their opportunities to lead the life they think is important and to be the person they want to be.[29] The focus is on their ability to make their own choices and to put those choices into action, which is also a fundamental part of social justice. According to this model, resources and financial wealth does not equal quality of life. [9,11,29]

Sen also stresses the importance of collective deliberations in decision-making and action.[29] Choice and decision-making play an integral role throughout the whole process. It is noted that, because people internalize the formal and informal structures of a community, the rules and norms as well as the moral codes and values, it could be said that the judgment and choices people make are always collective. These adaptive preferences can influence and constrain an

individual at all the points in the capability approach, but reflective practice, with the view of understanding the preference and overcoming any constraints, could provide the individual with understanding of their influence. The notion of critical thinking (knowledge, experience, opinion, judgments, decisions, and positioning) has also been described as being central to young adults becoming capable agents.[29]

Reflection can aid individuals to look critically at their choices and evaluate these by understanding the limitations, to become more realistic when making decisions in the future. It is emphasised, for the capability approach, that the critical reflection needs a strong evaluator – meaning that the individuals make decisions based on their values, with cognition of the factors that are enabling or constraining their options.[9] Sen also points out that, for adults and children there are a whole set of freedoms that depend on the assistance and actions of others and the 'nature of social arrangements'.[28,29]

Capability has been used extensively over the last decade, as a conceptual framework in Economics and Human Development, to inform practice in education and increase social justice.[6,32,33,34,35] In higher education the concept of capability has also been examined and evaluated for its applications.[9] It focuses on individuals' freedom to make choices about how they wish to lead 'a valued life'.[9]

Within education, capability has been used primarily to engage in debate about the purpose of education, specifically in terms of issues of social justice and the need to develop individuals' potential to engage in a complex world. The philosophical assumptions that underlie the capability approach resonate with those of education in terms of 'progressive growth and development of the person, to enable meaning-making of complex situations and to use the new

knowledge and understanding to inform future actions.[9]

Model 1: Capability in medical education

The Lancet commission report urges all curricula to become more value based and less information driven, which highlights the focus of transforming medical education to meet the healthcare needs of the 21st century.[37] One of the core aspects of medical education is that it provides opportunities, not only for personal growth but also for professional development. The Lancet commission also highlights the importance of social justice in medical education, which needs to attract a wider range of cultures and social diversity. The capability model as described in figure 1, provides a framework for this new direction of thinking in medical education.[9]

The capability approach can be used to aid the medical education system in terms of the design, implementation and evaluation of educational interventions.[33] The way in which we structure our courses as well as the outcomes we set for each course are greatly dependent on our understanding of the competencies and capabilities we desire our student to have. How we think about the end product of our course, i.e. 'the capable professional', will determine how we structure our teaching efforts – the learning outcomes that we set – which, in turn, will influence the teaching and learning methods.[20]

At the heart of the capability model is the notion that a person is able to develop an understanding of what is important to him or her in terms of themselves and what they do or achieve, thus creating a capable being that extends beyond the classroom, into the future. Sandars and Hart adapted the capability model to describe capability in medical education.[6]

According to the Sandars and Hart model, resources are described in three categories namely: personal, social and environmental. The personal category is

divided into psychological (self-efficacy, tenacity, optimism, creativity and resilience); spiritual beliefs; educational (knowledge and skills); financial (wealth or access to wealth); health (good health and absence of disability); material goods (equipment and tools) and access to information. Social is divided into cultural, social resources and networks. Environmental is divided into location and weather.[6]

Aspirations are defined as the goals of the individual for their future, in terms of the self or in relation to others. Aspirations can help an individual to achieve well-being and quality of life through abstract thinking about the future. Conversion factors do, however, have an effect on the realisation of these aspirations.

The capability set is defined as the reality of the available capabilities (potential functionings) and opportunities of a person. Achieved functionings are the actual achieved well-being and quality of life of a person derived from the potential functionings, with the impact of conversion factors and choice.

Conversion factors are the things that can hinder or advance a person's agency or freedom to live a valued life. Conversion factors include personal attributes and the social structures within which an individual function. Personal attributes include talent, aptitude and education. The ability to convert resources into capabilities and functioning's are dependent on the conversion factors, which for our students act mainly through the educational system.[9]

Education can play a role in the development of capabilities in terms of increasing ability and opportunity by being a conversion factor that can enhance or constrain an individual's freedom and choice.[39,40] Dewey and Rogers both also stress the importance of the educator in facilitating growth and development in an individual.[38,39] The facilitative approach involves respecting the individual's freedom of choice, and challenge the individual to consider options and make

choices for future functionings. Within the capability model, the role of the teacher is defined as facilitator of the person to develop agency to make appropriate choices as an individual and for society.[9]

When planning a learning activity for adult learners, it is important to remember that adults have specific purposes in mind, are voluntary participants, require meaning and relevance, require active involvement in learning, need clear goals and objectives, need feedback and need to be reflective.[17]

Students' learning is always affected by their motivation. According to the self-determination theory, controlled motivation happens through external factors, like family expectations or rewards, as well as internalized beliefs about what is expected, while autonomous motivation happens through viewing the material as interesting or important. [17] Autonomous motivation in students leads to better understanding, increased performance and a feeling of competence. Thus, there is a greater chance of such students promoting autonomy in patients even if they focus more on their own self-determination.[17]

Sen advocates that there is no key list of capabilities and that each person should have the freedom to develop his own capability set. This offers a big dilemma for educators, especially in an environment where a specific set of learning outcomes, with evaluation of achievement of sufficient range and depth of a specific set of capabilities, is the norm. In response to this challenge, several methods for the selection of the appropriate capabilities have been suggested by different authors.[10,41,42,43,44]

Sandars and Hart propose a method closely related to Sen's. It highlights a person's freedom of choice for their well-being and quality of life. The process has three parts: 1) identify the unit of evaluation, 2) identify what is going to be

measured – measures of aspirations, potential functioning and achieved functioning can be performed through questioning or interviews or conducting focus groups, but they do not fully represent a person's capability set – the capability to aspire, to achieve and to identify conversion factors are also of importance, 3) decide whether the identified capabilities would be ranked according to importance.[45]

Robeyn identified five criteria that should be satisfied when deciding on a list of capabilities for any given specification, namely: 1) explicit formulation – the list should be defined, discussed and defended, 2) methodological justification – the method of drawing up the list should be clarified and scrutinized, 3) sensitivity to context – the level of abstraction should be useful within the context where we propose to use the list, 4) different levels of generality – taking into account the socio-economic and/or political feasibility, 5) exhaustion and non-reduction – the list should include all important elements.[44]

When using the capability model in the planning and execution of a course, the capability approach and transformative learning can be facilitated by awarding each student the opportunity to identify the capability set they want to develop during the attachment. Teachers' roles would be to facilitate reflection on the factors that enable and constrain the achievement of their potential functionings. Within the process it is expected that the world view of students is challenged.[45]

Reflection would play a central role in the students' agency and freedom to make their own choices for valued functionings.[39] The clinical activity can start by asking students to identify a comprehensive list of aspirations. The list can be refined to a list of potential functionings or a capability set to be developed, through a facilitated process of reflection. Freedom of choice is central. The facilitated reflection can focus on their own value system, personal attributes that

informed their choices and the realistic constraining factors. Goal attainment scaling can then be used to assign a score to each of the students' identified goals. This score can then be completed at the end of the clinical activity.[9,47]

Professional capability

There is general consensus in higher education literature that professional capability is much more than just the application of acquired knowledge and skill or being able to achieve a given task. Adaptability seems to be the key to this notion of capability. Adaptability is seen as being able to apply specific combinations of capabilities in different and changing contexts effectively.[19] Boyatis argues that 'superior performance' is a result of being able to manage complex contexts and interdependency while being innovative and having a self-directed focus on development of future capability.[31] The capable professional is described as being able to creatively respond to the unpredictable[21] and being able to confidently take appropriate action in unfamiliar and changing circumstances.[21] Professionals should also have the ability to develop themselves further.[19,20]

Drawing on the work of Argyris and Schon's notions of single and double loop learning, Stephenson argues that competence involves single loop learning while capability involves double loop learning, whereby practitioners are able to question their current understanding and assumptions and create and enact new responses to familiar situations, as well as respond effectively to new situations.[32]

Research methodology applied to medical education

Although the capability model is still relatively new to the field of medical education, a few well designed and rigorous studies that describe the process and methods of the application of this model to the field of medical education,

have been published. In the field of higher education and psychology, however, it is a well-researched topic.

A descriptive design study in higher education and psychology in Australia to investigate an action learning activity's potential to develop professional capability, grouped third year behaviour science students with junior students.[19] The evaluative questions, were: 1) does this design achieve its aim in contributing to the development of students' professional capability?; 2) which particular features of the design contribute to the student's learning processes and outcomes?; and 3) what are the specific challenges in applying or generalizing this type of learning design in other settings?

In this study the third years acted as process consultants to the junior client groups. The consultants had to negotiate entry into the group, contracting their services in relation to their task and effective functioning as a team. The junior clients had to develop, present and evaluate a skills training workshop, to their peers. Multiple sources were used to collect data quantitatively and qualitatively. Students kept reflective logs of their meetings, staff members kept notes of issues addressed and raised in consultations and of supervisory sessions. Third year students used the Study Process Questionnaire by John Biggs in this activity. Students answered questionnaires about their perceptions about the experience, their evaluation of the various components of the design and their perceived learning outcomes. Random interviews were conducted with a small sample of students.[19]

In another study, in the field of social work, to develop and test tools to evaluate capabilities in younger people, two topics of interest were developed namely: embeddedness, being a 'member', and critical thinking, 'a process that includes the use of knowledge, experience and education, as well as emotions and

imagination, to create one's own opinions and judgments, by which the person is able to reach decisions and a positioning in society.[30,31] In this study, each of the concepts were operationalised and questions were identified to measure the concepts. For example, people's experiences were measured through three questions: 1) achieved functionings (asking if the respondent went through one or more of a certain list of experiences), 2) lack of experience from an opportunity perspective, and 3) the level and type of impact of the experience. A questionnaire was then developed with statements defining the identified concepts. Students had to answer on a Likert scale between strongly agree, agree, disagree or strongly disagree. [30,31]

In the field of medical education, there are unfortunately not a lot of literature available. In the published studies both qualitative and quantitative measures are used. Unterhalter *et al*. state that measurement is one of the big challenges. They regard individual interviews as appropriate to understand individual functionings, triangulated with objective results like test scores.[46]

Evaluation of the Harvard Medical School-Cambridge Integrated clerkship also used both qualitative and quantitative data. Sources were focus groups, year-end marks, questionnaires to evaluate attitudes and perceptions, self-assessments, OSCEs and patient logs.[43]

It seems thus that it is currently accepted to use qualitative measures, supported by quantitative elements, to investigate capability in the field of medical education.

Model 2: The capability approach to learning

Students should be able to learn the whole curriculated time; wherever they are

and whatever they do. This could be in the hospital with the professor on a ward round, or in the home of a patient in an informal settlement with a community healthcare worker.[6] Students should learn from what they do and be able to turn that learning into future action and behaviour. Learning is thus seen as an ongoing process of maturation of the student, that leads to a change in the student's set of competencies. This process of learning is called the capability approach to learning.[6]

The capability approach to learning is defined as a state of being and a way of doing.[6] The state of being refers to the student confidently integrating knowledge and skills justifiably, with his motivation, commitment and value system. The way of doing refers to the student's application of competencies and potential abilities in an ongoing way, to different situations and contexts, through the process of active learning. Capability is described as being and doing and can therefore be shown.[6]

Capability will be evident when the student has confidence in his ability as an individual and in association with others, to take effective and appropriate action (set and appropriate 3SAP and plan), explain themselves to the patient or a third party (reflect on their work in a assignment), work and live effectively with others, and are able to learn continuously from their experiences in any situation in any setting. It would then, theoretically, be possible to assess students' development over time in terms of the accuracy and comprehensiveness of their assessment and management plans, when they practise workplace-based learning.[6]

Experiential learning or workplace-based learning mostly happens during informal learning in the workplace, reflective practice and interactive episodic contexts.[25,26] Knowledge that will become deep-rooted is often the knowledge that is created when problems are being solved.[26] It is fundamental to each

student's development that s/he learns from experience.[19] Learning depends on a student's abilities and competencies. These come from four major sources namely: their relationships and their beliefs about these relationships; their sense of self and their own identity; their knowledge and beliefs about the world and everything around them; and their mental and physical abilities.

Longitudinal attachments as a platform for experiential learning

L-CAS can be seen as a longitudinal integrated clerkship and it is therefore important for us to understand the learning process described in the literature regarding these clerkships. There is general agreement that the intended product of undergraduate medical education is a capable professional who is knowledgeable and skilful across the broad spectrum of medicine. According to experts this is difficult to achieve in traditional fragmented and highly specialized environments. Therefore, more and more schools worldwide are introducing longitudinal clerkships because of the added benefit these attachments offer in terms of teaching students professionalism, ethics, and a patient-centred orientation.[47,48,49,50]

Learning occurs when an individual reflects on an experience.[39] Through this process a working theory will be developed that will lead to action. This action will result in another experience and so the cycle continues. The cycle can be entered into at any point and the perception about the starting point will depend on the learning style.[13] Learning occurs by having an experience, but the experience alone does not produce learning – meaning-making is necessary.[14] Involving students in a process of experiencing situations that will challenge them to adaptively and robustly learn, is one way of meeting the challenge of preparing capable professionals.[19,50,51,52]

For learning to take place there needs to be a trigger, an observed or perceived gap or need.[6] For students to learn there needs to be a disturbance in their

equilibrium that will create uncertainty and a learning need.[6] Creating the need is not enough. The student needs to take action as a result of this learning need and that requires motivation and this motivation depends on the student's sense of value of that action. If a student is only motivated from an outside source like a learning objective, in a course that doesn't have meaning or value to him, he will not engage with the learning process, but when the perceived learning need speaks to his internal value system, it will be much easier for the student to move into action.[6]

The action that a student then takes depends on cognitive and metacognitive skills.[6] The student needs to understand his own understanding of his knowledge and abilities as well as his thinking about the process of acquiring new skills and knowledge. A student's review options can be facilitated through reading, reviewing and reacting.[6]

Bates *et al*[50] investigated the role of the environment and student relationships on their perceptions about assessment and feedback in a longitudinal clerkship. They used semi-structured interviews to gather data. Three main themes emerged from their findings namely that students valued the integrated and longitudinality of their assessment and continuous feedback. Secondly, they valued the relationships formed on the basis of the longitudinal attachment and thirdly the lang-term placement provided the opportunity for multiple assessment opportunities. Students that spend a longer period of time in a setting perceive their assessment and feedback to be authentic and embedded in daily work. Students also experience their assessment and feedback as constructive and supportive because they stem from valued relationships formed over time.[50]

In her article about the marginalisation of the clerkships in the UK, Brown describes the difficulties related to the clerkships. It relates to the reality of the clerkships being marginalised due to the perception about the disproportionate

importance of cognitive knowledge acquisition. They suggest early patient interaction for young medical students, with authentic case-based learning as a possible solution.[51]

Tim Dornan and his fellow researchers set out to describe the learning that takes place in a longitudinal clerkship because so little is known about what happens in the clinical setting with student learning. They concluded that students learn in a clerkship under three circumstances namely when they have support in relationships and interactions with fellow healthcare workers and colleagues, educational pedagogy in the form of precepting, instruction from senior doctors or observing senior staff, and from the organisation and curriculum. They related that most of the learning that takes place are so contextualised and tacit that it cannot be described as a set of competencies. Most of the learning takes place within relationships in relation to the curriculum.[52]

In her article about the opportunities that a community placement offers students in terms of learning about public health, Weston et.al. also describes the learning process as being vested in the doctor-patient relationship. They investigated the advantages of having medical students do a research project over the course of a year to learn about public health. They found the added benefit that students also learned about the community they worked in, as well as the people of that community.[53]

It is thus clear from the literature that longitudinal clerkships offer opportunities to learn and develop as professionals and individuals, provided that there are support in terms of relationships, learning and the curriculum.[50,51,52,53]

Reflection

The capability approach could be described as the consideration of available

options before you choose to develop capabilities and functionings, through a reflective process.[6,9] It is agreed that reflection is central to human development and meaning-making of situations. Dewey also grounded the reflective thought in the light of the basis of what we believe or know, as well as the further conclusions to which it can lead.[24]

Reflection is defined as 'a metacognitive process that creates a greater understanding of both the self and the situation, so that future actions can be informed by this understanding'.[17] Reflection is a critical part of self-regulated learning and lifelong learning, as well as the capability approach.[17] Reflection can be used in many different ways in educational activities and should leave space for the individual learners' preferences. It is important for the process to be guided by a mentor so that underlying assumptions can be challenged and tested.[13] Feedback is another important aspect of enhancing the reflective process. The trigger of the reflective process is usually an experience and the outcome is deeper understanding and new meaning-making.[17]

Schon describes two different kinds of reflection – reflection in action, reflecting during an activity, and reflection on action, reflection after an activity.[19] Reflection can happen before, during or after an encounter, with the advantage of approaching the activity with a specific goal when reflection also happens before the activity. It is very valuable if healthcare professionals have the ability to recognise their underlying personal values, beliefs and attitudes, and develop them further through reflection. Simply making sense of a situation will not be of meaning unless this new meaning has an impact on future behaviour and decision-making abilities.[19]

Implications for my study

The capability approach[6,9] is a relatively new concept in the field of medical

education but provides a framework for understanding students' learning and ability to adapt to an ever-changing environment and to carry new knowledge to future change. The role of critically evaluated reflection and experiential learning seem to be of importance in understanding the process.

The Sandars and Hart adaptation (refer to page 27) of the capability model will be used to identify and understand students' aspirations (including whether the objectives of L-CAS are part of their desired aspirations or not) and students' perceptions of the factors that enable them to achieve and those that hinder them from achieving those capability sets that they value or deem important. It will also help in evaluating the students' sense of attainment of these identified aspirations. It would be useful to understand the resources (as described in the Hart model) they use in terms of 1) personal – psychological (self-efficacy, tenacity, optimism, creativity and resilience); spiritual beliefs; educational (knowledge and skills); financial (wealth or access to wealth); health (good health and absence from disability); material goods (equipment and tools) and access to information, 2) social – cultural and social resources, for example recognition and networks, and 3) environmental – location, weather, etc.[9]

Measuring of evidence of learning in the context of the capability models is often complicated and one of the big challenges identified in the literature. Mixed method studies are mostly used. Sources such as individual interviews are seen as appropriate to understand individual functionings if triangulated with objective quantitative results like test scores. [45,46]

Methods to overcome the above-mentioned challenges in this study, are elaborated upon in the following chapter. A mixed methodology was used with multiple modalities of data gathering.

CHAPTER 3: METHODS

Introduction

The purpose of this study is to explore the application of two capability models in the context of L-CAS through the self-reported evidence provided by students. The outcome of the study should inform the future learning strategies in L-CAS. This study will thus provide data on the learning of students in L-CAS, which has not been investigated before (sensitisation) and build theory (conceptualisation) about the future learning in L-CAS.

This will be done by answering the research question: How does the application of the capability models support fourth year medical students' learning during and after L-CAS visits, in terms of performing a 3SAP?

This study is designed to provide insight into and understanding of how students learn before, during and after L-CAS activities, what influences their learning and how the program can be adapted to provide optimal opportunity for learning. Two capability models was used in this study, as a framework for the application of students' self-reported learning strategies. The consultation and 3SAP will be used as an objective measure of their performance over the course of a year.

In this chapter the methodology and data management will be described.

Research Design

This is a multi-component study that used an exploratory and descriptive design with qualitative and quantitative elements. The design takes into account the students' understanding of their own learning as well as factors influencing their

learning and the development in their capability over a period of time. This project have some elements of program evaluation but doesn't fit the definition completely and therefore investigated learning that took place over one year.

Setting, Population and Sample

All fourth-year medical students of the SoM of the year 2017 were invited to participate in this study. All students had to complete the reports and tasks as part of the fulfilment of the requirements for L-CAS, but only the data of the students who consented to the study was used in the analysis of this study. Informed consent was obtained from 269 out of the 278 students (97%). See also the section on Ethical considerations in Chapter 1.

The fourth-year students were deemed best positioned to assess growth in terms of their development of setting a 3SAP because they have the theoretical underpinning and patient exposure from previous years. They are the year group with the most frequent and also the most L-CAS visits in one year. Their tasks are also focused on individual learning.

The fourth-year class was divided into eight groups and each group rotated through eight clinical disciplines during the course of the year. Students had L-CAS activities during each of the rotations and a different objective for each of the rotations' L-CAS visit(s):

- Inter-professional rotation (one rotation): Students visited a clinic with an interdisciplinary team comprising of 11 disciplines. Students attended the morning meeting where one discipline presented a patient and all the other disciplines contribute to the planning and further management of the patient plan. Students then completed a report on the activities of the discipline they work with for the rest of the day and completed a report

with one patient write-up.

- Community site visits (three rotations): Students visited community sites and patient households with CHWs and complete a report with one patient write-up per visit. One visit was at a WBOT with the focus on the patient and his family; one visit at an old age home with the focus on chronic disease and two visits with a focus on specific high-risk groups like lesbian, gay, bi-sexual, transgender and intersex community (LGBTI), homeless people and drug users. For this rotation students had a sensitisation session at campus and then a community visit in central Pretoria.
- Consultation training (one rotation): Practical consultation training with peers in a small group discussion with a report on the learning that took place.
- Skills development (one rotation): Students had the opportunity to practise ENT skills on campus (students practised on peers). Students had to write a report on the learning that took place during the session.
- Palliative care (two rotations): Students visit community sites offering palliative care and interview the healthcare teams and patients. These activities will not be included in this study because students do not complete reports.

This study focussed on the perceptions of students about their learning and didn't include perceptions and evidence from the CHWs, WBOT team leaders and L-CAS facilitator.

Research instruments

Reflective Rotation Reports (RRRs)[54]

Students submitted a RRR after each of the clinical rotations (except for

the two palliative care rotations) as part of the requirements for the L-CAS module. The RRRs were handed in as hard copies to the Help Desk of the DoFMUP and uploaded to clickUP (a customised version of the Blackboard learning system that University of Pretoria's use) by each student individually. The hard copies of the RRRs from all the consenting students were used as data sources. Students were provided with a guide as to what should be included in their RRRs:

- How and what they learned from the activity
- How they can learn even more
- The challenges they experienced during the activity
- How they addressed the challenges they faced (read / review / reflect)
- Their commitment to acquiring the additional resources needed
- Their most significant learning experience
- Their reflections on:
    - How the activities of the visit changed their understanding of
        - The 3SAP
        - Primary care
        - The COPC principles

For the visits that had patient encounters a patient write-up was required with the following data:[54]

- The patient's personal history
- Available clinical data
- Information specific to the rotation they are busy with
- The results of the 3SAP of the patient
- A plan for the management of the patient, including how the disease can be prevented or detected early, managed properly and effectively and how the co-morbidities and disabilities can be

managed at the patient's home.

The qualitative analysis of the RRRs rendered the following broad framework of themes:

- All self-reported aspects around student learning: what students learn, how they can learn better and what helped them to learn, what challenged them and how they addressed the challenges.
- The knowledge, identity, relationships, disruptions, and the read / review / reflect method described by the students.
- Evidence of an accurate assessment (with available data) and an appropriate management plan, as described in terms of utilizing the different levels of the health care system appropriately and incorporating the principles of primary care and COPC.

The RRRs were also used by the researcher to complete the data sheets containing the scoring of the consultation competencies from every patient encounter the student had. It is important to realise that the patient cases are only written reports on students' perceptions of what happened in real life and cannot reflect the practical skills, only students' reflections thereof and the evidence presented by the student.

Data sheets: scoring of the consultation competencies[55]

Quantitative assessment of the consultation competencies presented in the RRRs of each student was conducted to establish change over time. The quantitative assessment was captured on a mark sheet developed and tested by the researcher. The list of competencies was derived from the competencies the DoFMUP use in their assessment of students. The marks were derived from the three crude levels of achievement: not competent (level 2), partly competent (level 3) and competent (level 4).

It is important to note that this study didn't set out to evaluate students' competency per se, but rather their capability i.e. whether they were getting more competent and able to apply previous knowledge and experience to new problems.

Students had to write up four patient cases during the course of the year along a framework provided to them. The framework included the history, examination, special investigations and 3SAP. The lecturer awarded a mark for demonstration of each consultation competency listed in Table 2. The possible range of marks was from a 0 to 4:[55]

0 = not applicable meaning that there were no patient cases for that visit as a result of the student not being able to attend the visit or no patients available for them to consult.
1 = the student submitted a patient case report, but the specific competency in question was not included in the notes.
2 = the student mentioned the competency but did not apply it to the patient or applied it incorrectly.
3 = the student included the specific competency and showed some evidence of understanding by applying it to the patient encounter, although the application was incomplete or misinterpreted.
4 = the student included the specific competency in question and showed understanding by applying it within the patient encounter correctly and completely, drawing conclusions from the application, for the management of the patient.

The consultation competency data sheets were used to look at the change of scores over time for the patient encounters that students reported on.

Focus group discussion

The planned focus groups, in the fourth year, could not take place due to the researcher experiencing unforeseen personal circumstances. It was decided to move the focus group to the final year (sixth year) of the students, as progress was deemed to be evident at the end of the academic programme. Eight students were randomly chosen and invited via telephone conversations by the L-CAS support staff for a focus group discussion. Only four students consented to the focus group. A reason for the low number of students might be that they didn't consider the focus group as important or necessary or were to busy with their final year rotations. One focus group was conducted at the DoFMUP to triangulate with the data from the RRRs. The focus group question was: How did you learn from the L-CAS activities in your fourth year? Exploratory questions followed as needed. The data was qualitatively analysed using grounded theory. Grounded theory is an inductive method of qualitative data analysis where the researcher start from a zero base generating and comparing codes as soon as data are generated. Theoretical sampling are used to fill gaps and uncertainties until theoretical saturation are reached, resulting in a substantive theory.[56] The product of the analysis was used to triangulate with the data obtained from the RRRs and Questionnaire to develop a new theoretical basis for the future planning of L-CAS.

Semi-structured interviews

The planned semi-structured interviews, in the fourth year, could not take

place due to the researcher experiencing unforeseen personal circumstances. It was decided to move the interviews to the final year (6th year) of the students, as progress was deemed to be evident at the end of the academic program. After the scoring of consultation competencies was completed, a list was compiled of all the students that did show evidence of improvement, in their RRRs, over the course of the fourth year. Eight students were invited but only two semi-structured interviews were conducted at the DoFMUP with the students that consented to the interviews. A reason for the low number of students might be that they didn't consider the focus group as important or necessary or were to busy with their final year rotations. The question was: How did you learn from the L-CAS activities in your fourth year? Predetermined exploratory open-ended questions followed as indicated. The data was qualitatively analysed using grounded theory.

Questionnaire on the two capability models

The researcher administered a questionnaire (see appendix 3), from the identified aspects of the capability models in the literature.[6,9] This questionnaire was custom developed by the researcher and administered in the beginning of the fourth year during each of the L-CAS orientation sessions, and again at the end of the fourth year during the L-CAS feedback session to all of the L-CAS groups. This questionnaire was validated by a literature search regarding the two capability models and consultation with lecturers from the DoFMUP, and a pilot study with students. The pilot study was conducted with randomly chosen fourth year students answering the questions and commenting on whether the questions are clear, unambiguous and the length of questionnaire. No questions were changed, removed or added.

The researcher facilitated the answering of the questionnaire through discussion and explanations, although each student filled in the questionnaire independently. Students didn't have access to the beginning of the year questionnaire when they filled in the end of the year questionnaire but could peruse both questionnaires after completion. The questionnaire consisted out of open-ended questions and questions pertaining to the capability model attributes identified from literature with a Likert scale. A Likert scale was used because the scale was developed to test attitudes of participants. It is the most widely used scale to test attitudes. The scale allows participants to indicate how much the agree or disagree with a statement.

This questionnaire posted questions on students' perceptions of their:

- Aspirations – Students were asked to name up to ten of their personal aspirations and to rate them regarding importance. The identified aspirations could be professional or personal. Students were also asked to name up to ten aspirations they had for L-CAS.
- Attainment of the aspirations.
  Students were challenged to indicate how far they have progressed in achieving the aspirations. Students had to score themselves on a scale as follows:
    - Score 1: Student just identified the aspiration
    - Score 2: Student has identified the resource(s) needed to achieve the aspiration, in other words started planning
    - Score 3: Student started to acquire the resource(s) needed to achieve the aspiration, in other words action begun

- Score 4: Student achieved some part of the aspiration
- Score 5: Student achieved most of the aspiration
- Score 6: Student achieved the aspiration fully

- Further analyses were performed on complete cases (cases where students completed a beginning of the year and an end of the year score for the aspiration mentioned). The paired t-test was employed to compare mean (SD) ratings of goal attainment (rating of 1-6) of the five most reported aspirations.
- Their resources – personal, social and environmental. Personal attributes include talent, aptitude and education. Students were asked to name as many personal, social and environmental resources they consider as important in their attainment of aspirations, as they wanted to. Personal resources meaning anything that they need or use personally to achieve their aspirations. Students were asked to rate the significance of the personal-, social- and environmental resources named in the literature in their own lives with four being very significant and one being not significant at all, and to comment qualitatively on each resource named in the literature in terms of significance in realizing their aspirations. Culture, as a social resource, is not defined in terms of culture of the institution or social group or individual.
- Conversion factors: Conversion factors include personal attributes and the social structures within which an individual function. Students were asked to think about the conversion factors named in the literature and the impact of those factors on their aspirations. Students were firstly asked to think about their own personal attributes, and secondly to think about social structures, policies and programmes, laws and cultural patterns. Students were asked

to quantify the impact of the conversion factors, named in the literature, on the achievement of their aspirations in terms of enabling or constraining them. They had to score each factor out of four, with four being very significant and one being not significant at all. Students were also asked to comment qualitatively on each of the factors in terms of significance in realising their aspirations.

- Students' knowledge: In the questionnaire students were asked to comment on their own knowledge at the beginning of the year and again at the end of that year. Themes were identified. In each theme all the different responses were recorded until saturation was reached i.e. no new responses were noted.
- Students' identity: In the questionnaire students were asked to comment on their identity, at the beginning of the year and again at the end of that year in terms of confidence, motivation and values and beliefs. In each section all the different responses were recorded until saturation was reached i.e. no new responses were noted. In the questionnaire, students were asked to rate themselves (out of 10 and 10 being the highest score) at the beginning of the year and again at the end of the year in terms of their confidence in setting a 3SAP, their motivation to use it in a consultation, their self-efficiency in practically applying the 3SAP and whether they believe that they can do a 3SAP. At the beginning of the year nine students did not fill in this question and at the end of the year 15 students did not complete it.
- Their relationships: Students were asked to comment on their relationships in general as one of the open-ended questions of the questionnaire at the beginning and end of the year. Main themes were identified.

The questionnaires were quantitatively and qualitatively analysed.

- All the Likert scales were quantitatively analyzed to identify the mean values as well as to look at the goal attainment scores. The number of responses for the different resources was also recorded.
- The main themes from the qualitative data identified were the aspects from the two capability models and the students' perceptions about their learning.

Field notes from the researcher

I made some notes to myself about the type of questions students asked during the completion of the RRRs.

The Data

The data was captured electronically by the researcher on excel spreadsheets and the original hard copies are kept in the DoFMUP. Transcription of recorded focus groups and interviews were done by the researcher and electronic copies are also kept in the DoFMUP.

Researcher characteristics and reflexivity

I am one of the founding members, and was the project manager, of the L-CAS Programme from the start in 2008 which gave me a deep understanding of the opportunities, challenges and finer details of the program from the start. L-CAS has always been a priority, but we spent so much time and energy on the management, organization and solving of day-to-day challenges of the programme, that doing the research has never been realised. What students actually learn as a result of the L-CAS activities, and how they learn, has never been researched and fully understood. Personally, I always wanted to

understand the negativity that sometimes surfaced around the activities. When my role in the Department of Family Medicine (DoFMUP) changed in 2016, and I wasn't as involved with the day to day running of the Programme, I saw the opportunity to research L-CAS activities and student perceptions. The fact that I didn't take part in any of the assessment activities of L-CAS, but still have a deep understanding of the Programme and organisation, put me in the ideal position to examine student responses and behaviour. During the analysis of data I discussed the findings with the current L-CAS facilitator to deepen the understanding and interpretation of findings. Data were compared within and across cases to establish common findings and to allow for the exploration of contextual meaning. Thus, comparisons across cases aided in identifying exceptions and common findings.

I needed to consider the way in which my own background and involvement with L-CAS could induce bias in face-to face interactions with the students. To ensure that fair dealing took place to reduce bias all fourth-year medical students were invited to participate in the study. Although the main objective of the data analysis was to identify main themes, careful attention was given to individual accounts relating to specific incidents. The researcher that conducted the focus group discussion and the interviews, and I were both mindful of the stress or anxiety that the participants may be experiencing with the disclosure of adverse events and with experiencing negative feelings. Researchers took time to make sure participant didn't feel stressed or anxious about their participation.

Security of data

The security of the data is important with respects to storage of hardcopy documents and computer files. All paper-based and electronic data were stored in the DOFMUP and all computer files were password protected.

Qualitative Data analysis

The focus group discussion and the interviews were conducted by an independent female researcher known to myself and not connected to the program or students in any way. She is a physiotherapist and was also busy with her PhD studies at that stage. She completed her SAFRI fellowship and had reasonable experience with qualitative data collection methods. Participants didn't know the researcher nor did they have any relationship with her.

The datasets were not used to look at capability for individual students but rather at the group as a whole.

The researcher transcribed the data herself electronically. I used Excel spreadsheets for all the data. I was engaged with the data over a three-year period and deeply emerged with all aspects of the data, to form a broad and deep understanding. Throughout the process the data was discussed with the L-CAS facilitator (a colleague) and to deepen my understanding even more.

The Framework approach was used for the qualitative analysis of the data from the RRRs and questionnaire. In some cases, content analysis was used to quantify responses:[49] The framework approach entails the following:

- Familiarization: the researcher immersed in the raw data by reading and re-reading the reports and questionnaire answers after it was electronically captured in excel. The purpose of this first step is to identify main themes and key ideas.
- Identifying a thematic framework from the themes identified. This is done by drawing from the aims and objectives as well as issues identified and mentioned by the respondents. The outcome of this step is a breakdown of data in manageable groups for easier retrieval and understanding

- Indexing: this is the stage where the thematic framework is systematically applied to the data in order to identify all themes addressed in each response. Numerical codes or words can be used.
- Charting: at this stage the data is re-arranged into the framework to form a map or chart. This phase of the data analysis involves a lot of synthesis and abstraction as it contains distilled summaries or views and experiences.
- Mapping and interpretation: the charts are now used to define the concepts and map the range and nature.53

Coding of concepts was used. Codes are words or short phrases that represents a body of language-based data. The goal is to move from the raw data to a synthesis of the data that answers the research question. Phrases and responses that are linked to the Research question and Objectives were identified and noted, identifying recurring patterns.[62]

In some cases, content analysis was used to quantify responses.
Content analysis is used to look for certain words, phrases or concepts within the data set. Patterns in communication are observed by qualifying frequency of use of words, phrases and concepts and by seeking to understand and explore meaning and relationships, ultimately leading to the formulation of conclusions and making a decision about the message of the data, even of the context, culture and time during which the data was collected. [54]

Negative cases and non-affirming evidence are presented as well.

Triangulation was used to increase validation of the data. Triangulation happens when the researcher gets different perspectives or evidence for the same issue

under investigation and thus allow for a better and more comprehensive understanding and increase the confidence of the researcher.[67]
Trustworthiness of data was obtained through the following strategies:[60]

- Understanding the population.
- Conveying the data analysis process
- Reconstructing data collection memories and being open to change
- Comparing themes with the current L-CAS facilitator
- Incorporating member checks into the data analysis

Trustworthiness can also be divided into credibility (internal validity), dependability (reliability), transferability (external validity) and confirmability (presentation).[61] In order to insure rigour and trustworthiness this study employed member checking, triangulation, detailed transcription and had a systematic plan and coding.

Quantitative data analyses

The purpose of the data interrogation and statistical analysis was to:
Quantify mastery of individual competencies in the group of students as a whole by excluding "0" scores, where 0 = not applicable – there was no patient encounter as a result of the student not being able to attend the visit or no patients being available for them to consult – and calculating Mean (SD) values for the four consecutive patient encounters (reported in Table 6), We chose to use the third patient encounter as an encounter that was deemed to best reflect professional growth over encounters due to the fact that a significant number of students did not attend the last encounter, mainly due to logistical reasons.

- Ascertain the frequency (%) of students that had achieved competence in at least one of the patient encounters for each of the competencies, following dichotomization of level of mastery (non-competent: scores of 1,

2 or 3 compared with competent: score of 4), (reported in Table 7). We chose to use the 3rd patient encounter as an encounter that was deemed to best reflect professional growth over encounters due to the fact that a significant number of students did not attend the last encounter, mainly due to logistical reasons.

- Assess the association between patient encounter and level of mastery of a given competence using the chi-square test, (reported in Table 7), and
- Evaluate actual change observed in learning or achievement of mastery within clusters of related competencies by comparing cluster scores between encounter one and encounter three employing the Kruskal-Wallis all-pairwise comparisons test at an alpha level of 0.05.
- The competencies were clustered to make the analysis more focused, and to allow the addition of other quantitative tests.
- Pre-post goal attainment of aspirations were analysed.

Ethical considerations

All participants signed voluntary informed consent. Students had the opportunity to withdraw from the study at any time and were not penalized in any way if they did not answer all the questions. Although it would be possible to link a student to the results, only the researcher would be privileged to this information. Students' evaluation in L-CAS was thus unbiased because as far as knowing the students' identities were concerned. Support was made available to students as and when needed for debriefing and referral as appropriate. No student made use of this opportunity.

The PhD committee as well as the Research Ethics Committee of the Faculty of Healthcare Sciences of the University of Pretoria accepted and approved this study (protocol ref nr. 82/2017 page 6)

Confidentiality

Confidentiality was considered and maintained throughout the study. The Students RRRs were numbered independently of their student number and grouped together (with the same new number) from the first to the last RRR handed in. The selection of students for the focus group followed 18 months after evaluation of the RRRs. A number was awarded to each student and the RRRs were numbered as they were handed in, in terms of first, second, third and fourth and marked with the student's allocated number and number of RRR. L-CAS is evaluated only in terms of successful completion of all activities. Participation in this research therefore did not influence students in any way. Participants were able to see their own questionnaires (completed at the beginning of the year) after they completed the questionnaires at the end of the year. Students had access to their RRRs throughout the process.

Delineation and Limitations

- This work focuses on fourth year medical students and follows their progression over one year.
- Due to factors outside our control (strikes, safety issues, etc) some students could not attend all activities and therefore couldn't complete patient records for those visits
- The knowledge generated might not be generalized to the other training institutions and other groups of students.
- Subjectivity of the researcher and participants can influence the data. This was minimised by discussing the data and understanding of the data with the current L-CAS facilitator and triangulating the various data sources.
- It is important to realize that the patient cases are only written reports on what happened in real life and cannot reflect the practical skills, only students' reflections thereof and the evidence presented by the student.

- Although 97% of the students in the fourth year gave consent for their RRRs, consultation data sheets and questionnaires to be used, a number of the RRRs and questionnaires were incomplete. The length of the questionnaire and RRR could have played a role in why students did not complete them in full. Due to logistical difficulties (strikes, uproar in the communities and public holidays) some of the patient encounters could not take place and students could not fill in a RRR for that L-CAS activity.

Summary

Table 4 represents the alignment of the aims, objectives and methods of the study. In the next three chapters the results will be presented.

Table 4: Alignment of the study aims, objectives and methods

Aim	Research Objective	Source of data and Data Collection Methods	Output	Data Analysis
To describe fourth year medical students in terms of their current learning behaviours and evidence of learning	To determine student's perceptions on what constitutes their learning before, during and after L-CAS activities.	All participants - RRRs Written text electronically captured into excel.	Identify and evaluate students': - Evidence of learning that took place - The factors that enabled them to learn and what they need to learn more - The challenges they faced in terms of their learning - Students' understanding of o the 3-stage assessment, o primary care o COPC principles.	Qualitative analysis – framework approach
		Purposefully selected students that showed capability in the consultation and 3SAP - Semi-structured interviews. Voice recording transcribed into text.	Deeper understanding of: - process of learning - learning behaviours - enabling and hindering factors	
		Purposefully selected students that showed little capability in the consultation and 3SAP - Focus group interview. Voice recording transcribed into text.		
	To evaluate capability in fourth year medical students specifically in terms of the development of an appropriate three stage assessment and management plan for a patient, over one year of L-CAS activities.	Data capture sheet for each student with the patient write up from their RRRs x 4	Evaluation of competence to set an assessment and plan and the development of the competence over time, recorded on the data capture sheet numerically as a 0 - 4	Quantitatively - Descriptive statistics

Aim	Research Objective	Source of data and Data Collection Methods	Output	Data Analysis
To apply the two capability models to the reported learning behaviours and evaluate both the models	To determine students' perceptions about the key aspects of the Sandars and Hart capability model namely: students' capability sets and their resources as well as their understanding of the conversion factors that influence their capability set.	All consenting Students' questionnaires during orientation (beginning of year) and feedback (end of year)	Identify students': - aspiration - own understanding of resources - own understanding of their conversion factors	Quantitatively – number of students that identified specific elements Quantitatively - framework approach
	To capture students' perceptions of goal attainment of their capability set.		Attainment score (of the capability set) beginning and end of year	Quantitatively - descriptive statistics of attainment scores
	To determine the students' perceptions about the key aspects of the Family Medicine capability model namely: relationships, identity and knowledge, disruptions and their reaction to the disruption.	All consenting Students' questionnaires during orientation (beginning of year) and feedback (end of year)	Identify students': - Own understanding of their knowledge - Own understanding of their identity - Own understanding of their relationships Identify the perceived impact of knowledge, identity and relationships on each students' ability Identify the change over the year if any	Quantitatively – descriptive statistics Quantitatively - framework approach
		All Consenting students' RRR	Identify - What challenged them the most during this visit - How did you address the challenge you faced? Read / review / reflect - Commitment to acquire Additional resources needed	Quantitatively - framework approach

CHAPTER 4: RESULTS

STUDENT PERCEPTIONS ABOUT THEIR LEARNING AND EVIDENCE OF LEARNING THAT TOOK PLACE

Introduction

This chapter will focus on objective 1 and 2 namely:

- To determine students' perceptions about their own learning in L-CAS.
- To evaluate the competencies in fourth year medical students, who will be required to perform an appropriate 3SAP for a patient.

Objective 1

To start, we will address the first objective namely how students perceive their own learning, and all the related aspects around their learning. The main themes as well as sub-themes with supporting quotes are tabulated.

Self-reported learning that took place

Students' written reflections in their RRRs, the focus group as well as the interviews were used as data sources. The main themes and sub-themes that emerged from the data sets are:

- Students learned the importance of listening to patients
    - When you listen it will enable the patient to provide information
    - When you listen it will deepen your understanding of the patient
- Students improved communication by interacting with patients
    - It became easier to enable patients to tell their story

- You learn what questions to ask and how to ask them
- It becomes easier to correct any misunderstanding or misconception that the patient might have
- You get to give health talks – and answer a patient's questions

- Students improved clinical skills by interacting with patients
  - You learn to deal with patients with special needs
  - Your interview skills improve
  - Your teamwork skills improve
  - You learn how to work with a translator
- Patient interactions improve clinical knowledge
  - When you interact with patients it enables you to look holistically at the patient
  - Patient interactions give you the opportunity to revise your knowledge
  - Patient interactions expose you to the rest of the medical team
- Students understood the context of the patient better
  - Being in the community and experiencing the everyday life of a patient helps you to understand the patient better
  - Interactions with patients expose you to the different languages of the patient
- Students' knowledge and understanding of the healthcare system improved
  - Interactions with patient show you how the healthcare system functions and the effect that it has on the patients
- Learning about the self
  - I have to face my own challenges
  - I realise my own accomplishments
- Students' understanding and knowledge of Primary care increased
  - Working in the primary healthcare sector helps you to see the importance and use of risk assessment and screening for each population.

- Working in the primary care settings make you realise the importance and use of prevention and promotion in each population.
- Being part of the primary care setting highlights the importance and use of patient education.
- Working in the clinics makes you realise what the impact of primary care is on patient management.

- Students' knowledge and understanding of COPC improved
  - Being in the communities make you see the importance of the community and social circumstances of the patient, in the management of the patient and the community.
  - Being part of the healthcare team in a community offers opportunity to grow as a professional.
  - COPC highlights the importance of teamwork.
- The application and use of the 3SAP improved
  - The 3SAP gives you a general approach to the patient – it helps you to know what to ask.
  - The 3SAP helps you to fully understand the patient and his/her life.
  - The 3SAP helps you to understand how the individual and contextual aspects of the patients' lives can influence them.
  - Your understanding of the 3SAP can benefit the patient.

Table 5 (see Appendix 2) contains each main theme and sub-themes with supporting quotes. Quotes can be linked to specific sub-themes, but are reported as a cluster related to the main theme.

Table 5: Main themes and sub-themes with supportive quotes of students' self-reported learning

Theme	Sub-theme	Supportive quotes
The importance of listening to a patient	When you listen it will enable the patient to provide information	*I think I realised that I need to listen more carefully and not just run through the list of questions that I need to ask. It is about gaining information, combining the information and using that information to guide further questions.* *Q21* *With the patient I have learnt how to listen and have empathy for what she has told me. I learned to obtain a thorough history as well as gain adequate rapport with her.* *Q203* *It helps you to make the patient feel more comfortable* *FG1*
	When you listen it will deepen your understanding of the patient	
Interaction with patients improve communication skills	It became easier to enable patients to tell their story	*I practiced how to retrieve information from a patient, which relevant questions to ask, and to think while the patient is giving you info.* *Q201* *I learned the importance of giving your patient information and ensuring they fully understand their disease and have an accurate idea of their state of health.* *Q177*
	You learn what questions to ask and how to ask them	

Theme	Sub-theme	Supportive quotes
		This honestly helped me work better with people I don't usually work with, and now I find it easier to work with different people. Q25
	It becomes easier to correct any misunderstanding or misconception that the patient might have	*As students it's easy to get caught up in accomplishing the task at hand and being preoccupied in obtaining the information required within the short time allocated. Often when dealing with elderly patients who may not have company very often, the conversation tends to stray from the questions asked to other irrelevant info but it is important to practice patience and listen to the patient with interest and empathy so as to put the patient's needs before my own.* Q184
	You get to give health talks – and answer a patient's questions	*I also learned how to work with people with a language barrier and how to respect people's privacy and patient autonomy.* Q265
		I still need to read up more about the actual diseases so that I can give the patient answers when they ask questions. Q178

Theme	Sub-theme	Supportive quotes
Interaction with patients improve clinical skills	You learn to deal with patients with special needs	*I learned a lot about how to interview a patient with a disability and be sensitive towards them.*[Q191] *You can help the patient to be more compliant.*[FG2] *To get the knowledge needed. I realised how my lack of knowledge hindered me from taking a good medical history. I think I missed a lot of signs and symptoms due to my lack of knowledge regarding certain diseases. Taking the History was very time consuming as we weren't 100% certain on which aspects to focus on and we also didn't have a good structure worked out of how to do it.*[Q175] *Going to the old age home enabled us to practice the knowledge we have gained theoretically and helped in gaining confidence as a medical student when faced with a patient individually.*[Q202] *Even though I battled with the language luckily I did the interview with a colleague of mine who is fluent in Afrikaans so*
	Your interview skills improve	
	Your teamwork skills improve	
	You learn how to work with a translator	

Theme	Sub-theme	Supportive quotes
		we could form a relationship with our patient.[Q194] *We worked well as a team as are well acquainted and tolerant of each other's weaknesses and aware of each other's strengths and are able to function as a comprehensive unit, allowing each member to build up another and develop personally simultaneously.*[Q184] *We learnt a lot in terms of how to interact with patients especially through a translator which proved to be quite challenging. We read up on TB and HIV which helped us academically and for future cases when we will be exposed to something similar and can refer back to this experience.*[Q75]
Patient interactions improve clinical knowledge	When you interact with patients it enables you to look holistically at the patient	*The whole patient – from beginning to end of consultation. Nowhere else in the curriculum do we get to deal with the patient from community to hospital and back to community... tertiary training is very compartmentalized.*[I1]
	Patient interactions give you the opportunity to revise your knowledge	*I was able to refresh my knowledge on the 3SAP and*

Theme	Sub-theme	Supportive quotes
		revise and improve my knowledge on Hypertension.[Q177] *Learning about interprofessional relationships between different disciplines and how they blend in to make a functional team. I learnt how to test the functioning of the diabetic foot.*[Q5] *I found this session beneficial, although largely controversial, as it opened my eyes to a completely different way of life and individuals with contrasting lifestyles to my own. I gained much knowledge into areas I was previously ignorant about which will ultimately make me a better clinician.*[Q89]
	Patient interactions expose you to the rest of the medical team	
Understanding the context of the patient	Being in the community and experiencing the everyday life of a patient helps you to understand the patient better	*It was also a learning experience being in the township and having to interview and examine her in that setting. I had the opportunity to practice and learn new phrases in Sepedi as well as history taking and how the community functions.*[Q21] *I learnt the workings of an old age home better and how the*

Theme	Sub-theme	Supportive quotes
	Interactions with patients expose you to the different languages of the patient	*system of care works for each patient.* *The most significant learning experience of the day was being able to see a patient in a setting other than a hospital or clinic because it provided us with some contextual information that you cannot always get in the hospital setting. The patient found it more comfortable in their own home and thus found it easier to engage with us and provide relevant info. We learned to do a health assessment on a patient who was not acutely ill or did not have any current complaints so we had to have a broader approach to the patient. We also focused on history and examination specific to the elderly which is esp. important in training to be a general practitioner.*Q41
The healthcare system	Interactions with patient show you how the healthcare system functions and the effect that it has on the patients	*I was also made aware of the inadequacies of the public sector in medicine distribution and effective prevention of preventable chronic conditions.*Q187

Theme	Sub-theme	Supportive quotes
		I learned a lot about the need that people have to good healthcare in rural areas and the struggles they face getting to a health care facility if they don't have the money or means to do so. Q265 *I learned that CHWs have a vast knowledge about the inner working of the community, and that I had to build a relationship with them to have access to this knowledge.* Q215 *It was a very valuable lesson for me as a black female in a developing country. I learned that one can have access to hospitals and clinics, but if the social circumstances are not good all the treatments in the world will not improve a conditions that is as equally reliant on the social setting to improve. Conditions like TB and HIV in SA are social diseases and need social-related solutions, medical treatment, although useful and valuable, will not eradicate such diseases. It is also important to treat each

Theme	Sub-theme	Supportive quotes
		*patient equal and allow them to have the same access to health care as the more affluent and better of patients. This group of people is in greater need to good healthcare than more affluent people.*Q30
Learning about the self	I have to face my own challenges	*I did learn many new things about myself and about the society we live in. If anything it made me more and more aware of my privilege in this country.Q58*
	I realise my own accomplishments	*I also realised that my history taking becomes more structured and takes less time to do than initially.* *I have learnt to be a more hands on student when it comes to my education because if I do not take every opportunity around a patient as a learning experience I won't be as good a doctor as I want to be. I have learned to work in a group, to listen to many people's opinions if I honestly do not understand, and especially the importance of seeing a patient in a holistic manner.*Q25

Theme	Sub-theme	Supportive quotes
		*I found myself to be insensitive and this gave me a understanding on what I should work on to improve my consultation.*Q22 *I learned that the most important thing when entering another family's house is respect, regardless of what race or culture they are. Our CHW taught me that respect is universal and is appreciated by everyone regardless of colour and creed.*Q241 *We definitely saw that we were lacking the skills to get the necessary information from the patient.*Q195
The Three stage assessment	The 3SAP gives you a general approach to the patient – it helps you to know what to ask.	*I am aware of how the 3stage assessment will be beneficial to us throughout our medical careers and I only used the ICE acronym now for the first time. I see that it can also affect an illness' progression and impact on a person's life.*Q188 *Today I learned that the patient's ideas about an illness or disease can influence the way they deal with it. It is our responsibility as*
	The 3SAP helps you to fully understand the patient and his/her life.	

Theme	Sub-theme	Supportive quotes
		health care professionals to change these ideas and educate the patients on how they can manage their diseases.[Q201] *The 3sa is a wonderful tool to use to make sure you get the full picture of the patient's life and not just the disease he suffers from.*[Q195] *I learned the importance of looking at a person and their disease individually- what affects them might not affect someone else and vice versa. I also learnt to listen to how a disease might affect a person's life and to make sure they have the necessary support.*[Q175] *This experience provided me with an understanding as to why this assessment is important and provided me with an opportunity to practice using the assessment when taking the history of a patient and formulating the management plan.*[Q195] *It helped me to see the relevance of the 4c's of Chronic disease and the 3stage assessment in the patient setting and made me*
	The 3SAP helps you to understand how the individual and contextual aspects of the patients' lives can influence them.	
	Your understanding of the 3SAP can benefit the patient.	

Theme	Sub-theme	Supportive quotes
		*consider the importance of how the patient's perception and ideas of disease can affect their health, recovery, compliance and management plan. It was also made clear that the omission of these assessments by the doctor could lead to patient mismanagement.*Q184
Primary healthcare	Working in the primary healthcare sector helps you to see the importance and use of risk assessment and screening for each population.	*Primary Care is very helpful and very intimate. At this site, the patient pointed out that doctors visited them and there are nurses who gives them their medications and check their vitals. Therefore should there be any problems they are picked up early and can be attend to earlier, preventing complications.*Q202 *I realised the importance of Primary Care and the big effect the prevention of disease can have on a person's life.* *The importance of Primary Care was illustrated as my patient and others often did not have an accurate idea of their disease and health and these patients*
	Working in the primary care settings make you realise the importance and use of prevention and promotion in each population.	
	Being part of the primary care setting highlights the	

Theme	Sub-theme	Supportive quotes
	importance and use of patient education.	*should receive adequate Primary Care to correct this fault.*[Q177] *We were able to see first-hand how the nurses take care of the people living there by providing them with their medication daily. The staff also takes care of the people by giving them meals every day.*[Q178] *I believe her disease could be prevented by early diagnosis and prompt management. This will only be achieved by successful patient education and screening of the population at risk of developing chronic diseases such as Diabetes. My interviewing and consultation skills are improving and I feel that being able to interact with patients on a personal and comfortable level is very important in the holistic care of patients.*[Q205]
	Working in the clinics makes you realise what the impact of primary care is on patient management.	
COPC	Being in the communities make you see the importance of the community and social circumstances of the patient, in the	*I incorporated the COPC principles and became more aware of health care being linked to social circumstances. In COPC, there are health specialists and community*

Theme	Sub-theme	Supportive quotes
	management of the patient and the community.	*members who collaborate and take time to treat patients. I am learning how to adapt my approach to managing diseases taking into consideration the social background of patients.* Q190 *COPC helps develop us as students as we get to tell others, be it as a group or individuals on different aspects of health.* Q202 *The COPC principles definitely enabled us to engage in our environment the right way. We explained everything that we were doing and the nurses helped us and we all worked together which is the point of COPC.* Q194 *It was nice to see how the different health care professionals work together to ensure that the patient's got all the necessary treatment and help.* Q175
	Being part of the healthcare team in a community offers opportunity to grow as a professional.	
	COPC highlights the importance of teamwork.	

What enabled learning?

From the data sources a list was compiled of all the different learning strategies that students mentioned with supportive quotes for each. Students reported the following aspects as enablers of their learning; or could enable their learning in the future:

- Students learned by participating in all the settings.

  We learn through experience. The more exposure I get and the more history I take the better I will become.[Q175]

  More interaction with patients at the primary healthcare and community level will increase the scope of understanding about COPC principles and how to effectively pick conditions at a Primary Care level and manage them before they progress.[Q28]

  We also had a role-play of two of our students. From that we were able to point out the do's and don'ts in a consultation. This added positively and greatly on my existing knowledge of how consultations should proceed.[Q54]

  I learned by taking the residents history and by interacting with the resident and trying to build a professional relationship in which she felt comfortable.[Q42]

- Being in the context of patient aided the students in understanding of a patient.

  Thinking about the questions you ask for example – do you have running water, electricity – only when you see that they have to collect water from the community tap you understand what that questions entails.[I2]

- Observing and participating with senior students benefitted the students.

  The most significant learning experience of the day was being able to observe the fifth-year medical students take history and examine patients. I found this to be very helpful because the students were more understanding of the level of knowledge and experience, we have at the moment and thus could teach us at a pace that was suitable to us. We were also able to see what is expected of us in a year's time. We learnt how to do a thorough clinical examination in a more directed way so that we are eventually able to give a concise list of differential diagnosis. We also learn how we are expected to record and present the information that we have gathered.[Q41]

- Students found it very useful to observe their peers.

  I also learned by watching my colleagues interact with other residents of the Old Age Home and seeing how the elderly patients respond to them.[Q42]

*This was a rather difficult situation to be put in on the first day to even do HIV tests. I was very grateful for Prince in the room with us and I listened attentively to how he managed the situation and how he counselled the patient so that I might do the same in the future.*Q74

*While at Daspoort we observed how kind and willing to assist the SIC (final year) students were. They carried themselves professionally and we did likewise.*Q3

- Students learned a lot by observing a doctor consult with a patient. *One thing that I found extremely inspiring and compelling was her approach to the patient. She showed great deals of empathy towards Mrs. P and always let her finish speaking before asking further questions. Her open ended questions prompted full responses and she was quickly able to develop rapport.*Q38

  *After the visit I spent some time searching the internet about some of the examination techniques that I witnessed as well as the findings of our examination so that I could further my understanding and link it to some of the knowledge that I have already gained as I know the importance of continuous learning; by practicing what I observed with my own patients. Initially it might be beneficial to do it in small groups so that we can assist one another and learn from each other but later on it would be helpful to practice on my own……after the visit I spent some time reading about signs and symptoms, physiology and management of heart failure especially in the elderly.*Q41

- Presenting the patient to a facilitator that gave feedback.

  *Upon clerking the patient and setting up a 3 stage assessment, we presented to our supervisor who critiqued it and corrected us as needed. Thus in that way we learnt a lot. From presenting the patient, we learnt that detailed history taking is very important and it can give clues which the patient has not mentioned directly.*Q202

  *The feedback session was of great benefit and educational value and did add value to the overall experience.*Q38

  *I was able to learn from my supervisor at the site during the feedback session as, theoretical knowledge from hearing about other patients whose cases were presented.*Q177

- Students benefitted by taking responsibility for their own learning

The only thing I learned was how to figure things out for myself as there was no one at the site to give me guidance.[Q42]

By stepping out of my comfort zone and experiencing new things for myself.[Q166]

- Using the knowledge, they have acquired already, and the experiences that they had, to accomplish tasks.

  I was able to draw from my previous L-CAS visits and theoretical knowledge when talking to my patient about hypertension.[Q177]

  I went back to my previous years notes to revise some of the material, especially the 3SAP that is a basis for a consultation with a patient.[Q175]

- Consciously thinking about the task and reflecting with peers.

  We had to think about the 3SAP the whole time we were speaking to our patient and we spoke in great detail after we spoke to outpatient so we got a good understanding of what we are doing.[Q194]

- Group discussions during and after the visits. We reviewed our goals and I realised that there's a lot that I still need to achieve.Q54

- Writing the report and reflecting on the day

  Writing up our reports helped me to reflect and understand better – putting everything together (big picture). For example the 3SAP – didn't make sense – although I asked the questions, until I wrote up the report.[I1]

- When students' own expectations for the day were met.

  When we enjoyed the visit, everybody is positive and willing to learn.[FG2]

  We spend an hour and a half at this clinic and although I do think the existence of these clinics for the community is a good investment, we as students benefit absolutely nothing from these visits. We learned nothing new.[Q181]

- Having the equipment bags available

  I would just like to add how helpful the medical bags were. With the help of these bags we were able to do a full examine and we managed to be quite thorough which is very important in medical practice and often overlooked. Also encourage people to use them and practice using the equipment because it is one of the only opportunities we have had so far to use and ENT set for example or even something as simple as a thermometer.[Q75]

- Learning a new language

  I want to challenge myself to learn as much of the indigenous languages as possible (Sepedi and Sesotho) because it really helps patients warm up to you and give you helpful information. *Q29*

- Having the portfolio run over all the years

  Put everything in one place so that you can see what you do in the end – the feeling of achievement. *I2*

- Students felt the need for guidance in terms of with what to expect and how to deal with challenges faced during a L-CAS visit.

  Maybe it would be helpful if we were given some sort of reference point as to what we should achieve during our visit. *Q73*

  The written-out format that you could just follow gave us confidence. *FG1*

  It will help if you prepare us better for the patient interactions – to know what to ask and how to ask it for example with simulations before the time. It is very scary to interact with a patient. *FG5*

- Support staff at the L-CAS visit sites that take responsibility for the students and their learning can be of great help.

  Having a doctor at the site who will orientate us and give us a mini tutorial is very good and necessary. *Q202*

  Emotional and spiritual support is necessary to be able to work through sessions like today. I really did not find today's session helpful at all, and emotionally I was very upset, and I know of a lot of people in my group *Q175*

  I didn't learn anything else as there was no one there to teach me or show my anything. *Q42*

  It would have been nice had someone taken the time to explain to us how prescriptions should be written and given to the pharmacist and how we should fill in referral forms …. I think it might partially also be our fault for not asking specifically for someone to teach us , but also the fact that no one at Daspoort seem too eager to find out what we wanted to know and were too busy doing their own duties. *Q73*

We were at Daspoort, but no doctor arrived, so we left at 10. Hope that we have a better learning opportunity in future.[Q31]

Challenges faced by students

From the data sources a list was compiled of all the different learning challenges that students encountered, with supportive quotes for each.

Students reported the following challenges:

- Language barrier.

  There was a language barrier where both parents were from Venda and the SIC conducting the consultation was Indian and didn't speak any other language. Fortunately, my classmate could speak a few works of Venda and spoke fluent Sepedi, where the father could speak Sepedi. The problem with this was that the main patients were the mother and baby. They come for the one-week check-up and as we were asking the questions the father answered without asking the mother. With the use of body language and also asking the father to interpret and using my own instincts on whether the message was conveyed across or not.[Q8]
- Difficulty in getting information.

  And he was very confused so getting the history was difficult. The fact that he didn't want to speak about medical things made our job more difficult.[Q194]
- The timing of activities

  The activities were scheduled in between our normal clinical rotation and theoretical blocks so it didn't get the attention it needed.[FG4]

  Very little dedicated time to focus just on L-CAS.[I1]

  Timing of L-CAS was usually at the end of rotations, just before a test, so nobody focused on the tasks.[I1]

  Visits few and far in between – would be better to work for a period of time.[I2]
- Fourth year is very busy and stressful

  We felt overwhelmed and stressed out by the other work and L-CAS was just an (what felt like then) unnecessary waste of our time.[FG3]

It is a difficult year academically. L-CAS doesn't count marks, so was regarded as a lot of work for little benefit.[I2]

Students are very stressed and focused on passing – not in the right mind for L-CAS.[I1]

- The focus of L-CAS is so different from other rotations

  fourth year focused on clinical work – felt like L-CAS focus only on the individual and the context – would be good to put it all together.[I2]

  What we learned was not important in ANY other rotation – even in Family Medicine most of the doctor's didn't apply the principles or do the 3SAP in their daily work.[I1]

- fourth years doesn't understand the necessity of L-CAS

  Experience dictates your mindset and students influence each other [I1]

  The Level of maturity of students – most people just wanted to get the reports done as soon as possible, with the least amount of effort and time. I had a lot to say and I used the report to do so.[I2]

- Students are not confident in their own abilities.

  Students are too immature, not confident.[FG2]

- Students don't feel empowered

  You feel that you cannot make a difference.[FG2]

  Feeling of being unwanted and out of place.[I1]

  Feeling that you cannot change anything for the patients – you can't make it better for them.[I2]

  And students felt unheard and unsupported when they complained about the safety – it made them negative.[I1]

  Group negativity – they were overwhelmed and didn't know what to do about it.[I2]

  When you feel like a doctor you want to learn.[I3]

- Logistical problems

  Logistical problems at the sites are a big problem. – some places didn't want us there.[FG1]

  Logistics – only getting instructions late with bad directions.[I3]

How did students address their challenges?

From the data sources a list was compiled of all the strategies that students employed to address the challenges they faced, with supportive quotes for each.

Students' reported the following strategies:

- When patients were not being available or willing to interact with students – students asked for another patient.

  The first challenge was that the patient we were assigned to was not available in his room and we were told that he usually roams around the premises so we must find him but we couldn't find him so we asked to be given another elderly patient to interview. Q204

- When students encountered communication difficulties – they changed their communication strategy.

  The patient we were interviewing could not hear properly so I overcame this challenge by speaking louder and avoiding the use of medical jargon. Q204

  I addressed the language barrier by working with a colleague who conducted the interview while I aided her and made notes. Q177

- Students prepared for the visits

  To address the task we were given we referred to notes that we had been given before approaching the patient so that we looked professional and were more confident in what we were doing. Q202

  I went home and read in my text book on how to take a proper history and which questions are important to ask. Q175

In the focus group discussion and the two interviews students mentioned that they have a much better understanding of the value of L-CAS and the activities of L-CAS now, as a final year student, than what they did in their fourth year.

"I only realise now how beneficial it was…" FG3

"……did not understand in fourth year, but now I understand why we had to do it." I2

Objective 2

The 2nd objective will be addressed in terms of evidence of students learning, as presented in the patient write-ups in the RRRs.

Students had to write up four patient cases during the course of the year. It is noted here that what the students presented might not be a true representation of the actual consultation with the patient, as only the written report was evaluated, no observations of student-patient encounters were done.

Descriptive Statistics

Out of the 269 students, only 193 (72% response rate) completed at least one patient case that could be evaluated. Students did not complete patient cases due to the fact the some of the visits were cancelled and some students didn't complete the full case possibly due to the amount of work entailed. Evidence of competence (4 on the scale) was observed in a number of students during at least one patient encounter, as tabulated next:

Table 6: Number of students providing evidence of competency during at least one of the patient encounters

Clinical competence	Number of students deemed competent who handed in at least one patient case, /193	Number of students from the larger group deemed competent, based on the evidence presented /269
• History taking	24 (12%)	8.92%
• Examination skills	13 (7%)	4.83%
• Clinical reasoning	15 (8%)	5.58%
• Sourcing evidence to make a diagnosis	15 (8%)	5.58%
• Special investigations	11 (6%)	4.09%
• Compliance in a patient with a chronic disease	21 (11%)	7.81%
• Control in a patient with a chronic disease	19 (10%)	7.06%
• Complications in a patient with a chronic disease	18 (9%)	6.69%
Individual assessment		
▪ Doctor-patient relationship	22 (11%)	8.81%
▪ Communication skills	24 (12%)	8.92%
▪ Patient's understanding of disease, value system and beliefs	32 (17%)	11.90%
▪ Cultural sensitivity	31(16%)	11.52%
▪ Language	28 (15%)	10.41%
Contextual assessment		
▪ Context of the patient	33 (17%)	12.27%
▪ Effect of the context of the patient on the disease and of the disease on the context of the patient.	25 (13%)	9.29%
Plan		
• Understanding of the disease and its management: ○ Include all the aspects of the 3SAP	28 (15%)	10.41%
	18 (9%)	6.69%
○ Pharmacotherapy ○ Non-pharmacological interventions	20 (10%)	7.44%
• Primary care / understanding of COPC ○ Prevention, health promotion and management of disabilities	20 (10%)	7.44%
○ Integration between different platforms of care	18 (9%)	6.69%

Cross-tabulation of competency level (non-competent: scores of 1, 2 or 3 compared with competent: score of 4) shows the percentage of students that actually attained competence across three patient encounters. A significant association between patient encounter and competency was observed in students who had reflected on both patient encounters (n=193) for all competencies, in that encounter three was consistently associated with higher competency percentages of students (Table 7). Frequency of perceived clinical competence (competency score >3) at encounter one and three were remarkably low for all competencies, with the exception of *Special investigations* (65.3% at encounter three), and *Control in a patient with a chronic disease* (65.8% at encounter three).

Table 7: Association between mastery of competency and patient encounter. (n=193)

Clinical competence	Mastery of competence at the first encounter	Mastery of competence by the third patient encounter	Chi square	P value
History taking	9 (4.7%)	14 (7.0%)	107.3	<0.001
Examination skills	5 (2.6%)	8 (4.1%)	97.7	<0.001
Clinical reasoning	6 (3.1%)	9 (4.7%)	126.6	<0.001
Sourcing evidence to make a diagnosis	6 (3.1%)	9 (4.7%)	126.6	<0.001
Special investigations	30 (15.5%)	126 (65.3%)	7.8	0.005
Control in a patient with a chronic disease	32 (16.6%)	127 (65.8%)	9.4	0.002
Complications in a patient with a chronic disease	5 (2.6%)	9 (4.1%)	86.2	<0.001
Doctor-patient relationship	6 (3.1%)	11(6.0%)	86.6	<0.001
Communication skills	7 (3.6%)	12 (6.2%)	94.6	<0.001
Patient's understanding of disease, value system and beliefs	6 (3.1%)	15 (7.8%)	45.7	<0.001

Clinical competence	Mastery of competence at the first encounter	Mastery of competence by the third patient encounter	Chi square	P value
Cultural sensitivity	8 (4.1%)	15 (7.8%)	76.8	<0.001
Language	7 (3.6%)	13 (6.7%)	86.2	<0.001
Context of the patient	7 (3.6%)	17 (8.8%)	64.3	<0.001
Effect of the context of the patient on the disease and of the disease on the context of the patient.	7 (3.6%)	14 (7.3%)	79.9	<0.001
Understanding of the disease and its management: Include all the aspects of the 3SAP	8 (4.1%)	17 (8.8%)	75.4	<0.001
Pharmacotherapy	5 (2.6%)	9 (4.7%)	86.2	<0.001
Non-pharmacological interventions	5 (2.6%)	11 (5.7%)	84.9	<0.001
Primary care / understanding of COPC	5 (2.6%)	12 (6.2%)	77.4	<0.001
Prevention, health promotion and management of disabilities Integration between different platforms of care	4 (2.1%)	10 (5.0%)	74.8	<0.001

Legend: the chi-square test was applied to assess the association between competency level at encounter 1 and encounter 3 (n= 193)

Competency across all clusters

Six competence clusters (CompCs) were identified as:

- Cluster 1: Clinical skills (CompC1): For this cluster we used five competencies namely: history taking / examination / clinical reasoning –

differential diagnosis / evidence to make a diagnosis / Special investigation. Highest possible score: 20

- Cluster 2: Follow up of a patient with a chronic disease (CompC2): For this cluster we used three competencies defined for the management of chronic patients: compliance / control / complications. Highest possible score: 12
- Cluster 3: Patient interaction skills (CompC3): For this cluster we used four competencies namely: doctor-patient relationship / communication skills / cultural issues / language. Highest possible score: 16
- Cluster 4: Contextual assessment skills (CompC4): For this cluster we used three competencies namely effect of context on the disease and the disease on the context of the patient / context / all aspects of 3SAP. Highest possible score: 12
- Cluster 5: Management plan (CompC5): For this cluster we used two competencies namely the pharmacological and non-pharmacological management. Highest possible score: 8
- Cluster 6: Primary care and COPC (CompC6): For this cluster we used three competencies namely COPC / prevention and promotion / integration of care. Highest possible score: 12

Table 8: Students' scores per competency per visit (n=193)

Individual Competencies and clusters	Visit 1		Visit 2		Visit 3		Visit 4	
	Mean/4	SD	Mean/4	SD	Mean/4	SD	Mean/4	SD
Cluster 1: Clinical assessment								
History taking	1.75	0.97	2.17	0.95	2.35	0.97	2.43	0.85
Examination	1.43	0.76	1.91	0.85	1.98	0.89	2.16	0.80
Clinical Reasoning	1.43	0.74	1.87	0.82	1.99	0.85	2.16	0.77
Sourcing evidence to make a diagnosis	1.42	0.74	1.87	0.80	1.98	0.85	2.10	0.77
Special investigations	1.4	0.69	1.9	0.76	1.9	0.77	2.1	0.79

Individual Competencies and clusters	Visit 1		Visit 2		Visit 3		Visit 4	
	Mean/4	SD	Mean/4	SD	Mean/4	SD	Mean/4	SD
Cumulative scores for Cluster 1 out of a possible score of 20	***7.45***	***3.60***	***9.69***	***3.86***	***10.20***	***3.97***	***10.93***	***3.76***
Cluster 2: Follow up of a patient with a chronic disease								
Compliance in a patient with a chronic disease	1.54	0.82	1.81	0.80	2.02	0.89	2.24	0.83
Control in a patient with a chronic disease	1.48	0.78	1.81	0.79	2.04	0.91	2.24	0.83
Complications in a patient with a chronic disease	1.47	0.77	1.81	0.81	2.01	0.91	2.24	0.83
Cumulative scores for cluster 2 out of a possible score of 12	***4.50***	***2.28***	***5.43***	***2.37***	***6.07***	***2.68***	***6.68***	***2.48***
Cluster 3: Individual assessment								
Doctor-patient relationship	1.55	0.87	1.91	0.93	2.20	0.99	2.29	0.86
Communication skills	1.54	0.88	1.92	0.94	2.23	0.99	2.32	0.86
Value system and beliefs of patient	1.72	0.96	2.10	0.97	2.22	0.99	2.29	0.93
Cultural sensitivity	1.54	0.89	2.06	0.99	2.28	0.89	2.36	0.87
Language	1.56	0.98	2.02	0.97	2.29	0.98	2.34	0.87
Cumulative scores for cluster 3 out of a possible score of 20	***6.68***	***2.39***	***7.22***	***3.10***	***8.59***	***3.30***	***9.30***	***3.30***
Cluster 4: Contextual assessment								
Context of the patient	1.70	0.94	2.23	1.01	2.33	1.00	2.38	0.91
Effect of the context of the patient on the disease and of the disease on the context of the patient.	1.70	0.94	1.98	1.64	2.12	0.95	2.15	0.86
Cumulative scores for cluster 4 out of a possible score of 8	***5.08***	***2.67***	***6.40***	***2.83***	***6.72***	***2.87***	***6.87***	***2.62***
Cluster 5: Management Plan								
Understanding of the disease and its management: ○ Include all the aspects of the 3SAP ○ Pharmacotherapy ○ Non-pharmacological interventions	1.66 1.45 1.51	0.95 0.76 0.76	2.07 1.82 1.90	0.96 0.77 0.81	2.17 2.01 2.14	0.97 0.91 0.95	2.20 2.13 2.21	0.92 0.82 0.81

Individual Competencies and clusters	Visit 1		Visit 2		Visit 3		Visit 4	
	Mean/4	SD	Mean/4	SD	Mean/4	SD	Mean/4	SD
Cumulative scores for cluster 5 out of a possible score of 12	***2.97***	***1.45***	***3.72***	***1.53***	***4.15***	***1.82***	***4.34***	***1.58***
Cluster 6: Primary care / understanding of COPC								
• Prevention, health promotion and management of disabilities • Integration between different platforms of care	1.50 1.4	0.75 0.70	1.98 1.8	0.85 0.74	2.17 1.9	0.96 0.89	2.23 2.1	0.81 0.75
Cumulative scores for cluster 6 out of a possible score of 8	***4.62***	***2.24***	***5.73***	***2.70***	***6.25***	***6.25***	***6.41***	***6.42***

Students achieved higher competency scores over time but overall performance was poor.

Change in competency scores across all clusters

The Kruskal-Wallis all-pairwise comparisons test was employed to perform comparisons within clusters, to demonstrate professional growth over encounters. The results are depicted in Table 9. For competency clusters 1, 2, 5, and 6, median competency scores for the clusters were significantly higher with all encounters compared with the first encounter, while encounter two three and four did not differ, and competency at encounter 2 and 4 also differed significantly.

For Cluster 3 competencies, professional growth was only evident between the first two and the last two patient Encounters, proficiency being similar at encounter 1 and 2, and similar at Encounter 3 and 4. For Cluster 4

competencies, professional growth was only evident between the first and all following patient encounters, proficiency being similar at encounter 2, 3 and 4.

Table 9. Change in competency scores across encounters within the clusters of related competencies.

Competency Cluster	Patient encounters			
	Encounter 1 Median (range) *Mean Ranks*	Encounter 2 Median (range) *Mean Ranks*	Encounter 3 Median (range) *Mean Ranks*	Encounter 4 Median (range) *Mean Ranks*
Cluster 1	5 (5-20)	10 (5-20)	10 (5-20)	11 (5-20)
Clinical skills	*291.47*	*427.21*	*456.23*	*504.84*
	291.47	*427.21*	*456.23*	*504.84*
Cluster 2	3(3-12)	6(3-12)	6(3-12)	6(3-12)
Follow up of a chronic patient	*307.79*	*402.50*	*454.78*	*517.31*
	307.79	*402.50*	*454.78*	*517.31*
Cluster 3	6 (4-16)	7(4-16)	8(4-16)	10(4-16)
Individual assessment	*304.16*	*330.44*	*425.09*	*476.77*
	304.16	*330.44*	*425.09*	*476.77*
Cluster 4	3(3-12)	6(3-12)	6(3-12)	6(3-12)
Contextual assessment	*320.62*	*431.24*	*456.04*	*470.13*
	320.62	*431.24*	*456.04*	*470.13*
Cluster 5	2(2-8)	4(2-8)	4(2-8)	4(2-8)
Management Plan	*300.86*	*414.72*	*464.48*	*500.90*
	300.86	*414.72*	*464.48*	*500.90*
Cluster 6	3(3-12)	6(3-12)	6(3-12)	6(3-12)
Primary care / understanding of COPC	*311.69*	*414.58*	*464.75*	*488.64*
	311.69	*414.58*	*464.75*	*488.64*

Results are reported as median (range), as well as *mean ranks*.

The linked cells (shaded) depict the competency cluster scores that are not significantly different from one another.

In the next chapter I will be looking at the results for Objective 3 and 4 namely the application of the data, obtained from the Questionnaires that students completed in the beginning and end of the year, to the Medical Education capability model. We will scrutinise the data from the questionnaire to understand students' perceptions about the key aspects of the Medical Education Capability Model namely: students' aspirations and their resources as well as their understanding of the conversion factors that influence their capability set.

Secondly, I will use the quantitative data obtained from the questionnaire to determine students' perceptions of goal attainment of their aspirations.

CHAPTER 5: RESULTS

STUDENTS PERCEPTIONS ABOUT ASPECTS OF THE MEDICAL EDUCATION CAPABILITY MODEL

Introduction

In this chapter Objectives 3 and 4 will be addressed, namely:

3. To determine students' perceptions about the key aspects of the Medical Education Capability Model namely: students' aspirations and their resources as well as their understanding of the conversion factors that influence their capability set.
4. To determine students' perceptions of goal attainment of their aspirations.

All fourth-year students had the opportunity to complete a questionnaire at the beginning of the year, and again at the end of the year, regarding the different aspects of this capability model. Each student worked individually, with a facilitator available, to explain the questions if they needed further clarification.

Objective 3

To determine students' perceptions about the key aspects of the Medical Education capability model namely: students' personal aspirations and their resources as well as their understanding of the conversion factors that influence their personal aspirations as demonstrated in Figure 1 (page 24).

Personal aspirations

Students reported that they found it very difficult to identify their own aspirations as they are so used to people telling them what to do. After clarification, explanation, discussion and encouragement from the researcher that administered the questionnaire 268 students identify aspirations for themselves. In Table 10 the top 20 aspirations students mentioned are listed and rated on a scale of 1 – 10 with 1 being the highest rating. The total number of aspirations reported is mentioned in the far-right column.

The aspiration mentioned most frequently in the first position is that of becoming a doctor (90/268). The aspiration that was mentioned most by all students (in any position) was to gain skills and knowledge in a range of fields and subjects (158 students), and secondly to get or remain healthy (154 students). Having a family and taking care of them, building relationships and getting married was listed as fifth (125), ninth (81) and tenth (67), respectively. Professional aspirations like becoming a doctor, specializing and becoming a doctor with specific good characteristics rated third (149), fourth (143) and sixth (115) respectively. The observed trend is that the professional aspirations were mentioned more in positions 1-4 and the personal aspirations were mentioned more later on.

Table 10: Students' aspirations in ranking order as reported

ASPIRATION	Number of students that rated each aspiration on the scale from 1(highest) – 10(lowest) as well as the total number:										
	1	2	3	4	5	6	7	8	9	10	TOTAL
To get more skills and knowledge (inside and out of the field of medicine)	1	15	13	17	22	29	27	10	17	7	158
Get or remain healthy (Including diet and exercise)	10	22	21	16	19	17	17	13	12	7	154
Becoming a Doctor	90	12	7	11	8	9	3	3	6	0	149
Specializing	21	43	20	16	13	9	6	6	6	3	143
Having a family and taking care of their family	0	12	18	22	15	18	8	17	8	7	125
Being a doctor with specific characteristics like being competent, compassionate, knowledgeable	33	25	15	9	7	2	7	9	5	3	115
To travel the world	3	7	13	16	22	11	11	9	2	5	99
Being an entrepreneur, starting a business, investing in property or cars	0	4	14	17	8	17	9	8	3	2	82
Better relationships (Spend more time and energy on relationships)	3	16	14	15	7	5	7	3	3	8	81
To get married	4	7	11	8	9	6	12	8	2	0	67
To develop and grow in all aspects of spirituality	4	5	9	7	8	8	4	5	4	6	60
Being a better student (Studying harder and more effectively)	2	3	9	4	5	13	6	7	2	5	56
To develop their personality and character	1	1	9	4	7	3	9	5	9	8	56
Pass fourth year	14	5	6	7	4	5	3	6	1	2	53
Being happy	7	6	7	6	5	4	1	7	4	1	48
Being financially independent	2	4	7	12	4	6	3	4	3	2	47
To help people financially and medically	6	6	7	1	1	8	6	4	1	2	42
To have an impact on people	1	5	5	9	0	2	6	4	4	3	39
To have confidence in themselves and their abilities	2	7	7	6	2	1	1	4	3	0	33
Being recognized or achieving awards	19	7	1	0	0	0	1	0	2	2	32

Students were also asked to name up to ten aspirations that they specifically have for L-CAS. This was done to understand whether students have the same expected outcomes with this activity, as we expected them to have. It would also help us to understand what students' expectations of the activity are, so that we could help them to derive learning needs from that. In Table 11 is a list of our objectives for L-CAS and the number of students that mentioned it as their aspiration for L-CAS, is given.

Table 11: Frequency of listing of L-CAS objectives as personal aspirations by students

Objective	(n)
Do a Consultation with any patient in any setting	21
Set a comprehensive and appropriate 3-stage assessment and plan.	65
Practice Communication skills and Interpersonal skills.	78
Practice Clinical examination and procedural skills	89
Meet and get to know the patient in his/her context and understand all the different aspects related to the patients' context	47
Get to know and understand the primary care sites and COPC with a specific focus on linked care.	18
Understand the function of the healthcare facilities within the communities.	13
Practice lifelong learning skills to acquire the necessary knowledge that will enable them to function in L-CAS	6
Practice IT skills	0
Practice Reflective skills	1
Learn a new language	12

From this table we can see that most students have a need for clinical examination and procedural skills training (89) and a need to practice

communication skills (78); only 65 students expressed a learning need regarding employment of the 3SAP and 21 for the consultation, respectively.

Conversion factors

Students were asked to list as many factors in each category(enabling factors and constraining factors) as they wanted to. The top 20 conversion factors that students identified in each of the two categories, are listed in the following section with the number of students that mentioned that factor:

Enabling factors

Enabling factors are those things that can help or enable a student to achieve his/her aspirations. The factors that students mentioned are listed in Table 12 in order of the highest to the lowest number of mentions.

Table 12: Frequency scores for enabling factors

Number of students (n=222)	Enabling factor
76 (34,2%)	Hard work each day
53 (23,9%)	Emotional support from family / loved ones
51 (23,0%)	Motivation
40 (18%)	Time management
33 (14,9%)	Access to resources
32 (14,4%)	Having more time
30 (13,5%)	To set achievable goals for myself
30 (13,5%)	To plan and be organised
26 (11,7%)	To have finances available
23 (10,4%)	To have colleagues and peer available
23 (10,4%)	Religion and being religious

Number of students (n=222)	Enabling factor
20 (9%)	Self confidence
20 (9%)	Dedication and commitment
20 (9%)	Experiential learning opportunities
20 (9%)	Focus
17 (7,7%)	Determination
15 (6,8%)	Discipline
13 (5,9%)	Positivity
13 (5,9%)	Relaxation and time for myself
11 (5,0%)	Having a mentor or guidance

Constraining factors

Constraining factors are those things that can hinder or constrain a student's achievement of personal aspirations. The constraining factors that students mentioned are listed in Table 13, starting from the factor that was mentioned the most.

Table 13: Frequency scores for constraining factors

Number of students (n=222)	Constraining factor
40 (18%)	Motivation, lack of
37 (16,7%)	Not enough time
34 (15,3%)	Anxiety or stress
33 (14,9%)	Financial challenges
33 (14,9%)	Laziness
26 (11,8%)	Lack of support
22 (9,9%)	Burnout

Number of students (n=222)	Constraining factor
22 (9,9%)	Personal challenges
21 (9,5%)	Academic pressure
18 (8,1%)	Loss of Confidence
18 (8,1%)	Distractions – social, physical, or emotional
18 (8,1%)	Negativity – personal and from others
18 (8,1%)	Not enough resources
17 (7,7%)	Procrastination
12 (5,4%)	Academic failure
12 (5,4%)	Illness – physical and mental
10 (4,5%)	Loss of interest
9 (4,1%)	Time wasting
8 (3,6%)	Bad personal circumstances
7 (3,2%)	Balance between work and play disturbed

The first factor they were asked to identify is their own **personal attributes**. The attributes students named, with the number of students that identified each factor, are listed next.

Table 14: Students' Personal Attributes (n=222)

Enabling factors (number of students that mentioned the attribute)	Constraining factors (number of students that mentioned the attribute)
• Determination and resilience (15) • Motivation and being inspired (31) • Focus on end goal (9) • Hard worker (19) • Confidence (2) • Intelligence (5)	• Lack of confidence (5) • Negative attitude and peer pressure (1) • Overthinking and stressing (7) • Social skills – being shy (3)

Enabling factors (number of students that mentioned the attribute)	Constraining factors (number of students that mentioned the attribute)
• Access to information (1) • Self-knowledge (2) • Faith and relationship with God (2) • Being able to learn from my mistakes (1) • Enjoyment of what you do (1) • Being social and extrovert (10) • Being happy (1) • Plan ahead (1) • Good leadership skills (2) • Being adaptable (2)	• Personality disorder / mental disorder (1) • Being Lazy (3) • Low self-esteem (3) • Taking too long to finish a project (4) • Fear of failure (3) • Bad time management (1)

The average significance (out of 4) and main themes identified from students' responses regarding the significance of enabling- and constraining conversion factors in their own lives are listed in Table 15, 268 students answered this question.

Table 15: Students' perceptions of the impact of different conversion factors on the achievement of their aspirations. (n=268)

Conversion factors named in the literature	Average of significance of conversion factor enabling students' aspirations /4	Average of significance of conversion factor constraining students' aspirations /4
Social structures	3.2	1.6
	• Students reported good access to resources at University and residence in terms of people, information and technology that are enabling for them.	

Conversion factors named in the literature	Average of significance of conversion factor enabling students' aspirations /4	Average of significance of conversion factor constraining students' aspirations /4
	• Some students reported that they feel overwhelmed with all the resources available at the University and little time to use it • Students reported that there were appropriate student support available • A reported limiting factor is the big groups of students in clinical setting	
Policy and programmes	2.6	1.7
	• Students experienced policies and programmes as providing guidance and structure • Students realised that policies and programmes help them to measure progress professionally and personally • Some students mentioned that time is limited in some programmes • Students felt that policies and programmes ensure their safety Students commented that policies and programmes provide opportunities	
Laws	2.5	1.6
	• Students reported that laws provide guidelines for conduct • Students realised that laws are meant to protect them • Some students felt that laws are not significant	
Cultural patterns	2.5	1.7
	• Students reported that cultural patterns help them to better understand people and form better relationships with patients • It was felt that cultural patterns bring a lot of different viewpoints and diversity	

Conversion factors named in the literature	Average of significance of conversion factor enabling students' aspirations /4	Average of significance of conversion factor constraining students' aspirations /4
	• Students reported that cultural patterns is not limiting • Some students felt that cultural patterns are not significant • Students reported that cultural patterns highlight language barriers	

Resources

Personal resources

The top 20 named are listed in Table 16:

Table 16: Personal resources identified by students with the number of students mentioning each resource (n=262)

Number of students	Personal resource mentioned
260 (99,2%)	Family
195 (74,4%)	The internet with programmes like google, Facebook, YouTube etc
195 (174,4%)	Friends
170 (64,9%)	Academic resources like the university, lecturers, class notes
165 (63,0%)	Computers, i-pads, laptops, electronics
148 (56,5%)	Religion, church
75 (28,7%)	Finances
67 (25,6%)	A car
66 (25,2%)	Books – non-academic
56 (21,4%)	Cell phone
46 (17,6%)	Intelligence, your ability to learn
44 (16,8%)	Library

Number of students	Personal resource mentioned
43 (16,4%)	Personal attributes and characteristics
39 (14,9%)	Gym
39 (14,9%)	Time
31 (11,9%)	Home
27 (10,3%)	Motivations
24 (9,2%)	Coaching, a mentor
22 (8,4%)	Previous education
20 (7,6%)	Fellow students

Table 17: Personal resources identified in the literature compared to students' responses regarding the significance of each resource

Personal resource	Number of students that responded	Average of significance of personal resource /4
Psychological	268	3.4
	Themes identified from students' qualitative remarks regarding the significance of psychological resources for them to achieve their aspirations. • If you are psychologically stable and have peace of mind you are able to deal with your studies better. • Students work long hours and are exposed to emotionally draining situations. • If you are psychologically stable you can deal better with the other life challenges you have to face on top of the academics. • How you see yourself or perceive yourself has a big impact on how you interact with other people. • To achieve your life goals you need to be mentally prepared and have the correct mindset.	

Personal resource	Number of students that responded	Average of significance of personal resource /4
	• Support is very important to help you deal with challenges. • Stress relieving activities like sport play a big role in your psychological wellbeing. • You can achieve, or better your psychological well being by building your faith, letting other people build into you, reading books, watching videos that will help you to understand yourself better.	
Spiritual	268	3.4
	Themes identified from students' qualitative remarks regarding the significance of spiritual resources for them to achieve their aspirations. • God governs behaviours and gives direction. • God gives hope and reason to work hard. • God provides stability in good and challenging times. • Spirituality helps in studies and personal life. • Values and ethics are more important than spirituality and God.	
Educational	268	3.4
	Themes identified from students' qualitative remarks regarding the significance of educational resources for them to achieve their aspirations. • It is the tool to success in life and will allow you to identify and achieve your aspirations • It is a lifelong learning process • You need resources to achieve education – electronics, the internet and WiFi, a school, teachers You have to see and use opportunities	
Financial	268	3.3

Personal resource	Number of students that responded	Average of significance of personal resource /4
	Themes identified from students' qualitative remarks regarding the significance of financial resources for them to achieve their aspirations. • Having money will make life comfortable. • It can be a huge obstacle in achieving your aspirations. • It gives you access to resources that can help you achieve your aspirations. • Parents and or family are a big source of financial support.	
Health	268	3.1
	Themes identified from students' qualitative remarks regarding the significance of health resources for them to achieve their aspirations. • You need a healthy body to function in full capacity. • Diet and exercise, good friends and minimal stress are part of being healthy. • Medical aid and access to healthcare is important to maintain health.	
Material Goods	268	2.8
	Themes identified from students' qualitative remarks regarding the significance of material goods for them to achieve their aspirations. • You need certain goods to achieve your aspirations / certain goods can make achieving your aspirations easier. • Overall it is not very important. • It doesn't bring happiness and good relationships.	
Access to info	268	2.9

Personal resource	Number of students that responded	Average of significance of personal resource /4
	Themes identified from students' qualitative remarks regarding the significance of access to information for them to achieve their aspirations. • It will provide me with the knowledge and skills that I need to achieve my aspirations. • You need technology and the internet to access information.	

Social resources

The top 20 named social resources are listed below in Table 18:

Table 18: Social Resources identified by students with the number of responses for each resource

Number of students(n=260)	Social resource mentioned.
238 (91,5%)	Family
229 (88,1%)	Friends
91 (35%)	Social media
79 (30,4%)	Fellow students
68 (26,2%)	Religion
53 (20,4%)	Academic resources like medical school
51 (19,7%)	Your background
36 (13,8%)	Your boyfriend or girlfriend
34 (13,1%)	Interactions with colleagues
31 (11,9%)	Going out; social interactions
23 (8,8%)	Compassion or humanitariasm

Number of students(n=260)	Social resource mentioned.
18 (6,9%)	Cell phone
18 (6,9%)	Internet
17 (6,5%)	Marriage
15 (5,8%)	Finances
13 (5%)	Culture
13 (5%)	Gender
13 (5%)	Support system
12 (4,6%)	Community involvement
11 (4,2%)	Your race

Table 19: Social Resources identified in the literature with students responses regarding their significance

Social resource	Number of students that responded	Average significance of significance of social resource /4
Cultural	268	2.7
	Themes identified from students' qualitative remarks regarding the significance of culture for them to achieve their aspirations. • It provides a sense of identity and belonging • Exposure to different cultures is necessary to teach students how to conduct themselves and react to different people • It builds character in a person • It doesn't have an influence on your aspirations, but influences how you achieve them • Culture is not important	
Networks	268	2.7

Social resource	Number of students that responded	Average significance of significance of social resource /4
	Themes identified from students' qualitative remarks regarding the significance of networks for them to achieve their aspirations. • Essential for realizing your aspirations • Good networks give you guidance and support • Use networks to increase knowledge, socialize and destress, get access to new opportunities • Social media very important platform	

Environmental resources

Table 20: Environmental Resources identified by students with the number of responses for each resource

Number of students (n=131)	Environmental resource mentioned.
115 (87,8%)	Home, accommodation
55 (42,0%)	Nature, your garden
49 (37,4%)	Water
47 (35,9%)	Libraries
43 (32,3%)	Car or no car
41 (31,3%)	Living close to University
41 (31,3%)	University
36 (27,5%)	Weather
34 (25,6%)	Internet
33 (25,2%)	Electricity
31 (23,7%)	Hospitals
31 (23,7%)	Residence
29 (29,8%)	Having a friendly and happy living environment

Number of students (n=131)	Environmental resource mentioned.
23 (17,6%)	Good food
21 (16%)	Family
19 (14,5%)	A healthy environment
19 (14,5%)	A quiet and motivating environment
19 (14,5%)	Friends
17 (13%)	Gym
16 (12,2%)	Your computer

Table 21: Environmental Resources identified in the Literature with the students' perceived significance of each resource

Environmental resource	Number of students that responded	Average of significance of environmental resource /4
Natural	267	2.9
	Themes identified from students' qualitative remarks regarding the significance of natural resources for them to achieve their aspirations. • It is not important • A good natural environment makes you happy and comfortable and able to function at your best, • A bad environment doesn't stop you from achieving your goals • Safety is important • Being close to campus is important as well as being close to resources • No natural disasters	
Geographical	267	2.6
	Themes identified from students' qualitative remarks regarding the significance of geographical resources for them to achieve their aspirations. • Easy access to library, hospitals and gym	

Environmental resource	Number of students that responded	Average of significance of environmental resource /4
	• Increased travel time increase stress • Not very significant	
Climate	267	2.2
	Themes identified from students' qualitative remarks regarding the significance of climate for them to achieve their aspirations. • No impact • Sun is very important for good mental state • It is easier to study when it is not to hot • No natural disasters	

Objective 4

Goal attainment

Pre-post goal attainment of aspirations

The pre-and post- scores for all ten aspirations reported by students (as a group) are tabled next. All comparisons were significant ($p < 0.001$) with higher ratings being observed with the end-of-the-year evaluation (Table 22).

Table 22: Mean scores for student aspirations beginning and end of the year

Self-reported Student aspirations				
	(n)	Beginning of the year- Mean (SD)	(n)	End of the year - Mean (SD)
First Aspiration	256	3.2 (1.2)	199	3.9 (1.2)
Second Aspiration	254	2.7 (1.3)	188	3.3 (1.5)
Third Aspiration	249	2.6 (1.4)	175	3.4 (1.5)

Self-reported Student aspirations				
	(n)	Beginning of the year- Mean (SD)	(n)	End of the year - Mean (SD)
Fourth Aspiration	223	2.5 (1.4)	174	3.4 (1.4)
Fifth Aspiration	194	2.5 (1.4)	172	3.3 (1.5)
Sixth Aspiration	157	2.7 (1.4)	165	3.4 (1.5)
Seventh Aspiration	115	2.4 (1.4)	143	3.3 (1.5)
Eight Aspiration	87	2.5 (1.4)	130	3.4 (1.5)
Ninth Aspiration	48	2.4 (1.3)	105	3.1 (1.4)
Tenth Aspiration	31	2.7 (1.6)	84	3.1 (1.4)

A significant ($p<0.001$) association between goal attainment at the beginning of the year and end of the year evaluations of the five most important aspirations (respective chi-square values 32.4, 51.3, 30.8, 23.5 and 20.3) was found. Of the 192 students who had rated their attainment of first aspiration at the beginning and end of the year, 139 had worked actively towards their goal attainment / had attained their goal (rating of 4-6), 49 of which at their final evaluation. For the second to the fifth aspiration the respective (n) of ratings, total percentage of goal attainment and goal attainment at the final assessment were: 179, 85, 41; 163, 82, 46; 146, 73, 43; and 127, 57, and 30 as shown in Table 23.

Table 23: Ratings for Aspirations two to five

Aspiration	N of ratings	Total percentage of goal attainment	Goal attainment at final assessment
2nd aspiration	179	85	41
3rd aspiration	163	82	46
fourth aspiration	146	73	43
5th aspiration	127	57	30

Summary of results for Chapter 5

Objective 3

From the students' responses to questions in the questionnaire pertaining to the Sandars and Hart model, we see that about a third of our students mentioned 'becoming a doctor', as their first aspiration. Overall, they mentioned both personal and professional aspirations. Professionally they wanted to specialize, become a doctor with specific characteristics and be recognized for their achievements. Personally, they valued relationships – getting married and having other relationships, as well as having a family, as aspirations.

The **conversion factors** are those things in your life that can help you or hinder you to achieve your aspirations. Students identified personal attributes like hard work each day, motivation, time management and to plan and organize as things that can help them. Psychological aspects like emotional support from friends and family, and relaxation time was also identified as being important in helping them to achieve their goals. Financial resources were mentioned as the fifth most common enabling factor and spiritual resources like faith and prayer as tenth. Educational resources identified to aid them in achieving aspirations included colleagues and peers, experiential learning opportunities and having a mentor or guide.

Personal attributes like lack of motivation, anxiety or stress, laziness, loss of confidence and negativity, were listed as factors that constrain them in achieving aspirations. Lack of time was mentioned second most commonly by students overall and financial challenges fourth most commonly. Psychological factors also seem to be significant in hindering achieving aspirations. Students mentioned factors like lack of support, burnout, personal challenges and

distractions. Academic failure and pressure were also mentioned as very common constraining factors.

Personal resources: Students identified friends and family, the Internet and academic resources like the University, technology for example a computer, and religion, as resources that they can use to achieve their aspirations. Students rated the personal resources named in the literature as significant (average rating more than three out of four) with the exception of material goods and access to information.

Social resources: Students identified friends and family as well as fellow students, social media and religion as the most important social resources that they can use to achieve their aspirations. . Most students rated the social resources named in the literature, as less significant (less than three out of four).

Environmental resources: Students identified their homes or accommodation, nature and water, the library and having a car or not as the most significant environmental resources that they can use to achieve their aspirations. The environmental resources mentioned in the literature were not seen as significant in achieving their aspirations.

Objective 4

When we look at **goal attainment** of the aspirations students set for themselves it is clear that as a group they worked towards achieving the aspiration(s) they set for themselves. A significant number of students achieved at least some part of the aspiration.

In the next chapter we will be looking at the results for Objective 5 namely the application of the data, obtained from the Questionnaires that students completed

in the beginning and end of the year, to the Family Medicine Capability Approach to Learning. We will scrutinize the data from the questionnaire to understand students' perceptions about the key aspects of the DoFMUP capability model, namely: relationships, identity and knowledge, disruptions and their reaction to the disruption.

CHAPTER 6: RESULTS

STUDENTS PERCEPTIONS ON ASPECTS OF THE DEPARTMENT OF FAMILY MEDICINE'S CAPABILITY APPROACH TO LEARNING

Introduction

In this chapter objective 5 will be addressed, namely:

5. To determine the students' perceptions about the key aspects of the capability approach to learning, namely: relationships, identity and knowledge, disruptions and their reaction to the disruption.

Objective 5

Students' Identity

Students' perceptions about their own identity

Students self-evaluation regarding their identity in terms of their confidence, their motivation, their values and beliefs, as well as explanations provided for their answers, are listed in Table 24, for the beginning and end of the year.

Table 24: Students' perceptions about their own Identity

	Beginning of the year	End of the year
Confidence	• Most students felt confident • Some felt more confident than before in their ability to interact with other people • Some students felt that they have some confidence although not much • Some students felt their confidence is not desirable • A student mentioned that although he might come across as being very confident he is quite insecure and uncertain • Some mentioned that they are confident in who they are but not in their abilities as students or doctors	• Students felt more confident than the previous year and even in the beginning of the year. • Students felt that they acquired some knowledge during the year • Many students reported growing confidence or good confidence • A lot of students mentioned that their confidence is based on their faith in God • A few students said they still lack confidence
Motivation	• Students are mostly motivated to learn more • Some mentioned that they need to work on their motivation because they are tired	• A student mentioned that s/he lost the motivation to study medicine • Another student mentioned their motivation to study has decreased dramatically this year • Some students reported that they struggle to find motivation • Mostly students are highly motivated • Some students mentioned a lack in motivation • One student mentioned feeling depressed and discouraged most of the time but was still working towards her goals
Values and beliefs	• Most students believed that they have strong beliefs and spiritual values. • Traditional and spiritual values were mentioned as being important • Many students believed that anything is possible • A few students mentioned that they have no spiritual belief • Some felt that they have a greater understanding of their own values and beliefs	• Most students mentioned that they were Christians or believed in God • One student mentioned that he beliefs in good and evil and right and wrong • One student mentioned that he tries to live each day with integrity and respect and gratitude • A number of students state their belief in their ability to complete the degree • Students background determined their beliefs • A few students mentioned that this year changed their beliefs • A few students mentioned their lack of beliefs and/or value system(s) • One student mentioned his great moral values but that he lacks the ability to implement them • Another believed in science and truth and tried to respect those around him

	Beginning of the year	End of the year
Explanations Provided by students	• Personality plays a role in confidence – being an introvert or shy makes it difficult to step out of your comfort zone • One student mentioned that medicine is boosting her confidence • One student mentioned that being in a very strict house made it difficult for him to think for himself. • The fear of failure is a strong motivator • Family, friends and future are good motivators • Most students mentioned that God and their relationship with Him is their motivator • Others reported their passion to help others as their motivator • A number of students believed that hard work pays of and that they have to keep their body and mind stimulated	• One student mentioned that his motivation is to prove to society that he is everything that they think he doesn't have the ability to be • Many students mentioned that the development of their character changed their beliefs and values • Challenges and experiences this year allowed students to shape themselves. • Socializing with people who have depth and are completely different to the student can help students to learn from others •

Students' perceptions about their own confidence, motivation, self-efficiency and belief in the 3SAP

Students self-evaluation regarding their confidence in setting a 3SAP, their motivation to set a 3SAP, their self-efficacy in setting a 3SAP and their belief in the 3SAP are listed in Table 25 for the beginning and end of the year. Table 26 list the qualitative responses from students explaining their self-evaluation.

Table 25: Students' Confidence, motivation, self-efficiency and belief in the 3SAP

	Students self-evaluation Mean score (out of 10) Beginning of the year	Students self-evaluation Mean score (out of 10) End of the year
Confidence in setting a 3SAP	5.8	7.5
Motivation to set a 3SAP	5.4	7.1
Self–efficiency in setting a 3SAP	7.3	7.6
Belief in your ability to set a 3SAP	6.3	7.5

Table 26: Students' qualitative responses on their confidence, motivation, self-efficiency and belief in the 3SAP

	Beginning of the year	End of the year
Confidence in setting a 3SAP	• Students felt shy and afraid to show their flaws • Students felt they do have the basic knowledge, but not enough. They are worried that they will miss something • They felt they need more theoretical knowledge • They felt they need more practice • Some thought they have a good idea of how to do it as they have engaged with many patients	• Some didn't get to implement it • Others felt that they are still learning to apply it – they need more experience and practice • Some reported that they cannot remember all the components, they don't have enough knowledge yet • A few still needed to work on their confidence and learn to trust their own judgement • Most students have had fair interactions and experience with different

	Beginning of the year	End of the year
		patients
Motivation to set a 3SAP	• A few reported that they are not confident about the system and therefore they will refrain from using it • Some reported that they will only do it because it is required • For some it didn't always seem practical • Students reported that they want to gain confidence and flow in clinical practice • Some said they are motivated • Some reported that they are highly motivated because they know that with a good history one will never mismanage a patient	• A few students said they always hope someone else does it • Some felt there are other ways that are more efficient • Some were motivated, but still feel that the actual medication is more effective • Some are very motivated – because they feel it easily guides you to what needs to be done • Some realized the importance because they have seen the importance of it • Some reported that it is effective
Self–efficiency in setting a 3SAP	• Students reported that they still need practice • Some said they cannot do it by themselves because they are not confident about their judgement • Some said that they have always worked with other students up to now – they are unsure of how well they would do on their own	• A few stated that they haven't done it yet • A few students said they still need assistance • Some reported fear of going wrong around their colleagues • Some stated that it takes to much time to do it • Some said that they have the necessary resources,

	Beginning of the year	End of the year
	• Some said they believe in themselves –that they will be able to do it	but still need to learn to put it all into practice • Some said that they are able to do it on their own because of practice seeing patients on a regular basis and applying it • Some said that it is an easy model to follow • Many students reported that they are capable of doing it on their own
Belief in the value of the 3SAP	• Students said they can't do it without help • Some said that they find it easier for some patients than others • A few reported that they will try their best – although they don't know everything yet, but they will do their best • Some said they believe in themselves	• Some reported that they are not ready to use it • Some said they do believe, but they still have doubts • Some said they were taught how and did it before • Most said they did it on numerous occasions • Some felt they have mastered it

Overall, students' confidence, motivation, self-efficacy and belief in the 3SAP improved over the year. From the qualitative responses it is clear that practising the skills had a big impact on these factors.

Students' Knowledge

Students' perceptions about the kind of knowledge they have

Beginning of the year:

Students recognised that they have knowledge in more areas than just medical – and most students regard their general life-knowledge to be good. They felt that they were able to handle people from different backgrounds and different personalities. Students see themselves as street smart. Most students regarded their academic knowledge as that of the average third year student.

End of the year:

Students reported that their knowledge level has increased to that of the average fourth year medical student. They felt smart about life and life's challenges and in general their knowledge about their surroundings increased. They have a better understanding of themselves in terms of their own strengths and weaknesses and they are learning to think outside of the box. Many students mentioned that they are learning to keep a balance in all areas of their life – relationships, finances, spiritual and talents.

Students' perception about the level of their knowledge

Beginning of the year:

Most students perceived their level of knowledge to be relatively good and felt confident in the knowledge that they have at that time but there are still a large number of students who felt that they do not have enough knowledge yet, or reported that their knowledge is still full of gaps.

End of the year:

Students felt that they are gaining knowledge; they realised they know more than last year. They recognised that they know more than they thought they knew. Some even felt that they now have all the knowledge they need. There are a few students that concluded that they are academically below average.

Students' perceptions about how they have or should acquire knowledge

Beginning of the year:

Some students mentioned that they have the theoretical knowledge but need understanding. Some suggested reading as a remedy but mostly students reported that they need experience to improve knowledge and understanding. A few students reported their recall of facts to be poor; mostly because they learned in a hurry in the past. Students recognised that they needed to change their attitude towards learning, as they were not focused. A number of students also mentioned that when they rely on God they could do everything.

End of the year:

Development of themselves as a tool to develop their academic knowledge was mentioned. Some students use academic aids like videos or tutorials but mostly they mentioned that they have to exploit learning opportunities in the practical settings. A few students commented that they find it much easier to study the material they enjoy and to learn from mentors that inspire them with their passion.

Students' perceptions in terms of the impact of the knowledge on them

Beginning of the year:

Students mentioned that having adequate knowledge would enable them to

make good decisions that will affect their future. One student also mentioned that she loved to speak about her knowledge when she learned something new.

End of the year:

Quite a few students mentioned that they felt empowered and happy when they were able to answer a medical question with confidence and realised that adequate knowledge will make them better doctors. The knowledge that they have acquired this year also gave them the confidence that what they don't know they can learn. On the other hand, many students commented on the constant feeling of not being good enough or not having enough knowledge compared to their peers especially when the senior doctors constantly tell them that they do not know enough. It robs them of their confidence when they realise how many gaps in their knowledge still exist. Students recognised that their biggest challenge is the application of their knowledge in the practical setting.

Students' perceptions in terms of how they acquired the knowledge

Beginning of the year:

A few students mentioned that they used their considerable intelligence to acquire knowledge or to study hard every day and others mentioned observing practical experiences like the consultation. Students mentioned their life experience as a huge factor in their learning and when they have the opportunity to put what they have learned into practice. Some students mentioned that they learn best under pressure.

End of the year:

Students realised that their deeper understanding of medicine helped to build personal knowledge and academic knowledge and most students mentioned that they absorbed knowledge in practical work this year.

Students' Relationships

Beginning of the year:

- Good relationships provide support and build character. Students reported that they invest in good positive relationships because it keeps them motivated and help them to know themselves and other people as well as the world around them better. Relationships can also build personality.
- Students find it easier to form relationships with like-minded people, for example students with similar interests and a good understanding of the situation and stressors. They can easily ask for help from one another when they need it.
- Some students feel that they work better alone and limit their relationships to their colleagues that can assist them when they need help for example in the clinical setting, where it is then easy to work together. Some students also like small crowds more than a big group of people.
- Students realise that they have to resolve strained relationships for example manage conflict by talking it through and working the challenge out. They realise that because they don't have enough time it is difficult to care for loved ones and easy to lose contact with people because they have to prioritize their time. One student mentioned that he often substituted his strained relationship with his family with relationships with patients.
- Students mentioned the importance of diversity in relationships. Respect plays a big role in forming new relationships.
- Students reported that the most important relationship they have is with themselves and they must not neglect themselves.

End of the year:

- Relationships changed during the year. Socially, many students acquired new friends and grew apart from old friends. Professionally they focused

on relationships that have their best interest at heart. Most students reported that their family bonds grew stronger.

- Professional relationships are important. In many cases they are the only relationships the students have because colleagues are also their friends. If a student feels that he does not need many relationships he will focus on the professional relationships because he can get help from them if he needs it. Professional relationships can be draining because just as you can get help from your peers, your peers look to you for help and support. Lecturers have the ability to inspire and motivate students or break their confidence. Many students reported that they struggle to form social relationships outside of university life because their professional relationships tend to be their social relationships as well.
- Personal relationships bring fulfillment. Most students reported that they have good and strong personal relationships because it develops their personality and they find fulfillment in these relationships. The challenge is that it can also cause conflict because it does take a lot of time and energy to invest in these relationships and maintain them. Students reported that it taught them to be adaptable and more tolerant.

Overall, students mentioned their family and friends as the most important and supportive relationships. They regarded these relationships as very important because they found support and motivation from them. Students who mentioned strained relationships early in the year mostly reported at the end of the year that they worked on their relationships and it improved. A number of students reported that their friends are also their work colleagues and their relationships changed over the year in terms of valuing the relationships that added benefit and ending the relationships that were negative.

Students' perceptions about the impact of relationships on their learning of the 3SAP

Social networks

Students identified the following groups as their social networks:

- Fellow students of the previous years
- Classmates
- Family
- Friends
- The internet – WhatsApp, Google drive and Facebook
- Lecturers
- Patients
- The community the student grew up in
- Church community

The perceived impact of social networks on students' learning:

- Students always have someone close by to ask if they need academic assistance or struggle with understanding. Students are also proud of being available if one of their friends needs their assistance.
- The different groups usually have students that are able to speak a few languages, which helps with patient communication.
- The different beliefs and background of students' group members help them to understand and recognize the different beliefs and backgrounds of the patients, so that they can make better assessments and make better management plans.
- The different social groups help students to see how different people deal with problems.
- The rotation group members encourage and remind each other to apply

the 3SAP.

- Students learn from the example of others – by observing their behavior.
- Multidisciplinary networks help students to know where to refer to and to help them to know what can be done for a patient.
- By speaking to different people, students practice to speak to patients.
- Social networks support, inspire and motivate students. It also builds confidence and facilitates learning. It also helps to de-stress so that students can focus more on their academic work.
- The feeling of belonging to a group is important in building professionalism and makes students feel good.
- There are also a group of students that have not used their social networks or found no benefit in their social networks, for their learning.

Colleagues

The perceived impact of colleague-student relationships on students' learning:

- Conflict with colleagues makes it very difficult in a group. It breaks trust and hinders learning.
- Learn from senior colleagues' experience and guidance. Students observe their senior peers and ask questions to help them understand.
- Colleagues help with information and direction. If they are unsure as to what is expected or what to do, their colleagues can help. Having colleagues that enable an environment conducive to learning benefit all because they share opinions and views and can then come up with the best solution. Colleagues also push each other's boundaries and challenge each other to do better. Students also found it easier to ask questions, rather than to a facilitator.
- Interactions with colleagues give them a broader view on life and better understanding of different backgrounds and culture groups.

- It builds confidence when their colleagues ask them for help or agree with your opinion or diagnosis.
- Colleagues assist with transport. Students also feel safer to move in groups.

Patients

The perceived impact of patient-student relationships on students' learning:

- Patient interactions taught students the difference between their backgrounds and cultures and beliefs. Students realised that patients had different levels of knowledge and understanding and social circumstances.
- Students seemed to realise the importance of knowing and understanding the patients' identity and context so that they can set an appropriate 3SAP.
- Spending time with patients made students more tolerant towards people in general, who may not think like them and may not accept their beliefs and values.
- Students could practise communication skills.
- Students were inspired by patients and were reminded of why they studied medicine in the first place. This motivates students to continue and do better. It was good for students to see how patients enjoyed their presence and appreciated their care for them.
- Patient interactions build student confidence.

Teachers

The perceived impact of teacher-student relationships on students' learning:

- Teachers provided structure as to what needs to be learned and the basic information about the topic so that students had a baseline knowledge.

- Teachers emphasise the other important competencies that students need as well, for example communication skills.
- Students often do not have much interaction with teachers except for in lectures or in hospital. Even if the sessions are interactive only a few students get to interact with the teachers.
- Teachers often lack in providing good examples in the workplace. They do not "practice what they preach" and this is very confusing to students.
- Teachers have a lot of experience and knowledge on how to navigate the healthcare system and can provide a lot of support in this regard.
- Teachers provide feedback so that students can correct mistakes.
- When teachers are inspiring and good role models they motivate students.

Disruptions

The perceived challenges that students identified with supporting quotes

- Utilisation of time in the primary care setting due to administrative issues like communication breakdown, or miscommunication about the time that the activities start, or a lot of time wasted on dividing students into groups; and also because of planned academic activities from other blocks. The maps provided to students are not clear and students often got lost which also wasted a lot of time. *"…we didn't experience as much as we could have because we had little time at the site…."*$_{Q25}$
- Students' perceptions about patients were challenged. Many students were unfamiliar with realities in an informal settlement and never thought about the real context of sex workers in Pretoria. Students visited sex workers on the street and described their reaction as being shocked and ashamed when they realised that their perceptions about the women were wrong and they realised how badly these women are being treated.

Students also mentioned how their perceptions changed about people from foreign countries that live in South Africa.

*"… because this experience was so out of our comfort zones….but I realise now how many stereotypes that exist … are not necessarily true…."*Q25

- Struggling with clinical skills, like drawing blood, made students feel bad because they didn't succeed and the patient experienced pain. *"We did not manage to draw the blood and the patients experienced pain."*Q10
- The language barrier is still regarded as one of the biggest challenges when interacting with patients, but students report that because of the academic pressure from other rotations it is not possible to spend time to learn a new language. *"…the language barrier is still the biggest challenge of all……there is not much free time to facilitate my own learning of other SA languages…."*Q28
- Not having a doctor at the site to ask questions and get guidance from made students feel very uncertain and insecure. Students felt that nobody told them what to do and therefore they were immobilized and could not learn anything. *" we stood around for a long time waiting to be told what to do…"*Q21
- The location of the patients' houses in the community was a problem to some students. Students had to walk far and carry the heavy equipment bag. In some cases they also felt unsafe. *"It is a very long walk to the house that was allocated to us, especially since we had to carry the heavy bags…"*Q42 *: It was a nice interactive session… but the safety concerns meant that my group couldn't benefit from all its intended benefits."*Q33
- The number of students in a house when they visited a patient made it difficult to build relationship with the patient. In some cases, there were students from different disciplines in the same house as well as medical students from different years. *"it was a madhouse. Most of the rooms were*

full and we couldn't sit in and observe…."[Q67]

- Conflict with the community healthcare workers was a huge constraining factor for the students. Students became irritated with waiting for the CHWs and when they addressed the issue in a way that the CHWs felt was disrespectful the relationship was broken down. *"she took massive offense to this and told us that we were not welcome."*[Q58]
- Students are being exposed to intimate details about the patient's life and sometimes felt unable or not qualified to deal with the information. To some the responsibility that the information carried seemed too much. *" …it is amazing but challenging being allowed to hear about intimate moments of another person's life."*[Q21] *"….as we don't do much to help them…"*[Q256]
- The interview process itself was challenging to most students, as they do not have a lot of experience talking to patients. They have to apply previously acquired skills that they are still not confident about. There is no privacy to build trust between student and patient. *"…initially we used closed ended questions that didn't allow our patient to provide us with all the information…."*[Q38] *"… the informal approach for example sitting under a tree to make a child feel more comfortable.."*[Q162]
- Realising their own learning need was a challenge to some students. They had to work in a team and be part of the team for that team to function properly. *"I was challenged by my own lack of realizing the importance of the multidisciplinary approach and thinking that I can do everything on my own….and to really focus to remain teachable. It is challenging to work with a lot of different personality types,…"*[Q161]

Reviewing options

Creating the need for learning is not enough. The student needs to take action

as a result of this learning need and that requires motivation. This motivation depends on the student's sense of the value of that action. If a student is only motivated from an outside source, like a learning objective in a course, that does not have meaning or value to him, he will not engage with the learning process, but when the perceived learning need speaks to his internal value system it will be much easier for the student to move into action. Students' perceived motivation was discussed earlier in this chapter.

The action that a student then takes depends on cognitive and metacognitive skills. The student needs to understand his own understanding of his knowledge and abilities as well as his thinking about the process of acquiring new skills and knowledge. His review options can be facilitated through reading and reflection, reviewing and reacting.

Students' self-reported action(s)

Very few students reported on the action that they took to address their learning need or challenge

Review

- One student mentioned that he bought the Essential Drugs List and the South African Standard Treatment Guidelines to carry with him and have at hand to use in the practical setting.
- One student realised that he was not proficient in the interviewing process and found information and guidelines on how to make a patient feel comfortable so that the patient can provide all the necessary information
- Another group read up while they were busy with the interview and adapted their questioning technique as they were talking to the patient.

Reflect

- One student reported that, as a result of his original experience with sex workers and the process of thinking about it in his report he is now more understanding and patient with the street workers.
- One group of students made a habit of it to meet after a visit and reflect on their experiences in order to make sense of their experiences and allow all to benefit from one another.
- One student described how a discussion after the patient encounter made him realise that he still needs more knowledge on the subject and that inspired him to go and read up about the topic.
- Another student also described how self-reflection and discussions with the group members, the facilitator and the patient, helped her to understand that all people can have different opinions.

Read up or asked for help

- A student that struggled to take blood from a patient reported that he got a senior nurse to come and assist him. Another student used his phone and a translating dictionary to help him with the language barrier.
- One group of students decided to join the occupational therapy students and ask them about their work when they did not have a patient allocated to them. Reading the documents provided before a visit is of great help to some students as they can then prepare before the visit.

Students reviewed, reflected and read up to act on challenges they faced. Some students reported change of behaviour as a result of their reactions to the challenge.

Summary of results for Chapter 6

Objective 5

If we evaluate the students perceptions regarding the capability approach to learning from the DoFMUP model we see that in terms of their identity, most students felt more confident and motivated with stronger beliefs and values at the end of the year. There are a few students that reported an increase in confidence but decrease in motivation and that is disconcerting. Some of the students rooted their beliefs and values in presumably the Christian God and their relationship with God, which grew over the year.

Students' confidence in the 3SAP, their motivation to use the 3SAP, their belief in the 3SAP and their self-efficiency in using the model have also increased over the course of the year. Students reported that practicing the model clinically made them feel more comfortable with the patient as well, but most students still felt they need more practice.

Students mostly felt they had adequate knowledge around a broad range of subjects and their knowledge generally increased over the course of the year. Their self-knowledge also increased, although most realised that they have theoretical knowledge and still need the understanding and practical application. Students mentioned the satisfaction of realizing their knowledge has increased and the breaking down of their confidence when they realise that they are below average or standard and are constantly being told that they don't know enough.

Overall, students mentioned their family and friends as the most important and supportive relationships. They regarded these relationships as very important because they found support and motivation from them. Students who mentioned

strained relationships early in the year mostly reported at the end of the year that they worked on their relationships and it improved by the end of the year. A number of students reported that their friends are also their work colleagues and their relationships changed over the year in terms of valuing the relationships that added benefit and ending the relationships that were negative.

Students used their social networks, teacher, patients and colleagues mostly for support in the academic environment, on many levels.
Logistical issues seem to be a big challenge for students in terms of organizing and communication for each visit, the location of the patient house, safety and the number of students in the house. Furthermore, they mentioned personal issues like not having confidence in their own abilities, not knowing the language of the patient, the feeling of not being able to make a difference for the patient and their own perceptions about patients and their context, as challenges. Lastly students' lack of clinical skills and experience of the interview process itself was mentioned as challenges.

Very few students translated the challenge they faced into a learning need, but those that did act on the learning need reviewed, reflected and read up. Some students reported changed behaviour as a result of their reactions to the challenge.

In the next chapter I will discuss the findings reported in previous chapters regarding the appropriateness and significance of the two capability models as facilitators of personal and professional growth in the medical curriculum. In addition, I aim to corroborate the evidence and conclusions I have derived with findings of similar studies.

CHAPTER 7: DISCUSSION

Introduction

In this chapter I will be looking at the results from the data reported in Chapters 4, 5 and 6 to answer the objectives of the study. I will triangulate and integrate the data from all the data sources and identify the main findings.

This study was carried out to understand the learning activities and opportunities of L-CAS better, as well as the perceptions of the students, so that we can better plan and curriculate L-CAS in the future, to have a bigger impact on our students' development and preparation to function professionally. Personally, I also appreciate the opportunity to better understand why students often experience L-CAS negatively and struggle to learn from the experiences offered.

To answer the objectives of the study I will:

- reflect on the learning and learning opportunities as a result of the L-CAS activities, from the students' perspectives
- look at the evidence of learning from the patient case study evaluations
- apply the data to both the models to understand the learning process better

It is important to remind ourselves about our definition of capability for this study:

"In the context of L-CAS, and this study, capability is defined as the process of progressive growth and development of the students, through the learning opportunities and activities of L-CAS, that enable them to make meaning of complex situations that they are facing in the primary care settings of the

Tshwane District, and be able to use this new meaning and growth to inform their future decisions about patient management. This will be measured by the increased ability of the student to effectively use the consultation competencies in order to develop a 3SAP for each patient."

L-CAS as a learning activity

The education pedagogy of L-CAS is mostly built on the DoFMUP capability model[6] with a big focus on self-directed learning[15,22,31], reflection[17,23,38,56] and peer learning[54,55]. Students go out in groups with a CHW. The experience is designed to trigger the learning process, as described in the model. The one big advantage of the programme is the longitudinal design[47,48] wherein students return to the same site and get the opportunity to build relationships with the team members.

What did students learn?

Longitudinal programmes are known to provide students with learning opportunities that they sometimes don't find in their normal curriculated activities. Longitudinal programmes are designed to provide students with the opportunity to form a relationship with a patient and be part of the whole spectrum of care of that patient – from early diagnosis up to rehabilitation at his home.[54] We know that longitudinal placements enhance students' understanding of patient-centred care and the importance of the context of the patient, namely the life perspective, family dynamics and social dimensions of a person's life.[47,48]

L-CAS was designed to expose students to primary care and COPC as well as the integrated care of patients. In Canada, a study showed that adult learners are

motivated when they can implement their new knowledge and skills immediately, in real-life situations.[48] The residents and community partners reported an increase of awareness about community resources and better links between the health care system and community resources.[48,55,56] This was also illustrated by the students in L-CAS that reported that they learned the importance of listening to a patient, the function and intricacies of the healthcare system, understanding the context of the patient and a better understanding of primary healthcare and COPC.

The Harvard Medical School-Cambridge Integrated Clerkship was designed to focus on the teaching of foundational consultation skills like communication skills, professionalism, cultural competence, physical examination and epidemiology, which are not always prioritized as a result of the pressure of clinical care.[49] L-CAS students reported that their clinical knowledge improved and they can apply the 3SAP better. Students also reported that they better understand the importance of listening to patients and that they communicate better with patients through the experience of patient interaction.

The main themes that emerged from the data sets in terms of students' reported learning are that: students learned the importance of listening to patients, they improved numerous communication and clinical skills by interacting with patients, they improved their clinical knowledge, they better understood the context of the patient, their self-knowledge increased, their knowledge and understanding of the healthcare system improved, their understanding and knowledge of Primary care increased, their knowledge and understanding of COPC improved, and their understanding of the application and use of the 3SAP improved.
In summary, our students reported that they learned and practised:

- the importance of listening to patients
- communication skills

- clinical skills
- clinical knowledge
- knowledge about themselves

Students also reported that they gained understanding in:

- the context of the patient
- the healthcare system
- Primary care
- COPC
- the application and use of the 3SAP

How did students learn?

L-CAS students reported that they learned by participation in all the settings, by using the information they already have, by revising material from previous years and visits, receiving feedback from peers and a facilitator and consciously thinking about the task and reflecting with peers. Peer observation and working with senior students or observing a doctor were also mentioned as learning methods. An Australian study also identified the importance of peers to achieve the meta-learning goals of critical reflection and learning from experience. They found that action-learning experiences enhance students' abilities to reflect critically, to learn how to learn (broader adaptive capabilities) and to build towards socialization and offer students a realistic preview of future professional roles.[15, 55]

L-CAS students reported that guidance in terms of how to deal with challenges, overall support at the site, facilitated learning, having equipment bags available, the experience of interacting with patients and a relaxed atmosphere, as enabling factors for their learning. It was reported in the literature that, for a placement to

be beneficial, there needs to be adequate support for students, staff and administrative staff, as well as a continuity of experience. Students should feel that they have enough experience and resources and that they are able to take responsibility for their own learning while they learn through problem solving and experience.[43]

In summary our students reported that they learned through the following enabling factors:

- participation in all the settings
- using the information, they have acquired already, revising material from previous years and visits
- presenting the patient to a facilitator that gave feedback
- conscious thinking about the task and reflecting with peers
- working with senior students
- observing their peers
- observing a doctor consult with a patient
- taking responsibility for their own learning
- group discussions during and after the visits
- writing the report and reflecting on the day
- being in the context of a patient that aided them to understand the patient
- guidance with what to expect and how to deal with challenges
- support staff at the sites
- when their own expectations for the day were met
- having the equipment bags available
- learning a new language

What challenges did our students face?

The Australian study further found that a longitudinal placement offers some of

the same challenges as our students identified, namely that what the students experience is often the endpoint of their encounter rather than being the beginning point of systematically learning from the experience. Students are often not allowed to practise in responsible roles that require real time decisions with consequences, due to safety and ethical considerations. As a result, the learning experience is often more vicarious than experiential and logistical considerations often severely limit experiential opportunities.[15] Additionally our students mentioned the language barrier, difficulty in getting the information from a patient; the stress of the rest of the academic responsibilities, as well as the lack of confidence in themselves and the feeling of not being able to help, as challenges.

In summary our students reported that the challenges they faced were:

- the language barrier
- difficulty in getting information
- the timing of activities in-between their other academic work
- the fact that fourth year is very busy and stressful
- the focus of L-CAS that is so different to other rotations
- the fact that fourth years doesn't understand the necessity of L-CAS
- the fact that they are not confident in their own abilities
- the fact that they don't feel empowered
- the logistical problems
- the lack of time in the primary care setting
- when their own perceptions about patients were challenged
- when they struggled with clinical skills, like drawing blood
- not having a doctor at the site to ask questions and get guidance from
- location of the patient houses in the community
- the number of students in a house when they visit a patient
- when there was conflict with the community healthcare workers

- not realizing their own learning need
- working in a team and be part of the team for that team to function properly

L-CAS students addressed challenges by asking for help, by changing their communication strategy and by preparing for the visit.

We can thus see that L-CAS did offer learning opportunities to students; students do think that they learned and developed professionally, but they also faced many challenges. It seems that there is not enough support for students at the sites; students are not adequately prepared for the challenges that they face at the sites; students do not have confidence in their own abilities and the academic pressure from the rest of the fourth year overshadows the importance of L-CAS activities. It seems that the L-CAS activity, for many of the students, did not trigger learning, but rather a response of negativity and feelings of inadequacy or irritation.

Evidence of Learning

The purpose of the data interrogation and statistical analysis was to:

- further support and understand the qualitative data by quantifying mastery of individual competencies in the group of students as a whole
- ascertaining the frequency (%) of students that had achieved competence in at least one of the patient encounters for each of the competencies
- assessing the association between patient encounter and level of mastery of a given competence
- evaluating changes observed in learning or achievement of mastery in clusters of related skills across patient encounters employing the Kruskal-Wallis all-pairwise comparisons test

In terms of objective evidence of what students learned regarding the specific competencies used in the consultation we can see that only a small number of students out of the whole class achieved competence in at least one of the patient encounters. It must be noted here that some of the competencies are clinical skills and are therefore difficult to report on in notes. Students was not observed while they performed the skills, but rather only reflected on their own competencies. It may also be that students lack motivation because their own aspirations differ from our expectations. This could influence the way in which they answered the questions and completed the RRRs. It can also explain why so many didn't translate challenges into learning needs.

Students scored highest in cultural sensitivity and context of the patient. This might be because so much focus is put on the patient in his/her context and the importance of their culture. It might also be that students focused more on special investigations and control in chronic diseases in some of their other fourth year rotation work and could apply that knowledge here.

If performance Levels 1, 2 and 3 are grouped together as not competent (0) and take Level 4 as competent and considering only the students that completed the patient case reports, the number of students that achieved competency is still very low (range between 5 and 10% except for two competencies namely special investigations and control in a patient with a chronic disease).

Even if the competencies are grouped together, it is still evident that students didn't perform well, although there is a slight increase in average scores from patient encounter one to three. This signifies professional growth demonstrated at encounter 4 that was most significant compared with the first patient encounter but was also evident compared with skills demonstrated at encounter 2.

It is thus clear from the evidence that students provided in their patient cases, that although they perceived that they had learned, the objective evidence did not reflect mastery of the competencies. Students struggled not only with the 3SAP but also the other consultation competencies.

Application of the Two Models to students learning

Model 1: The medical education capability model according to Sandars and Hart

This model hinges on the notion of students' own choice and identification of their aspirations that lead to capability sets, that will enable them to put the growth into action and reach achieved functionings. Some of their choices, in terms of aspirations, depend on their internal value system and beliefs and other aspirations depend on external factors, for example their culture, collective value systems and norms. Teachers play a big role in facilitating opportunity for making appropriate decisions in terms of moving aspirations to capability sets.[9]

From the results, we saw that students found it very difficult to identify their own aspirations. The one aspiration most students had for themselves was to grow and learn – to acquire new knowledge or a new skill. It is also interesting to note that the aspirations that students had for L-CAS does not correlate with our objectives for them during this activity. Students wanted to practise examination- and clinical skills as well as communication- and interpersonal skills, while only 65 out of the 269 students wanted to practice the 3SAP and only one student aspired to practise reflection. It seems that students do have the need for new knowledge and learning, but the content of that new knowledge and learning might not be the same as what we set for them as objectives in the course.

Students were asked to identify their aspirations but they were not challenged to reflect on them and refine them to a capability set while taking into consideration their resources and conversion factors. This might have helped students in attaining their aspirations. In some way, goal attainment did take place for most students as most students moved towards attaining their aspiration(s) over the course of the year.

The resources that L-CAS students mentioned as most important in terms of personal and social resources, were family and friends, the Internet, social media and electronic devices, religion and finances. This correlated with the named personal resources in literature but most of our students did not regard the social resource of culture, also named in the literature, as significant. Environmental resources are very similar to resources mentioned in the literature.[6]

Unfortunately there was not much evidence of students using their resources to deal with the challenges they faced.

In summary the personal resources students regarded as most important are:

- family
- the internet with programmes like Google, Facebook, YouTube etc.
- friends
- academic resources like the university, lecturers, class notes
- computers, i-pads, laptops, electronics
- religion and religious practices
- finance

The enabling and constraining factors named by students are tabulated:

Table 27: Summary of enabling and constraining factors

Enabling factors	Constraining factors
• Determination and resilience • Motivation and being inspired • Focus on end goal • Hard worker • Confidence • Intelligence • Access to information • Self-knowledge • Religion • Being able to learn from my mistakes	• Lack of confidence • Negative attitude and peer pressure • Overthinking and stressing • Social skills – being shy • Personality disorder / mental disorder • Being lazy • Low self-esteem • Taking too long to finish a project • Fear of failure

Most of the learning strategies that L-CAS students mentioned depended on other people for example: group discussions, observing and working with peers and senior students, or feedback from a peer / facilitator. These findings support the mentioned resources that students found significant and also triangulate with the learning strategies students mentioned in their reflective reports.

Conversion factors are those factors in one's life that can enable you or hinder you to achieve your aspirations.[9] Most students named hard work each day as the most common enabling factor. Other factors that could support / enable the attainment of their aspirations were emotional support from their family, time and available resources. Constraining factors that were mentioned include lack of motivation, too much stress and anxiety, lack of time and resource constraints. When L-CAS students reflected on their learning they mentioned guidance with what to expect and how to deal with challenges on the site, support staff at the sites, having someone to assist and facilitate learning at the site, taking own initiative, feeling happy and relaxed, having the equipment bags available and

interaction with patients, as the factors that enabled their learning. It is clear that students regard support at the learning site as the most important enabling factor. This also aids in their feeling of being relaxed and happy. Taking own initiative and learning a new language was also mentioned. Having students' expectations met for the day was also regarded as important and this links up with identifying your own aspirations and capability set for the activity, so that you can move into action.

L-CAS students reported the language barrier, difficulty in getting information from patients, the timing of the activities, lack of time and a lot of stress as a results of other fourth year activities, the focus of L-CAS being so different to other rotations, not seeing the relevance or importance of L-CAS and lack of confidence, not feeling empowered as well as logistical problems as the challenges that they faced. Even though language learning was identified as an enabling factor and the language barrier as a constraining factor, only 12 students out of 269 identified language learning as an aspiration. The perceived importance of the activity in between all the other fourth year activities that count more for their marks and have different outcomes and focus, take a lot of students' time and causing a lot of anxiety, seems to be a central factor as well.

Students highlighted the role of the teacher as a facilitator of opportunities for them to make choices that are appropriate for themselves and others. is They commented on the following enabling factors of their learning: guidance with what to expect and how to deal with challenges; importance of support staff at the sites; and having someone to assist them and facilitate learning at the site.

We can thus see that our students' aspirations were very different to what we set out for them to do and achieve. The following conversion factors made it difficult for students to achieve their aspirations:

- no facilitator at the site
- the language barrier
- the focus of L-CAS that was so different from their other rotations
- the fact that L-CAS is not credit bearing

It is also interesting to note that students didn't use their identified resources or conversion factors in the learning process consciously.

Model 2: The Capability approach to Learning

The DoFMUP model describes the process of learning where each student, when challenged, uses a review process to act on a learning need that was created and through this process grows and moves towards becoming mature. Motivation plays an important role in the reaction to the learning need created by the disruption.

This model focuses on the students being aware of who they are (knowledge, identity and relationship) and to consciously think about the learning process. They need to make sense of experiences through self-reflection and reflection with others, in order to put that new learning into action for future decisions and behaviour.

When L-CAS students were asked to reflect on their own identity, most regarded themselves as being confident and with growing confidence over the course of the year. There were a few that did not have confidence in themselves or in their abilities as students or doctors. Most students were very motivated, but even at the beginning of the year some mentioned that they had to work on their motivation because they were tired, which was echoed by more students at the end of the year. Spirituality and values were of utmost importance to most

students with a strong focus on religion. It seems also that more students believed in their own ability to finish the course by the end of the year. Many students commented on the fact that challenges and problems they faced during the year helped them to develop their values and belief system as well as their character and personality.

It is interesting to note that if we compare each student's responses from the beginning to the end of the year, most students felt more confident and motivated with stronger beliefs and values at the end of the year. There are a few students who reported an increase in confidence but a decrease in motivation, which is disconcerting. Most of the students rooted their beliefs and values in God and their relationship with God, which grew over the year.

When asked about their confidence, motivation, self-efficiency and belief in the 3SAP, L-CAS students' ratings for themselves increased over the course of the year mostly because they started using the 3SAP and could see the benefit to themselves and the patients.

L-CAS students realised that they have some knowledge but most felt that their knowledge is still inadequate although it improved much during the year. The importance of the ability to apply the knowledge practically to a patient was mentioned. Many students also commented on their growing confidence when they could answer a medical question and the negative effect of feeling that you do not know enough.

When asked about their relationships it was clear that most L-CAS students regard relationships as very important and valuable. Good relationships provided them with support and built their character, although they found it easier to build relationships with people that are like-minded. The time constraint was

challenging for most students as they had to prioritize what and who they are going to spend their time on and with. Students realised that their relationships changed a lot during the year and that their professional relationships became more important.

Relationships impacted profoundly on their learning of the 3SAP, especially through their sharing on social networks and interaction with colleagues. Teachers and patients played a less important role although they could still add to the learning process significantly.

Generally, students did not regard the L-CAS visits as a disruptor nor did most of them identify learning needs from the visits. Logistical issues seem to be a big challenge for students in terms of organising and communication for each visit, the location of the patient house, safety and the number of students in the house. Furthermore, they mentioned personal issues like not having confidence in their own abilities, not knowing the language of the patient, the feeling of not being able to make a difference for the patient and their own perceptions about patients and their context, as challenges. Lastly students' lack of clinical skills and experience of the interview process itself was mentioned as challenges.

Very few students translated the challenge they faced into a learning need. This could be because students have not developed 2nd and 3rd loop learning, or just because they lacked the motivation and confidence to address problems they encountered. It might also be because they haven't identified or linked their available resources and conversion factors to the challenges they faced and therefore felt un-equipped to deal with the challenge.

The students who did identify learning needs and acted on it reviewed, reflected and read up or asked for help to learn. They found reflection and talking to

someone or a group of people about the problem particularly useful.

We can thus see that students had a good idea of their identity, knowledge and relationships which all changed over the course of the year. Very few students could identity disruptions and even fewer could translate the disruption into a learning need. Students identified their peers as a very important source of learning and reflection but very few used this resource to achieve learning needs.

This study had some limitation that could influence the data. Due to factors like strikes, safety issues, etc some students could not attend all activities and therefore couldn't complete patient records for those visits. There were incomplete data sets for a number of students and some of the questionnaires and RRRs were not filled in completely. The length of the questionnaire and RRR could have played a role in why students did not complete them in full. The knowledge generated in this study might not be generalised to the other training institutions and other groups of students. Subjectivity of the researcher and participants can influence the data. This was minimised by discussing the data and understanding of the data with the current L-CAS facilitator and triangulating the various data sources. It is important to realize that the patient cases are only written reports on what happened in real life and cannot reflect the practical skills students performed. The RRRs are students' reflections of their behaviour and skills and were used as the evidence presented by the student regarding their learning.

The quantitative methods used were adequate to evaluate and better understand student perceptions about their own learning. Data were triangulated between the RRRs, the questionnaire, the focus group and interviews. Data saturation were reached and measures in place to ensure validity of the data include member checking, triangulation,

Trustworthiness of data was obtained through the following strategies like[64] understanding the population, conveying the data analysis process, reconstructing data collection memories and being open to change and comparing themes with the current L-CAS facilitator as well as incorporating member checks into the data analysis

In summary

From the results we can see that L-CAS did offered opportunities to learn, and students did perceive themselves to have learned and practised, although they faced many challenges, which they mostly didn't know how to address or overcome. According to the evidence students actually did not learn much nor did they become more capable during the course of the year, as we would have expected.

The two capability models help us to explain and understand the facts. The first model helps us in terms of understanding the students' motivation and reasons for actions. Their aspirations were very different from our aspirations for them, and although they identified their resources and conversion factors at the beginning of the year, students didn't consciously use those factors to address their learning needs and challenges.

The second model helps us in terms of understanding the process of developing and learning. Students generally had a good idea about themselves, even at the beginning of the year, but didn't feel empowered or felt that they have the support or resources, to change a disruption, in this case the L-CAS activity, into a learning need or to address a problem.

We can thus see that students struggled with academic service learning when they felt unsupported and uncertain.[1,16] They didn't take responsibility for their

own learning[14,15] by identifying learning needs[8] and addressing them, or used their available resources to address the challenges and learning needs. Reflection[16,17] with peers, colleagues and self, was mentioned as a way of learning during and after the activities, with a need for feedback. Students often learned most from their peers and colleagues through observation, participation or reflection. L-CAS offered students the experience (e.g. an encounter with a patient), and the opportunity to reflect on the experience through the written tasks, but lacked in supporting students to reflect on the experience with feedback, helping them to form their own concepts and generalisations of that experience that could be applied in a new situation (on a new patient) with confidence and motivation.[6,9,56]

In the next chapter I propose an integrated model, derived from both the capability models, to support the learning in L-CAS. This new model can address the identified challenges, and build on the identified strengths, for example the availability of resources as well as peer observation and reflection that already happened This new model builds further on the theoretical underpinning of capability,[6,9,39,46] self-directed learning,[14,15] academic service learning,[1,16] reflection[16,17] and feedback. [18]

CHAPTER 8: CONCLUSIONS

Introduction

In this chapter I draw conclusions and propose a novel model with suggestions for L-CAS learning, specifically as a result of the data and the application to the two capability models.

A novel complementary model – incorporating both the models

From the application of the data to the two models it is clear that both the models can help us in understanding the learning process of L-CAS students, as well as how we can adapt the learning environment to optimise learning opportunities for students.

Both capability models highlighted strengths and weaknesses in the current L-CAS learning activities.

- The following conclusions were drawn by applying the data to the Medical Education Model for capability:
    - The students' aspirations differed greatly from defined objectives for L-CAS. Identifying their own aspirations and aligning them with the objectives we set for L-CAS could be one of the strongest motivators for students to act on the identified learning need. The value of L-CAS should therefore be made clear to students, so that they will realise the advantages of participating in the activities.
    - Students did not utilise their available resources, enabling factors or conversion factors to address L-CAS challenges or support their

learning. It could help students to achieve their capability sets and achieved functionings when they consciously use the resources, enabling factors and conversion factors at their disposal. We should thus help students to identify their aspirations, resources, enabling factors and conversion factors. Students should also identify and recognise the constraining factors so that they can plan and be prepared to deal with challenges.

- The following conclusions were drawn by applying the data to the DoFMUP Capability model:
    - Very few students could translate the disruption they experienced into a learning need
    - Even fewer students were able to identify challenges or disruptions
    - Even fewer students saw the L-CAS activity itself as a disruption or opportunity to learn
    - It seems that when something challenges them, students easily feel demotivated or see it as an opportunity to abandon the learning activity

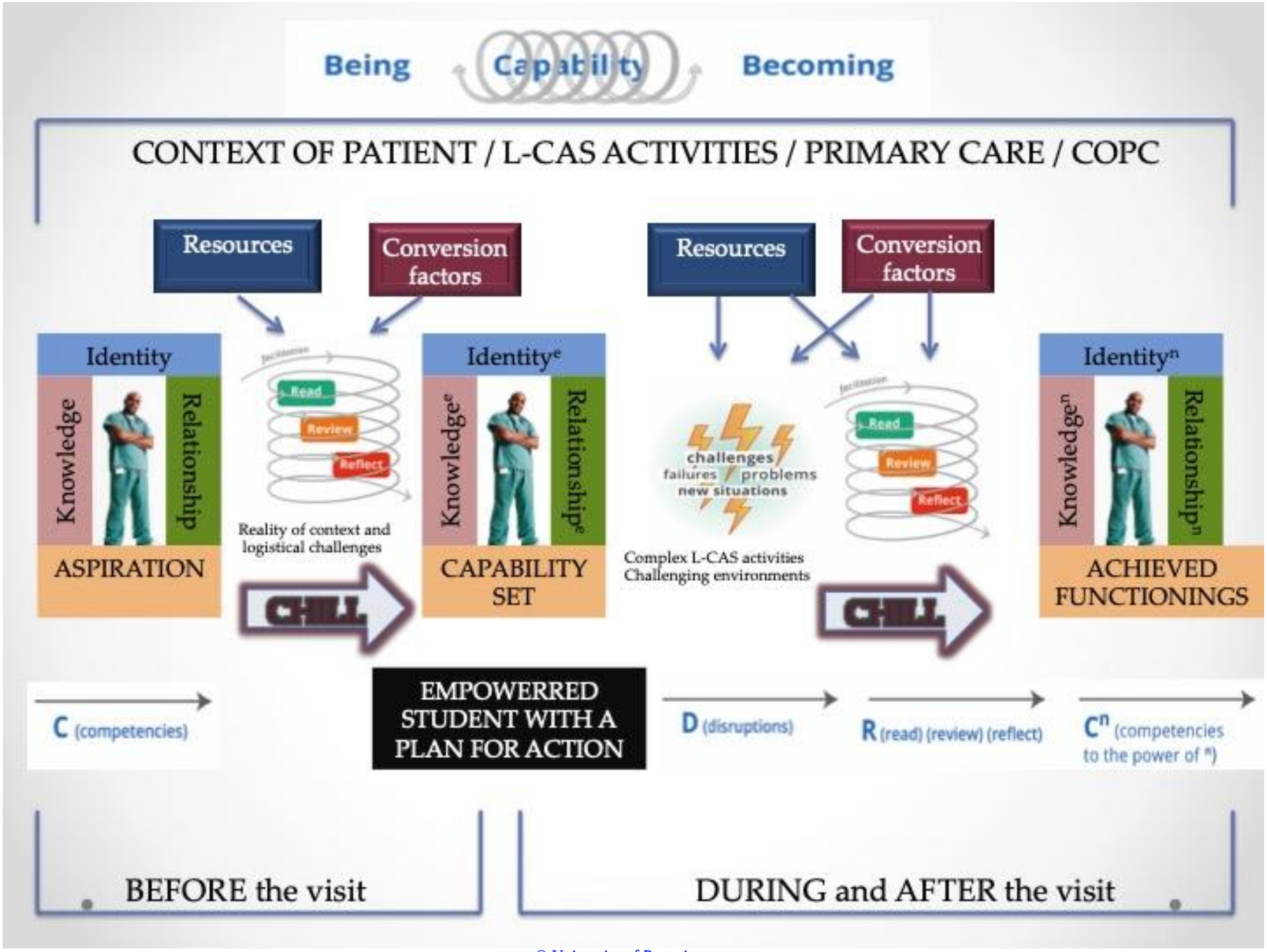
    We need to enable and facilitate students to identity possible challenges beforehand and identify ways to deal with those challenges. We also need to empower them to identify challenges during the activity and convert that into a learning need(s) and most importantly, to act on that learning need, through a facilitated process.

To address the identified challenges, we need to relook at the curriculum of L-CAS in terms of timing of activity and credits allocated in the SoM, so that the focus of the activity and the other rotations are better aligned. We also need to address the way in which we prepare students for the activities and support them

while they are at the sites. Furthermore, employment of the comprehensive 3SAP in patient consultations should be implemented across disciplines to assure appropriate patient management.

The following new model is proposed to support student learning in L-CAS:

February 2021



BEFORE THE VISIT

1. Curriculum Planning of L-CAS sessions

It should be considered to group the bulk of the L-CAS visits together in one or two longer, dedicated timeslots in the beginning and at the end of each of the semesters, so that students can focus on this activity without interference from other academic stressors. By the end of the year students feel more equipped to consult with patients because they have more knowledge and skills, better relationships and more confidence, motivation, belief and self-efficiency and a better understanding of the importance of the interaction with patients. It is proposed that the bulk of the time is concentrated at the end of the year. When students are then sent out to visit patients in these complex situations (like at a patient's home) they will be better prepared and less uncertain as well as more motivated.

When L-CAS is taken out of the regular rotations it could also get its own credits, so that students could understand the importance of the activity.

2. Preparation of, and support for students BEFORE the L-CAS activities

It is proposed that students identify a learning need(s) even before they go out on the activities, individually and/or as a group and also identify their identity, resources and knowledge, as well as their conversion factors that can play a role in the activity. Students should then formulate a plan as to how they are going to address that specific learning need individually as well as in a group and deal with any identified challenges.

Teachers should facilitate a session for students to identify, at the beginning of the L-CAS curriculum and activity, their own aspirations for L-CAS as well as for themselves. When students identify their own aspirations and goals in terms of their personal, professional and educational life, they have a goal to

work towards and can identify a way to achieve it. It would then also be possible to clearly state, define and discuss the outcomes of L-CAS so that students are explicit about their own aspirations for L-CAS (which can be personal, professional or educational) and also know what is expected from them in terms of L-CAS objectives and make an effort to align their own objectives closer to ours.

During these facilitated session(s) students should get the opportunity to identify their own identity, relationships and knowledge, resources and the conversion factors that are part of their life and can help or restrain them in achieving their aspirations. When students identify these factors beforehand, they know explicitly where they are in terms of having the opportunities and resources to transform their aspirations into a capability set. They will then be better prepared for each of the L-CAS activities. Students are being sent to challenging environments with diverse populations and complex situations. They can identify individually and collectively as a group, what the resources are that they have at their disposal, what the possible challenges could be and how they can address and manage the challenges and constraining factors. In this way they are enabled to translate every challenge into a learning need and act on that learning need in order to form new identity, knowledge or relationships.

Being prepared will address many of the challenges students identified, such as the fact that fourth year students do not appreciate the necessity of L-CAS, and do not feel confident regarding their own abilities. Students also need to understand the fact that the focus of L-CAS is very different from the other busy and stressful fourth year rotations. During this facilitated reflective session it would also be important to prepare students for the realities of what they may encounter on each visit and what would be expected of them. In particular, they need to be informed about the skills, knowledge and professional values they may need to manage the realities of the logistical difficulties and the diverse contexts they may encounter. We can then send out empowered students with a clear goal and strategy to achieve that goal.

DURING AND AFTER THE VISIT

1. Support DURING and AFTER the L-CAS activity

L-CAS is a curriculated opportunity for students to learn outside the hospital and lecture hall. Students should be able to learn from everything they do during the L-CAS visits, in all of the different domains identified in the Lancet document.[36] Students should regard everything that happens as an opportunity to learn and keep on learning.

When students arrive at the learning site they should have a mindset of:

"CHILL" - Changing cHallenges into Learning Loops

Each CHILL consists of:

- **C – (Challenge)** What was my DISRUPTION / CHALLENGE?

- **H – (How)** What did I realise about:
  - ✓ Myself? – Identity / Knowledge / Relationships / Resources / Conversion factors
  - ✓ My patient? – Clinical / Individual / Contextual
  - ✓ The Healthcare system?

- **I – (Identify)** What learning need did I identify for myself and for us as a group?

- **L – (Learn)** How can / did I address this learning need today and how will I address it in the future?

- **L – (Let it go…)** How can I teach my new competency to my peers or my team?

Students' learning loops will then be their learning portfolio that runs from year one to year six. The L-CAS learning of students should be taken forward in Block 16, their fifth year Family Medicine activity, and ultimately in their final

year and form the basis of their portfolios in each of these senior activities. Students will be accountable for their own and their peers' learning.

Voice notes, a reflective journal, creative writing, and drawings should all be adequate as evidence of activities in the learning portfolio.

Each learning loop is a continuous loop of learning that will never end (capability approach to learning).

Facilitators at the learning sites are of utmost importance. The reality is that there are not enough people at the sites or from the university so that there can be a dedicated person at every site for every student visit. One of the available resources for the students is the VULA application, which students have on their phones. The VULA application is a mobile phone application that students can register on, in order to have access to senior doctors in real time. They can use the application as a referral method or as a mode of getting in contact with a consultant. CHWs are also available at most of the sites and if students are a regular part of each of the WBOTs it would be easier for them to fit in and feel part of the team. The one constant support factor at the site is the students themselves. Students mentioned peer discussions and observation and peer learning as a big part of how they learned and I propose that we use the interaction of the group of students more.

It would be greatly beneficial if students could keep each other responsible for addressing their original learning need, identifying a new learning need while they are busy with the activity and then addressing that new learning need. This could be done through facilitated peer reflection sessions (CHILL sessions) as part of the visit, occasionally with a facilitator at the site or at the DoFMUP. For the peer learning activity to be structured there needs to be a group leader with a clear guide as to what is expected of him/her and each of the students.

Students' learning portfolio then consists of the learning needs and how they

addressed each of these needs, taking into consideration the resources at their disposal as well as the enabling and restraining factors they have to deal with.

Concluding thoughts

My thesis statement was: “The Longitudinal Community Attachment Programme for Students (L-CAS) is a curriculated activity that provides learning opportunities for the acquisition of competencies required for the performance of a successful consultation and growth as a medical professional.” Students should develop capability to consult a patient as demonstrated by their setting of an appropriate and comprehensive case assessment and the development of a management plan that takes the complexities inherent to different primary care settings into account.” This has been proved partly correct as there are ample opportunities for students to learn, but students are not adequately prepared to make use of learning opportunities that arise.

CHAPTER 9: RECOMMENDATIONS

Introduction

In this chapter I propose further actions and recommendations as next steps toward the implementation of the new model.

The three main stakeholders that need to participate in the implementation of this model are the practitioners, the faculty managers and the researchers. I will suggest further steps for each of these groups of people.

Further steps for the researcher:

- Continued research to include other facilitators of learning for the L-CAS program. These will include the CHWs, WBOT team leaders, staff at the community sites, support personal from the DoFMUP and the L-CAS facilitator. The purpose of the research will be to understand their perceptions about students learning in the L-CAS environment in order to triangulate the data with our current understanding.
- Continued research to validate the data analysis of the focus group interviews to support and enrich the current conclusions
- Further work on the data gathered in this study will include coding of RRRs and independent coding of RRRs questionnaires by an independent researcher. This would serve as additional validation of qualitative data, and to ensure the reliability of the marks awarded by the researcher for the case reports.
- The study findings will be presented to our own faculty and nationally at the medical education conference and Family Medicine meetings, as well as internationally at medical education conferences as well as conferences pertaining to Family Medicine and Primary Health Care.

- The findings should be discussed with the current L-CAS facilitators and support personnel in order to get buy-in and support for the new proposed model. A process of change management should commence.

Further steps for the L-CAS facilitators:

- It would be important for the L-CAS facilitators, organisers and support personnel from the DoFMUP to deeply emerge themselves with the content of this thesis. They should get a deep understanding of the results as well as the new proposed model to be able to implement it.
- L-CAS as a program should be re-designed, taking into account the findings of the study. It could be done during a day long workshop or workshops. Focus should be particularly on the support of students before, during and after the activities following the "CHILL" acronym.
- The teaching material for L-CAS for example the study guides should be changed to include the new model and process.
- Role players in the L-CAS program for example the WBOT team leaders, the CHWs, the facilitators at the community sites and community members should be informed to also support the new model presented.

Further steps for the faculty leaders:

- The leaders of the faculty of Healthcare Sciences at the University of Pretoria, SoM should firstly be informed about the new model (with application possibilities in other courses as well)
- The continued curriculum review process is the perfect opportunity to implement changes in the timing of L-CAS visits as mentioned by students.
- It would be important to separate L-CAS from other blocks and for L-CAS to become credit bearing.

- Consideration should be given to the importance of the L-CAS objectives for the whole SoM and curriculum in order to create more awareness of the importance of primary care and COPC as well as the ability to set a 3SAP for a patient, which are universal competencies the every student should master.

The concluding recommendation arising from the study is that this novel integrated capability model, for supported student learning in L-CAS should be implemented and tested as part of the Faculty's ongoing curriculum review and renewal process. If this model is proven to be implementable and effective it could be usefully implemented in other community based settings and programmes, nationally and internationally.

> *"We saw that if you listen to them they will tell you even more than you wanted to know but at the end you understand much more about them….You should treat your patient with a disease and not the disease of a pt."* *Q183*

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APPENDIX 1: LIST OF ACRONYMS

3SA	Three-stage assessment
3SAP	Comprehensive three-stage assessment and management plan
CHWs	Community Health Workers
COPC	Community Oriented Primary Care
DoFMUP	Department of Family Medicine of the University of Pretoria
L-CAS	Longitudinal Community Attachment program for Students
NHI	National Health Insurance
NDOH	National Department of Health
PHC	Primary Health Care
RRR	Rotation Reflective Reports
SANDF	South African National Defense Force
SoM	School of Medicine
UP	University of Pretoria
WBOTs	Ward Based Outreach Teams

APPENDIX 2: PROTOCOL

University of Pretoria
Faculty of Health Sciences
Department of Family Medicine

The application of two capability models to support fourth year medical students' learning

PhD

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9 January 2017

Executive Summary

Background: At the School of Medicine (SoM) at the University of Pretoria (UP), students have, during their six years of training, the opportunity to learn in complex and diverse learning environments, ranging from lecture halls and hospitals to community sites, with the final outcome of becoming a 'generalist doctor'. The Longitudinal Community Attachment programme for Students (L-CAS) is one of the curriculated opportunities for students to visit learning sites in primary care settings outside of the tertiary hospitals.

Through L-CAS, students are exposed to the care of patients in a variety of contexts, from the home to the hospital. The sites used in L-CAS visits are all in primary care; complex and different to what the students are used to at the tertiary care learning sites and on campus. L-CAS has evolved and changed since 2008 in response to feedback from students, logistical challenges and national plan changes. The L-CAS programme has been adapted to support and compliment Community Oriented Primary Care (COPC) in its learning objectives and learning activities, with a specific focus on the consultation and the patient in his context.

One of the major objectives of L-CAS is to provide students with opportunities that has the potential to develop their ability to develop an appropriate assessment and management plan for a patient. In order to set an assessment for the patient, the students will need the competencies of consultation, including communication and examination skills, interpersonal skills, ethics, professionalism and critical thinking. In order for a student to be able to set an appropriate management plan for the patient, the student needs a sound understanding of the disease(s) of the patient, the understanding and value system of the patient, the context of the patient and the primary care system, including COPC.

Problem statement: Although L-CAS has been running for eight years, the extent to which L-CAS impacts student learning is unknown. There is no understanding or indication of the learning that takes place in L-CAS, or the impact of the L-CAS visits on the students. Up to date, students have been expected to attend all L-CAS activities and write a short reflection on each visit to be awarded a satisfactory attendance mark. The reflections have not been read or marked in any way, nor have students received feedback on any of their activities.

This study aims to explore and better understand the process of learning that takes place during and after L-CAS visits as a result of the activities of each visit, so that the L-CAS curriculum can be planned and executed to specifically support learning. The three-stage assessment and plan serves to be an objective measurement of a number of competencies that can indicate whether a student will have developed over the course of a year.

Theoretical underpinning: Capability is identified as a theoretical model to describe the learning process, as it addresses more than just development or acquisition of one competency, but rather the development of the individual as a professional and person. Two capability models are identified.

This study will use both the model of capability in medical education, as described by Sandars and Hart, and the model developed by the Family Medicine project team, because both models can contribute significantly to the understanding of student learning in L-CAS. The Sandars and Hart model is very philosophical and strongly grounded in the work of Sen, while the framework of capability from the Family Medicine project team is a practical application.

Model 1: Amartya Sen conceptualised capability as a critique of the narrow economic rationality and self-interested ‘economic man’ model in economics. Although Sen’s model was first described in the economics field, it has been

adapted and applied in the Humanities, Higher Education, and Medical Education fields. According to Sen a person's functioning is linked to the things the person would value doing and these values are linked to capabilities. Capabilities enable a person to make judgements and to act on these. Sen describes capability as 'a person's freedom to achieve well-being' with the focus on both the person's ability to choose and his/her ability to convert that choice into action. This model was adapted for the use in Medical Education by Sandars and Hart.
The Sandars and Hart model will be used to identify and understand students' aspirations and capability sets and their perceptions of the factors that enable them to achieve and those that hinder them from achieving those capabilities that they value or deem important. It will also help with evaluating the students' sense of attainment of these identified capabilities or aspirations.

Model 2: Recognising the potential of the capability model of Sen as an approach to learning, the Family Medicine project team adapted and described the capability model as a practical way of understanding the process of learning in a complex world.

The L-CAS project team considers capability to be a developmental, meaning-making process that happens over time. The capability approach to learning draws on the strong philosophical arguments of Sen, as well as the long established educational theories of learning through practice (Academic Service Learning), self-regulated learning, facilitation, reflection and feedback. It also takes the Higher Education notion of professional capability – that capability hinges on adaptability – into consideration.

The Family Medicine capability model will be used to determine the nature and extent of fourth year medical students' capability through an evaluation of their competence to perform appropriate patient assessments and develop treatment plans for patients encountered in various primary health care service settings. The study will look at the impact of exposure to different

communities in a primary care setting on student learning, examine the key aspects of learning that enable capability as part of the L-CAS curriculum, and identify what enabling scaffolding exists, and may be essential, to develop capability.

Research question: How does the application of the capability models support fourth year medical student learning in terms of performing a three-stage assessment and plan?

The purpose of this study is to explore the application of the two capability models in the context of L-CAS through the self-reported evidence provided by students, with the purpose of informing the future learning strategies in L-CAS.

The Aims:

To describe fourth year medical students in terms of their current learning behaviours and personal attributes.

To apply the two capability models to the reported learning behaviours and evaluate both the models.

The Objectives:

- To determine students' perceptions of what constitutes learning.
- To determine students' perceptions of the key aspects of the Sandars and Hart capability model, namely: students' capability sets and their resources, as well as their understanding of the conversion factors that influence their capability sets.
- To capture students' perceptions of goal attainment of their capability sets.
- To determine students' perceptions of the key aspects of the Family Medicine capability model namely: relationships, identity and knowledge, disruptions and their reactions to the disruption.
- To evaluate the competencies in fourth year medical students that will be required to perform an appropriate three-stage assessment and management plan for a patient.

Methods: Quantitative and qualitative methods will be employed to gather data from the fourth-year medical students who do L-CAS during one academic year. Research instruments will include

- the Rotation Reflective Reports of students,
- a data sheet for the three-stage assessments and plans,
- focus group discussions,
- semi-structured interviews, and
- a questionnaire developed from the literature to investigate the different aspects of both capability models.

Content analysis and grounded theory will underpin the qualitative analysis. The data will be used to describe and understand learning in L-CAS, enabling and hindering factors, and how learning can be optimized. The study will also report on students' capability sets for their personal and professional lives and their perceptions of their attainment of those sets.

Data from the questionnaire, focus groups and interviews will be used to explain and understand the relationship between the learning that will have happened in the group of students that show evidence of capability in terms of formulation of a three-stage assessment and plan and those that do not show evidence of this capability.

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Concept Clarification

Capability: In the context of the Longitudinal Community Attachment programme for Students and this study, capability will be defined as the process of learning and it will be measured by the increased ability of the student to use the consultation competencies effectively in order to develop a three-stage assessment for each patient, and then to make a judgement and develop a management plan. Judgement here is understood as the best possible meaning-making of complex situations.

Competence: Competence involves single loop learning whereby students acquire and master a new skill, attitude or knowledge. The consultation competencies that will be relevant to this study are:

Clinical component
Evidence of competence in history taking
Evidence of competence in examination skills
Evidence of competence in clinical reasoning
Evidence of competence in finding evidence to make a diagnosis
Evidence of competence in decision-making regarding special investigations
Evidence of competence in evaluating compliance in a patient with a chronic disease
Evidence of competence in evaluating control in a patient with a chronic disease
Evidence of competence in evaluating complications in a patient with a chronic disease
Individual assessment
Evidence of appropriate doctor-patient relationship
Evidence of appropriate communication skills
Evidence of the patient's understanding of disease
Evidence of understanding the value system and beliefs of the patient
Evidence of sensitivity to cultural issues
Evidence of sensitivity to language issues
Contextual assessment
Evidence of insight into the context of the patient
Evidence of understanding of the effect of the context of the patient on the disease and of the disease on the context of the patient
Plan
Evidence of appropriate understanding of the disease and its management: Include all the aspects of the three-stage assessment – individual and contextual Plan includes pharmacotherapy as appropriate Plan includes non-pharmacological interventions as appropriate
Evidence of primary care including understanding of COPC Evidence of prevention, health promotion and management of disabilities as appropriate Appropriate integration between different platforms of care

Three-stage assessment and plan: This entails the judgement a student makes about each clinical encounter and includes:

a clinical diagnosis, including aetiology and complications, health prevention and promotion;

a personal assessment of the patient, including their fears, expectations, and values, and the impact of the disease on the person; and

a contextual assessment, including the influence of the context on the patient and vice versa, the health promotion and prevention in the community, and the patient's social structure, family, work environment and local community.

Through analysis of their findings, students are then required to develop a treatment plan to address all the identified challenges, taking into consideration the principles of family medicine and the agenda of the doctor.

Learning sites: These are the geographical areas that students go to during L-CAS activities to meet patients, community health workers, peers and facilitators. These sites range from facilities and institutions including primary, secondary and tertiary hospitals, clinics, old age homes, crèches and hospices, to not-for-profit organisations (NPOs) and health posts in communities where the Ward Based Outreach Teams (WBOTs) are located.

List of Abbreviations

L-CAS	Longitudinal Community Attachment programme for Students
SoM	School of Medicine
UP	University of Pretoria
SANDF	South African National Defence Force
COPC	Community Oriented Primary Care
WBOTs	Ward Based Outreach Teams
CHWs	Community Health Workers
DFMUP	Department of Family Medicine of the University of Pretoria
NHI	National Health Insurance
NDOH	National Department of Health

PHC	Primary Health Care
RRR	Rotation Reflective Reports
CHD	Community Health Diagnosis

1. Introduction

1.1 Background

At the School of Medicine (SoM) at the University of Pretoria (UP), students have, during their six years of training, the opportunity to learn in complex and diverse learning environments, ranging from lecture halls and hospitals to community sites, with the final outcome of becoming a ‘generalist doctor’. The Longitudinal Community Attachment programme for Students (L-CAS) is one of the curriculated opportunities for students to visit learning sites in primary care settings outside of the tertiary hospitals.

1.2 Longitudinal Community Attachment programme for Students (L-CAS)

During the 2007/8 period the SoM identified a need for medical students to spend time in the primary care setting as most of their training happened in the tertiary institutions and at campus. A proposal to address this problem was put together by the Department of Family Medicine of the University of Pretoria (DFMUP) in the form of the Longitudinal Community Attachment programme for Students (L-CAS). The initial focus of the proposed programme was to expose students to the clinical care of primary care patients on an ongoing basis (years one to five) in primary care clinics and healthcare centres within communities. This programme was built on the principles of academic service learning with the objectives of relevant and meaningful service to the community, enhanced academic learning, structured reflection, social responsibility and partnerships, and collaboration. As soon as permission had been granted by the Undergraduate Programme Committee, the implementation team started negotiations with the relevant governmental authorities.

The negotiations and initial planning of L-CAS involved the Undergraduate Programme Committee, students, lecturers from the DFMUP, all the block and rotation chairs and the Gauteng Health Department and Local Authority representatives. Initial planning revolved around incorporating service learning into academic curricula and accommodating the students at the various clinics. Mentors were appointed and trained for each clinic. L-CAS was implemented in the second semester of 2008 for the first-year medical and dental students.

Initially students visited clinics during all their academic blocks and special activities. Logistical support was made available at the DFMUP. Each student was allocated to a clinic in a group of between eight and ten per year. Tasks were jointly developed by the L-CAS team, the clinic representatives and the block representatives. These tasks were linked to the content covered in class. A student portfolio was created with all necessary information, including safety, security, and travel arrangements, timing, planning of visits, tasks and the feedback and reflection forms. Continuous feedback and reflection sessions were conducted with students with the view to improve and change the project as needed.

L-CAS evolved and changed since 2008 in response to feedback from students, logistical challenges within the governmental sector and the national plan that expanded to include Community Oriented Primary Care (COPC). In the first semester of 2009 the project was extended to include all the medical students from years one to five, and dental students from years one and two. In 2009 the South African National Defence Force (SANDF) came on board as a partner and offered four of their clinics as training facilities. Their doctors act as mentors in these clinics. In 2010 the number of clinics were increased to 51 by adding seven clinics from the Northern Ekurhuleni District with a mentor for each clinic.

Unfortunately, the number of mentors needed to be limited in 2010 to 16 due to financial constraints. Since 2013, mentors could not be afforded any more. Feedback from students indicated that mentors played a vital role in their learning experience at training sites, therefore further changes had to be implemented to save the programme.

Because of all the logistical and capacity problems within the clinics, it became clear to the planning team that students need to work in communities to prepare them to be part of the future healthcare solution of South Africa and to fit in with the University's key priority of community engagement. Subsequently the programme has been adjusted and refined in response to local context changes within the primary care setting as well as within the University to incorporate the following changes:

- Developing inter-professional learning by including other students from the School of Health Care Sciences and other faculties in the L-CAS programme.
- Adapting the concept of 'mentors' to 'community-based facilitators'. This will mean that community-based workers from different disciplines will act as facilitators for students from different disciplines doing inter-professional learning in communities.
- Creating a more diverse platform by further expanding the platform to go beyond the clinics to other community based institutions and services, e.g. old age homes, hospices, places of safety, home based care projects, schools and especially COPC sites.
- Exploring partnerships with programmes and students from other faculties working in the same communities.
- Continuing the research about the experience and impact of L-CAS and the Healthy Schools project, and add research to the process, experience and impact of Inter-Professional Learning.

L-CAS is now a formal module (LCP) in the curriculum and runs from year one to year five across all MBChB blocks. With the development of COPC and Ward Based Outreach Teams (WBOTs) in Tshwane in 2011, students

are placed in communities where they work with teams of community health workers (CHWs) whom they accompany to various learning sites.

Although these sites offer many advantages, the logistics and organisation of the visits do pose a serious challenge. The visits are further challenged by factors outside of our control like the uncertainty and problems within the WBOT system regarding wages and related safety issues.

For 2017, the planning of the programme focusses again on COPC with a specific focus on the patient in his context and all the different aspects of the consultation. Each student is exposed to the care of patients in a variety of contexts from the home to the hospital, including patients in old age homes, schools, nursery schools, shelters and clinics. Eight sites have been identified and developed as academic WBOTs, and specific outcomes and objectives for each visit have been defined.

Students should be able to

- experience the patient IN his/her context and understand all the different aspects related to that context,
- practice COPC (students should see the principles in action and experience the link between the home, the clinic, and the hospital),
- understand the function of the healthcare facilities within the communities,
- function in any complex, varying or unfamiliar context/situation,
- communicate effectively with patients and practice interpersonal skills through interaction with different kinds of people,
- do a proper consultation with a patient, including the performance of a three-stage assessment and plan,
- do a proper and appropriate clinical examination and perform the necessary procedural skills,
- display life-long learning skills to acquire the necessary knowledge that will enable them to function in L-CAS,
- practice the necessary IT skills that will enable them to use the IT support offered,

- use reflective skills to aid their learning, and
- learn a new language that will enable them to communicate more effectively with patients.

1.3 Community Oriented Primary Care (COPC)

The National Department of Health (NDOH) has instituted major health care reform to address the health system crisis created by the four epidemics of maternal, new-born and child health; HIV/AIDS and TB; violence and injury; and communicable diseases.[1] In support of the reengineering of Primary Health Care (PHC) and the need to create a learning platform that is relevant and appropriate to the needs of health care in the 21st century, the DFMUP has been involved in the conceptualization, development and implementation of a community oriented approach to primary health.

On 31 May 2011, the re-engineering of PHC was included in the Parliamentary address of the Minister of Health, Dr Aaron Motsoaledi. This innovation involves moving the focus of intervention from institutions (clinics and hospitals) to the structured re-introduction of healthcare at the community coal-face, i.e. as close as possible to where people live. Two of the major challenges and focus points of this plan are to train and deploy outreach teams, consisting of CHWs and professionals, to do home care in municipal wards, and secondly to address school health.

One of the principles on which this initiative by the minister is built, is Community Oriented Primary Care (COPC).[4] COPC is an internationally recognized, integrated approach to PHC that brings health and other professionals, organizations and people together in defined geographical areas to identify and respond systematically to health needs.[2] COPC is user centred primary health care that is:

- built from a community health diagnosis/assessment (CHD),
- rendered in a defined geographical area where relevant role-players have assumed full responsibility,

- rendered close to the individual and the family,
- holistic in its consideration of Community as a Bio-Psycho-Social 'Organism',
- ensuring continuity of care and continuous review of the CHD,
- based on co-responsibility between health care users and service providers,
- integrative between community organisation/s and health education, and
- inclusive of promotion, prevention, primary curative care and rehabilitation.

The DFMUP partnered with Tshwane District (Gauteng Province) to pilot COPC in nine districts in 2011-2013.[3] Subsequently, DFMUP has been, and will continue to be, involved with the City of Tshwane in implementing a COPC approach to primary health through WBOTs in support of the National Health Insurance (NHI).

WBOTs is one of four streams of the NDOH's NHI and district health system's reform. The others are District Clinical Specialist Teams, Integrated School Health Services and the deployment of private General Practitioners in the District Health Services. The WBOTs consist of a professional nurse acting as a team leader and a group of CHWs (usually between 18 and 30).
The team leaders and CHWs were identified as facilitators within the COPC system that can aid the L-CAS student visits to community sites. The L-CAS programme has been adapted to support and compliment this initiative in its learning objectives and learning activities, by incorporating the principles of COPC into the L-CAS objectives and focussing the site visits mainly on the WBOTs.

1.4 Learning

One of the major objectives of L-CAS is to provide students with opportunities that have the potential to develop their ability to develop an appropriate assessment and management plan for a patient. In order to set an assessment for the patient, the students will need the competencies of consultation, including communication and examination skills, interpersonal skills, professionalism and critical thinking. In order for a student to be able to set an appropriate management plan for the patient, the student needs a sound understanding of the disease(s) of the patient, the understanding and value system of the patient, the context of the patient and the primary care system (including COPC).

On-going development of students, health workers and families is integral to the L-CAS/COPC project. Students need to develop the capability to function in any learning site through the ability to make an accurate assessment and plan for each patient they encounter; health workers need to constantly acquire more relevant knowledge and skills; and patients need to be supported and empowered to become agents of their own health. During L-CAS visits students are expected to work with fellow students as well as CHWs, with real patients, in complex contexts, to identify problems and risks, develop a three-stage assessment and plans to address the identified challenges, and then they are expected to identify and address learning needs in response.

The curricula for L-CAS are determined by learning needs identified during daily clinical work, with a specific focus on the content of each of the academic blocks. The learning objectives of L-CAS focus on developing students' competence in making the best available judgement during a patient encounter, in any context, across all the different learning sites. This judgement entails making an appropriate assessment of the patient, including the clinical, individual and contextual diagnosis, as well as a management

plan that addresses the assessment and takes into account the principles of primary health and COPC.

1.5 Problem statement

Although L-CAS has been running for eight years, the extent to which L-CAS impacts student learning is unknown. There is no understanding or indication of the learning that takes place in L-CAS, or the impact of the L-CAS visits on the students. Up to date students were expected to attend all L-CAS activities and write a short reflection on each visit to be awarded a satisfactory attendance mark. The reflections have not been read or marked in any way, nor have students received feedback on any of their activities.

This study aims to explore and better understand the process of learning that takes place during and after L-CAS visits as a result of the activities of each visit, so that the L-CAS curriculum can be planned and executed to specifically support learning. The three-stage assessment and plan serves to be an objective measurement of a number of competencies that can indicate whether a student will have developed over the course of a year.

1.6 Theoretical underpinning: Capability

Capability, as a theoretical framework, can be used to describe the learning process in L-CAS, as it addresses more than just development or acquisition of one competency, but rather the development of the individual as a professional and a person. Two capability models are identified.

This study will use both the model of capability in medical education, as described by Sandars and Hartref?, and the model developed by the Family Medicine project teamref?, because both models can contribute significantly to the understanding of student learning in L-CAS.

Capability introduction:

Amartya Sen conceptualised capability as a critique of the narrow economic rationality and self-interested 'economic man' model in economics.[5] Although Sen's model was first described in the economics field, it has been adapted and used in the Humanities, Higher Education, social justice and other fields as well.[5,6,7]

Referencing! According to Sen a person's functioning is linked to the things a person values doing and these values? are subsequently linked to capabilities. In other words, a person's functioning is linked to the values and interests that enable a person to make choices in life that will provide reason to value that life. Capabilities enable a person to make judgements and to act on these judgements?. In Sen's model the terms 'resources' and 'agency' are described abstractly as the two components that create capability. In other words, according to Sen capability is a person's freedom to achieve well-being. Inter alia, it implies that a person has the opportunities to convert resources into aspirations – to set the goals for well-being and quality of life; to turn personal aspirations into valued doings – thereby achieving these valued things by using real opportunities and resources to reach goals.

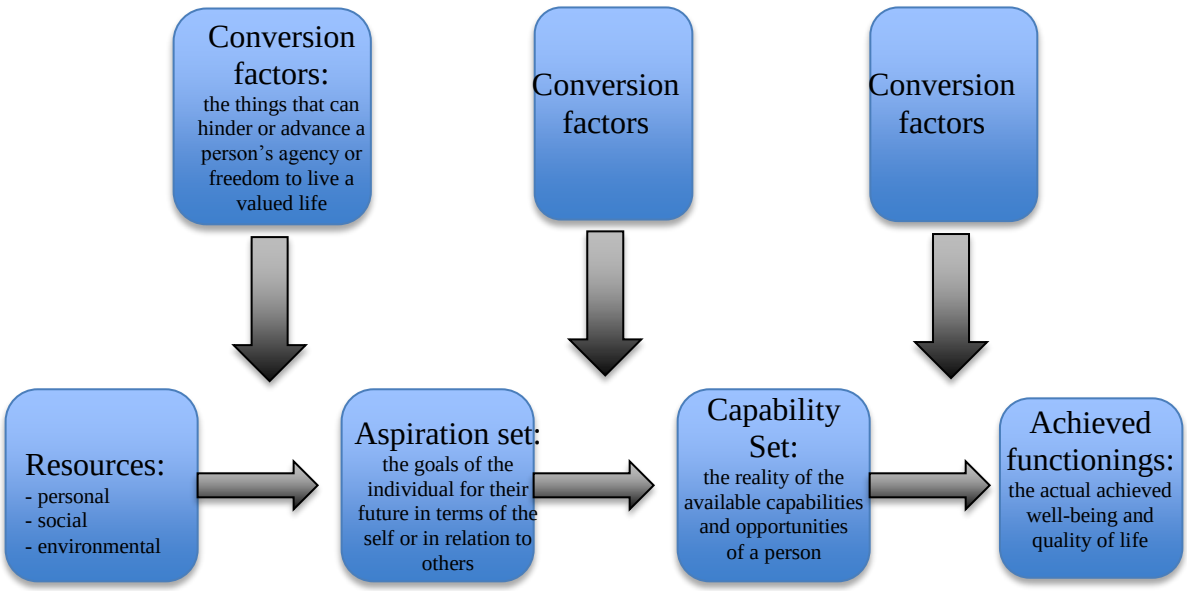
Sen describes capability as 'a person's freedom to achieve well-being'[8], with the focus on both the person's ability to choose and to convert that choice into action – to convert his/her resources into aspirations and functionings. Functionings are described as 'parts of the state of a person – in particular the various things that he or she manages to do or be in leading a life.' [9] Sen adds that '[t]he capability of a person reflects the alternative combinations of functionings the person can achieve, and from which he or she can choose.'[9]

The capability approach rejects the notion that resource plays an integral role in a person's sense of well-being. Resources are seen as only means of enhancing well-being while the focus should be on the intrinsic factors of functioning and capabilities.[6]

Model 1: Sandars and Hart's model for Medical Education:

Recently, this model of capability has been described in the field of medical education and published in an AMEE guide[5], which is seen as the golden standard of practices in medical education. As illustrated in Figure 1 it remains highly abstract and formal, but provides a framework for planning and evaluating curricula.

Figure 1: The process and core concepts of the capability approach in medical education[ref?]



These concepts will be discussed in more depth within the literature section.

The Sandars and Hart model will be used to identify and understand students' aspirations and capability sets (including whether the objectives of L-CAS are part of their desired capability sets or not) and their perceptions of the factors that enable them to achieve and those that hinder them from achieving those capabilities that they value or deem important. It will also help in evaluating the students' sense of attainment of these identified capabilities.

Recognising the potential of the capability model as an approach to learning, the Family Medicine project team has begun to develop the capability model as a practical way of describing the architecture that informs lifelong learning in a complex world.

Model 2: The capability approach to learning:

The L-CAS project team considers capability to be an underlying philosophy and value that is integral to medical education. Capability is considered a developmental, meaning-making process that happens over time. The capability approach to learning draws on the strong philosophical arguments of Sen, as well as the long established educational theories of learning through practice (Academic Service Learning), self-regulated learning[10,11], reflection[12,13] and feedback. It also takes the higher education notion of professional capability, which states that capability hinges on adaptability, into consideration.[14,15,16] The model beliefs that learning occurs through the interaction between persons and their concrete experience.[17,18] This involves having the experience (e.g. an encounter with a patient), reflecting on the experience, forming your own concepts and generalizations of that experience and then testing those in a new situation (on a new patient).

Traditional educational practices are largely not designed to challenge students to perform integratively across thinking, feeling and doing domains or to prepare them to learn from stressful situations.[14] Students therefore do not get many opportunities to develop their practical knowledge of interaction between people, tasks and strategies and to be reflective practitioners – learning to attend to and interpret their own experiences.[28,29]

Students are therefore challenged with tasks that are relevant to the academic block they are busy with, but they are also able to engage with the patients on a personal level and take active part in the service delivery team. The emphasis of these activities is reciprocal learning where the student can also

learn from the community, the other members of the healthcare team and his peers. Capability mobilises individual and collective reflection and cooperation. In essence, it is a self-regulatory process, underpinned by reflective practice that integrates socio-cognitive learning in context.

This new capability model describes learning in a complex world, where the decisions students make may be deemed the best available although they might not be the most appropriate. In taking and applying decisions, students then consciously learn to engage in a self and group evaluative learning process that over time will enable them to make better judgements that are more appropriate to the complexity of health.

Informal learning in the workplace, reflective practice and interactive episodic contexts arw the main suggested sources of professional and workplace based learning.[19,20] Knowledge that will become deep-rooted is often the knowledge that is created when problems are being solved.[20] It is fundamental to each individual's development that s/he learns from experience.[14]

It is possible to demonstrate capability in students through assessed tasks, particularly their development of patient assessment and treatment plans. Students are required to do three-stage assessments i.e. i) a clinical diagnosis; ii) a personal assessment of the patient; and iii) a contextual assessment. From an analysis of what they find, they are then required to develop a treatment plan to address all the identified challenges. Capability is a process of becoming and therefore it must be monitored over time. Capability requires students to question their current understanding and assumptions and create and enact new responses to familiar situations as well as effectively respond to new situations.

The Family Medicine capability model will be used to determine the nature and extent of fourth year medical students' capability through an evaluation of their competence to perform appropriate patient assessments of and develop

treatment plans for patients encountered in various primary health care service settings. The study will look at the impact of exposure to different communities in a primary care setting on student learning, examining the key aspects of learning that enable capability as part of the L-CAS curriculum, and identify what enabling scaffolding exists, and may be essential, to develop capability.

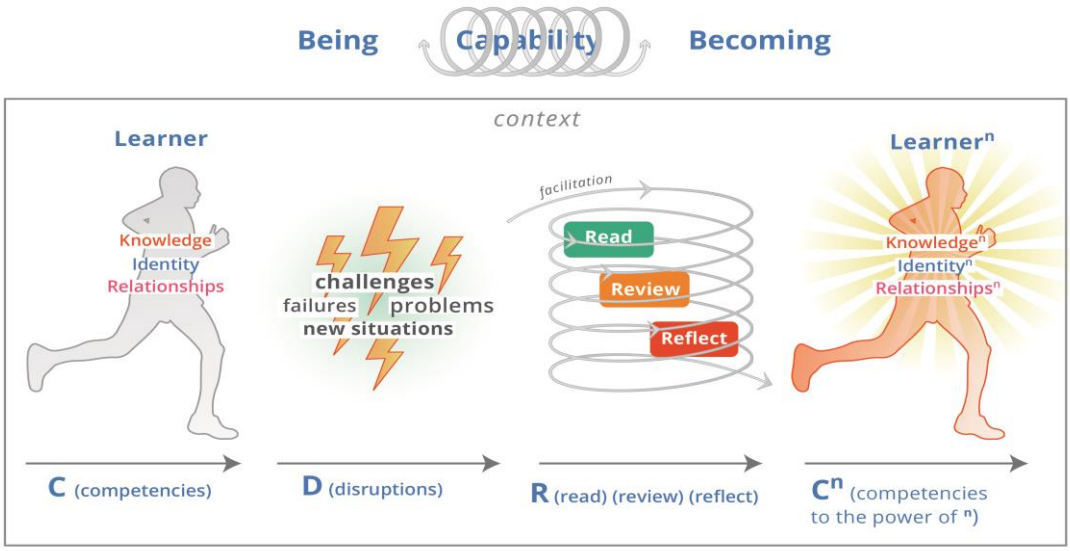


Figure 2: The Capability Approach to Learning[ref?]

2. Research question

How does the application of the capability models support fourth year medical student learning in terms of performing a three-stage assessment and plan?

3. Purpose of study

The purpose of this study is to explore the application of the two capability models in the context of L-CAS through the self-reported evidence provided by students, with the purpose of informing the future learning strategies in L-CAS.

4. Aims

To describe fourth year medical students in terms of their current learning behaviours and personal attributes.
To apply the two capability models to the reported learning behaviours and evaluate both the models.

5. Objectives

- To determine students' perceptions on what constitutes learning.
- To determine students' perceptions about the key aspects of the Sandars and Hart capability model namely: students' capability sets and their resources as well as their understanding of the conversion factors that influence their capability set.
- To capture students' perceptions of goal attainment of their capability set.
- To determine the students' perceptions about the key aspects of the Family Medicine capability model, namely: relationships, identity and knowledge, disruptions and their reaction to the disruption.
- To evaluate the competencies in fourth year medical students who will be required to perform an appropriate three-stage assessment and management plan for a patient.

6. Thesis statement

L-CAS is a curriculated activity that provides medical students with learning opportunities to develop and practice competencies that has the potential to develop their ability to develop an appropriate assessment and management plan for patients across the complex and different learning sites within the primary care setting.

7. Delineation and Limitations

This work will focus on fourth year medical student and follow their progression over one year.

The knowledge generated might not be generalizable to the other training institutions and the subjectivity of the researcher and participants can influence the data.

8. Literature review

8.1 Human development and the capability approach

Human development, quality of life and individual and community well-being, with an emphasis on the importance of financial and material resources, has been considered as central to all human activity.[5] The capability approach has offered a widely considered alternative to this theory of human activity, as research continues to show a lack of association between wealth and quality of life.[22,23]

Amartya Sen is internationally acknowledged to be the first to advocate and advance the notion of capability as central to human socio-economic development. His interpretation of the evidence shows that a person's access to resources and the opportunities that person has to convert the resources to valued ways of living determines the person's quality of life and well-being.[5,6,24] The capability approach advocates the notion that people's well-being and quality of life depend on their opportunities to lead the life they think is important and to be the person they want to be.[24] The focus is on their ability to make their own choices and to put those choices into action, which is also a fundamental part of social justice.[5,6,24] According to this model, resources and financial wealth does not equal quality of life.

Choice and decision-making play an integral role throughout the whole process. Sen also stresses the importance of collective deliberations in decision-making and action. It is noted that because people internalize the formal and informal structures of a community, the rules and norms as well as the moral codes and values, it could be said that the judgements and choices people make are always collective. These adaptive preferences can influence

and constrain an individual at all the points in the capability approach, but reflective practice, with the view of understanding the preference and overcoming any constraints, could provide the individual with understanding of their influence. The notion of critical thinking (knowledge, experience, opinion, judgments, decisions, and positioning) has also been described as being central to young adults becoming capable agents.[25]

Reflection can aid individuals to look critically at their choices and evaluate these by understanding the limitations, and to become more realistic when making decisions in the future. It is emphasized, for the capability approach, that the critical reflection needs a strong evaluator – meaning that the individuals make decisions based on their values, with cognition of the factors that are enabling or constraining their options.[5] Sen also points out that for adults and children there are a whole set of freedoms that depend on the assistance and actions of others and the 'nature of social arrangements'.[25]

Capability has been used extensively over the last decade as a conceptual framework in Economics and Human Development to inform practice in education and increase social justice.[5,30] In higher education the concept of capability has also been examined and evaluated for its applications.[5] It focuses on individuals' freedom to make choices about how they wish to lead 'a valued life'.

Within education, capability has been used primarily to engage in debate about the purpose of education, specifically in terms of issues of social justice and the need to develop individuals' potential to engage in a complex world. The philosophical assumptions that underlie the capability approach resonate with those of education in terms of 'progressive growth and development of the person, to enable meaning-making of complex situations and to use the new knowledge and understanding to inform future actions.'[5]

8.2 Capability in medical education

The Lancet commission report urges all curricula to become more values based and less information driven, which highlights the focus of transforming medical education to meet the healthcare needs of the 21st century.[30] The competency approach has been heavily criticised. One of the core aspects of medical education is that it provides opportunities not only for personal growth but also for professional development. The Lancet commission also highlights the importance of social justice in medical education which needs to attract a wider range of cultures and social diversity. The capability model provides a framework for this new direction of thinking in medical education.[5]

At the heart of the capability model is the notion that a person is able to develop an understanding of valued beings and doings, thus creating a capable being that extends beyond the classroom into the future. Sandars and? Hart adapted the capability model to describe capability in medical education:[5]

The capability approach can be used to aid the medical education system in terms of the design, implementation and evaluation of educational interventions.[32] The way in which we structure our courses as well as the outcomes we set for each course are greatly dependent on our understanding of the competencies and capabilities we desire our student to have. How we think about the end product of our course, i.e. ‘the capable professional’, will determine how we structure our teaching efforts – the learning outcomes that we set – which in turn will influence the teaching and learning methods.[14]

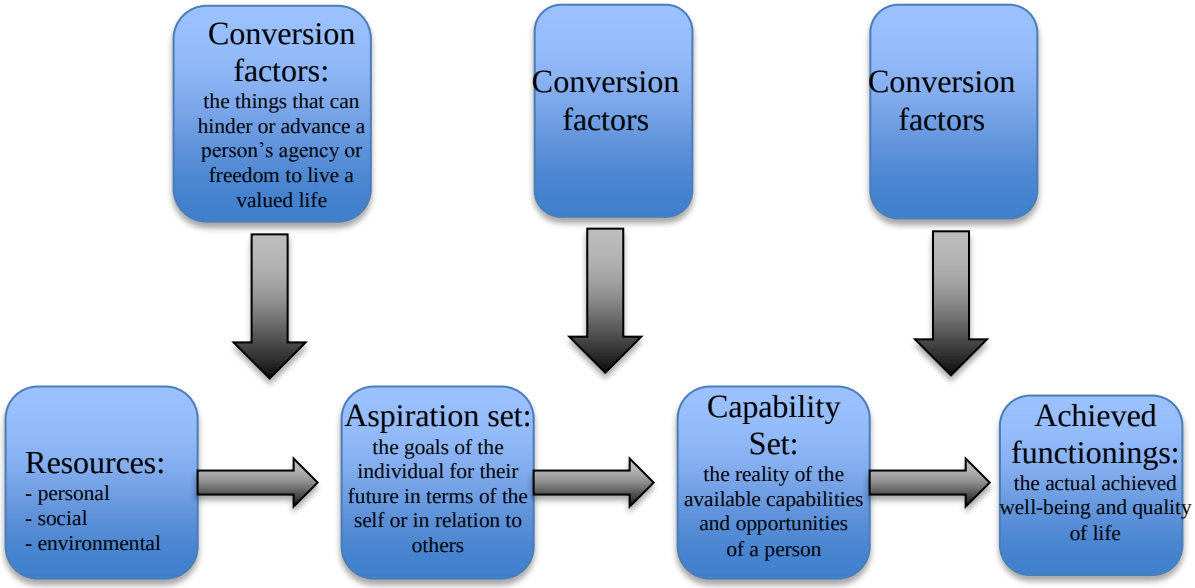


Figure 1: The process and core concepts of the capability approach in medical education

Resources are described in three categories as: 1) personal – psychological (self-efficacy, tenacity, optimism, creativity and resilience); spiritual beliefs; educational (knowledge and skills); financial (wealth or access to wealth); health (good health and absence from disability); material goods (equipment and tools) and access to information, 2) social – cultural and social resources, for example recognition and networks, and 3) environmental – location; weather; etc.[5]

Aspirations are defined as the goals of the individual for their future in terms of the self or in relation to others. Aspirations can help an individual to achieve well-being and quality of life through abstract thinking about the future. Conversion factors do however have an effect on the realization of these aspirations.

The capability set is defined as the reality of the available capabilities (potential functionings) and opportunities of a person.

Achieved functionings are the actual achieved well-being and quality of life of a person derived from the potential functionings, with the impact of conversion factors and choice.

Conversion factors are the things that can hinder or advance a person's agency or freedom to live a valued life. Conversion factors include personal attributes and the social structures within which an individual function. Personal attributes include talent, aptitude and education. The ability to convert resources into capabilities and functionings are dependent on the conversion factors, which for our students act mainly through the educational system.[5]

The role education can play in the development of capabilities in terms of increasing ability and opportunity is described.[34] Education is a conversion factor that can enhance or constrain an individual's freedom and choice. Dewey and Rogers both also stress the importance of the educator in facilitating growth and development in an individual.[35,36] The facilitative approach involves respecting the individual's freedom of choice, but challenging the individual to consider options and make choices for future functionings.[5] Within the capability model, the role of the teacher is defined as facilitator of the person to develop agency to make appropriate choices as individual and for society.

When planning a learning activity for adult learners, it is important to remember that adults have specific purposes in mind, are voluntary participants, require meaning and relevance, require active involvement in learning, need clear goals and objectives, need feedback and need to be reflective.[12]

Students' learning is always affected by their motivation. According to the self-determination theory, controlled motivation happens through external factors,

like family expectations or rewards as well as internalized beliefs about what is expected, while autonomous motivation happens through viewing the material as interesting or important. Autonomous motivation in students lead to better understanding, increased performance and a feeling of competence, and there is a greater chance of such students promoting autonomy in patients.[12]

Sen advocates that there is no key list of capabilities and that each person should have the freedom to develop his own capability set. This offers a big dilemma for educators, especially in an environment where a specific set of learning outcomes with evaluation of achievement of sufficient range and depth of a specific set of capabilities is the norm. In response to this challenge, several methods for the selection of the appropriate capabilities have been suggested by different authors.[6,37,38,39,40]

Sandars and? Hart proposes a method closely related to Sen's. It highlights a person's freedom of choice for their well-being and quality of life. The process has three parts: 1) identify the unit of evaluation, 2) identify what is going to be measured – measures of aspirations, potential functioning and achieved functioning can be performed through questioning or interviews or conducting focus groups, but they do not fully represent a person's capability set – the capability to aspire, to achieve and to identify conversion factors are also of importance, 3) decide whether the identified capabilities would be ranked according to importance.[40]

Robeyn identified five criteria that should be satisfied when deciding on a list of capabilities for any given specification, namely: 1) explicit formulation – the list should be defined, discussed and defended, 2) methodological justification – the method of drawing up the list should be clarified and scrutinized, 3) sensitivity to context – the level of abstraction should be useful within the context that we propose to use the list, 4) different levels of generality – taking

into account the socio-economic and/or political feasibility, 5) exhaustion and non-reduction – the list should include ALL important elements.[6]

When using the capability model in the planning and execution of a course, the capability approach and transformative learning can be facilitated by awarding each student the opportunity to identify the capability set they want to develop during the attachment. Teachers' roles would be to facilitate reflection on the factors that enable and constrain the achievement of their potential functionings. Within the process it is expected that the world view of students are challenged, and reflection would play a central role in the students' agency and freedom to make their own choices for valued functionings. The attachment can be started by asking students to identify a comprehensive list of aspirations that can be refined to a list of potential functionings or capability set to be developed, through a facilitated process of reflection. Freedom of choice is central. The facilitated reflection can focus on their own value system, personal attributes that informed their choices and the realistic constraining factors. Goal attainment scaling can be used then to assign a score to each of the students' identified goals. This score can then be completed at the end of the attachment.[5]

8.3 Professional capability

There is general consensus in higher education literature that professional capability is much more than just the application of acquired knowledge and skill or being able to achieve a given task. Adaptability seems to be key to this notion of capability. Adaptability is seen as being able to apply specific combinations of capabilities in different and changing contexts effectively.[14] Boyatis argues that 'superior performance' is a result of being able to manage complex contexts and interdependency while being innovative and having a self-directed focus on development of future capability.[26]

The ability to cope with unpredictable and changing circumstances as well as the ability to develop yourself further seems to be the two facets of

professional competence.[14] The capable professional is described as being able to creatively respond to the unpredictable[15] and being able to confidently take appropriate action in unfamiliar and changing circumstances.[16]

Drawing on the work of Argyris and Schon's notions of single and double loop learning, Stephenson argues that competence involves single loop learning while capability involves double loop learning whereby practitioners are able to question their current understanding and assumptions and create and enact new responses to familiar situations as well as respond effectively to new situations.[27]

8.4 Methodology to research capability described in literature

Although the capability model is still relatively new to the field of medical education, a few well designed and rigorous studies have been published that describe the process and methods of the application of this model to the field of medical education. In the field of higher education and psychology, however, it is a well-researched topic.

A descriptive design study in higher education and psychology in Australia grouped third year behaviour science students with junior students. The evaluative questions to investigate an action learning activity's potential to develop professional capability were:

1) Does this design achieve its aim in contributing to the development of students' professional capability?

2) Which particular features of the design contributes to the student learning processes and outcomes?

3) What are the specific challenges in applying or generalizing this type of learning design in other settings?

The third years acted as process consultants to the junior client groups. The consultants had to negotiate entry into the group, contracting their services in relation to their task and effective functioning as a team. The junior clients had to develop, present and evaluate a skills training workshop to their peers. Multiple sources were used to collect data quantitatively and qualitatively.

Students kept reflective logs of their meetings, staff members kept notes of issues addressed and raised in consultations and supervisory sessions. Students answered questionnaires about their perceptions about the experience, their evaluation of the various components of the design and their perceived learning outcomes. Random interviews were conducted with a small sample of students. Third year students used the Study Process Questionnaire by John Biggs in this activity.[14]

In a study to develop and test tools to evaluate capabilities in the youth, two topics of interest were developed, namely embeddedness, being a 'member', and critical thinking, 'a process that includes the use of knowledge, experience and education, as well as emotions and imagination, to create one's own opinions and judgments by which the person is able to reach decisions and a positioning in society'.[ref?] In this study, each of the concepts were operationalized and questions were identified that will measure them. For example, people's experiences were measured through three questions: 1) achieved functionings (asking if the respondent went through one or more of a certain list of experiences), 2) lack of experience from an opportunity perspective, and 3) the level and type of impact of the experience. A questionnaire was then developed with statements defining the identified concepts and students had to answer on a Likert scale between strongly agree, agree, disagree of strongly disagree. [26]

Unterhalter et al. state in their article that measurement is one of the big challenges. They regard individual interviews as appropriate to understand individual functionings, triangulated with objective results like test scores.[48]

Evaluation of the Harvard Medical School-Cambridge Integrated clerkship happened through both qualitative and quantitative data. Sources were focus groups, yearend marks, questionnaires to evaluate attitudes and perceptions, self-assessments, OSCEs and patient logs.[44]

8.5 Reflection

The capability approach could be described as the consideration of available options before a decision is made to choose to develop capabilities and functionings, through a reflective process.[5,8] It is agreed that reflection is central to human development and meaning-making of situations. Dewey also grounded the reflective thought in the light of the grounds that support a belief or supposed knowledge, as well as the further conclusions to which it can lead.[23]

Reflection is defined as 'a metacognitive process that creates a greater understanding of both the self and the situation so that future actions can be informed by this understanding'. Reflection is a critical part of self-regulated learning and lifelong learning as well as the capability approach.[13] Reflection can be used in many different ways in our educational activities and should leave space for the individual learners' preferences. It is important for the process to be guided by a mentor so that underlying assumptions can be challenged and tested.[12] Feedback is another important aspect of enhancing the reflective process. The trigger of the reflective process is usually an experience and the outcome is deeper understanding and new meaning-making.[13]

Schon describes the two different kinds of reflection – reflection in action, reflecting during an activity, and reflection on action, reflection after an activity. [18]

Reflection can happen before, during or after an encounter, with the advantage of approaching the activity with a specific goal when reflection also happens before the activity. A value in medical education is the ability of the professional to recognize the underlying personal values, the beliefs and attitudes, and these are honed through reflection. Simply making sense of a situation will not be of meaning unless this new meaning has an impact on future behaviour and decision-making abilities. [13]

Currently, three main approaches to reflection in medical education can be considered: reflection for learning, reflection to develop a therapeutic relationship and reflection to develop professional practice. Reflection for learning is the process through which the learner interprets and integrates the learning experience into exciting knowledge structures. Reflection to develop therapeutic relationships is the process through which a practitioner challenges values and beliefs in order to develop better understanding that will aid the therapeutic relationship.[13] And reflection to develop professional practice?

8.6 Self-regulated learning

Self-regulation theory in medical education is defined as 'the cyclical control of academic and clinical performance through several key processes that include goal-directed behaviour, use of specific strategies to attain goals, and the adaptation and modification to behaviours or strategies to optimize learning and performance'. Academic performance can be enhanced through developing activities that develop self-regulation processes and skills. If we think of self-regulation as a cyclical loop it means that the individual will constantly pro-actively use task-specific or metacognitive strategies, and gather information about the effectiveness of these strategies. It is a process of forethought, performance and self-reflection.[10,11]

Self-regulated learners will prepare for a task by setting goals, understanding the nature and intent of an assignment and making specific plans to perform. Zimmerman postulates that this phase of preparation facilitates reflection and self-evaluation after the task has been completed. Self-regulated learners will also control and direct their thoughts and behaviours during the activity, for example by attention focusing, positive self-talk, mental rehearsal, etc. In the after phase, learners evaluate their performance and seek to identify the reasons for success or failure.[10,11]

The theories of reflection, self-regulated learning and experiential learning therefore feed into the notion of developing capabilities as they all address one or more of the capability elements.

8.7 Longitudinal attachments as a platform for experiential learning

There is general agreement that the product of undergraduate medical education is a capable professional who is knowledgeable and skilful across the broad spectrum of medicine, and according to experts this is difficult to achieve in traditional fragmented and highly specialized environments. Therefore, more and more schools worldwide are introducing longitudinal clerkships because of the added benefit these attachments offer in terms of teaching students professionalism, ethics, and a patient centred orientation.[41,42,43]

Learning occurs when an individual reflects on an experience, and through this process a working theory will be developed that will lead to action. This action will result in another experience and so the cycle continues. The cycle can be entered into at any point and the perception about the starting point will depend on the learning style.[12] Learning occurs by having an experience, but the experience alone does not produce learning – meaning-making is necessary.[13]Involving students in a process of experiencing situations that will challenge them to adaptively and robustly learn, is one way of meeting the challenge of preparing capable professionals.[14]

The application of the capability approach in medical education has been described in terms of a longitudinal community attachment programme for junior students with the expected benefits of greater awareness of preventative and chronic disease management in complex social systems, as well as offering opportunity for personal growth with greater self-awareness and self-confidence, professional identity development and finding relevance within the curriculum.[5,42] The study shows that longitudinal placements enhance students' understanding of patient centred care and the importance

of the context of the patient, namely the life perspective, family dynamics and social dimensions of a person's life.[42]

Because students generally do not get the opportunity to see the patient through a whole episode of illness – from diagnosis to follow up and care at home – and are therefore rarely able to participate actively in the diagnosis, critical thinking and therapeutic decision making of a case, the Harvard Medical School-Cambridge Integrated Clerkship was designed. This educational design was chosen to maximize learning and address issues like retention of fundamental knowledge and skills grounded in a professional perspective and reflective practice. Through this programme students are exposed to a number of diseases that are diagnosed and managed at the outpatient level. The programme also focusses on the teaching of foundational skills like communication skills, professionalism, cultural competence, physical examination and epidemiology, which are not always prioritized as a result of the pressure of clinical care.[44]

The Harvard Medical School-Cambridge Integrated Clerkship found that the continuity of care exposed students to the patients' experience of their illness and their interaction with the different aspects of the health care system. Students had the opportunity to follow a patient from presentation, working through the evaluation and workup of the patient, critically evaluating to develop a diagnosis, management and follow up to get to the outcome. By witnessing this process, students grounded their knowledge, professionalism and ethics in the real issue and found motivation in the feeling of having an impact on patient care.[44]

A study done in Canada found that the home care setting is ideal for students to learn patient centred care and social determinants of health, and are also ideal for inter-professional learning. Students reported high levels of satisfaction and developed an appreciation of their own limitations of scope of practice.[45]

A paediatric residency programme included community partners as co-teachers in continuity clinics, because they found that a one month exposure was not enough to develop desired outcomes. Adult learners are motivated when they can implement their new knowledge and skills immediately in real-life situations, and the cross-disciplinary collaboration was an advantage. The residents and community partners reported an increase of awareness about community resources and better links between the health care system and community resources.[46]

An Australian study identified the importance of peers to achieving the meta-learning goals of critical reflection and learning from experience. They also found that action learning experiences enhance students' abilities to reflect critically, to learn how to learn (broader adaptive capabilities), and to build towards socialization, and offer students a realistic preview of future professional roles. They did identify some challenges to a longitudinal placement.

Challenges that need to be addressed when implementing an undergraduate experiential placement include the following aspects:

- It is unclear and uncertain whether the experience students get are the endpoint of their encounter rather than being the beginning point of systematically learning from the experience.[14]
- Students are often not allowed to practice in responsible roles that require real time decisions with consequences due to safety and ethical considerations. As a result, the learning experience is often more vicarious than experiential.[14]
- Logistical considerations often severely limit experiential opportunities.[14]

For a placement to be beneficial, there needs to be adequate support for students, staff and administrative staff, as well as a continuity of experience. Students should feel that they have enough experience and resources, and

that they are able to take responsibility for their own learning while they learn through problem solving and experience.[42]

8.8 Implications for my study

The capability approach is a relatively new concept in the field of medical education, but provides a framework for understanding students' learning and ability to adapt to an ever changing environment and to carry new knowledge to future change. The role of critical evaluated reflection, self-regulated learning and experiential learning seems to be of importance in understanding the process.

Sandars and Hart adapted the model of capability as proposed by Sen and this adaptation will be used to identify and understand students' aspirations (including whether the objectives of L-CAS are part of their desired aspirations or not) and students' perceptions of the factors that enable them to achieve and those that hinder them from achieving those capability sets that they value or deem important. It will also help in evaluating the students' sense of attainment of these identified aspirations. It would be useful to understand the resources (as described in the Hart model) they use in terms of 1) personal – psychological (self-efficacy, tenacity, optimism, creativity and resilience); spiritual beliefs; educational (knowledge and skills); financial (wealth or access to wealth); health (good health and absence from disability); material goods (equipment and tools) and access to information, 2) social – cultural and social resources, for example recognition and networks, and 3) environmental – location, weather, etc.[5]

Measurement is one of the big challenges. Mix method studies are mostly used with qualitative data. Sources like individual interviews are seen as appropriate to understand individual functionings if triangulated with objective quantitative results like test scores.

9. Methods

This will be a mixed methods study with qualitative and quantitative elements.

9.1 Research Design

This is a multi-component, qualitative and explorative study with quantitative elements. The design takes into account the students' understanding of their own learning as well as factors influencing their learning, and the development in their capability over a period of time related to the concrete evidence of their three-stage assessments in the Rotation Reflective Reports (RRRs) and the analysis of the questionnaires.

9.2 Setting, Population and Sample

All fourth year medical students of the University of Pretoria's medical school of the year 2017 will be invited to participate in this study. Only the data of the students that consent to the study will be used in the analysis of this study.

The fourth-year class is divided into eight groups and each group rotates through eight clinical departments during the course of the year. They have L-CAS activities during each of the rotations and a different objective for each of the rotations' L-CAS visits.

- Palliative care (two rotations): Two of the rotations are dedicated to palliative care and will not be included in this study because they do not complete Rotation Reflective Reports (RRRs).
- Inter-professional rotation (one rotation): Students complete a report on the activities of the discipline they work with and they have to complete an RRR with one patient write-up.
- Community site visits (three rotations): Consist of visits to community sites after which students have to complete an RRR with one patient write-up per visit.
- Consultation training (one rotation): No patient contact, but an RRR is completed.

- Skills development (one rotation): Consists of ENT skills development with limited patient contact (students practice on peers), but with an RRR is completed.

9.3 Research instruments

9.3.1 Reflective Rotation Reports (RRRs)

Students will be required to submit an RRR after each of the rotations (except for the two palliative care rotations) as part of their requirements for the L-CAS module. The RRRs are handed in as hard copies to the Help Desk of the DFMUP and uploaded to clickUP (University of Pretoria's web portal) by each student individually. The hard copies of the RRRs from all the consenting students will be used as data sources.

In the RRR students have to include:

- the patient's personal history,
- available clinical data,
- information specific to the rotation they are busy with,
- the three-stage assessment of the patient,
- a plan for the management of the patient, including how the disease can be prevented or detected early, managed properly and effectively, and how the co-morbidities and disabilities can be managed in the home,
- the challenges they experienced during this visit,
- how they addressed the challenges they faced (read / review / reflect),
- their commitment to acquiring the additional resources needed,
- their most significant learning experience, and
- their reflections on:
- how the activities of the visit changed their understanding of
- the three-stage assessment,
- primary care, and
- the COPC principles,
- how they learned, and
- how they can learn even more.

9.3.1.1 The RRRs will be qualitatively and quantitatively analysed. Broad themes that will be considered are:

- The self-reported learning that takes place and presented evidence of learning activities.
- The support that exists and is deemed necessary by students to enable learning.
- The knowledge, identity, relationships, disruptions, and the read / review / reflect method described by the students.
- Evidence of an accurate assessment (with available data) and an appropriate management plan as described in terms of utilising the different levels of the health care system appropriately and incorporating the principles of primary care and COPC.

9.3.1.2 Quantitative assessment of the three-stage assessment and plan in the RRRs of each student will be conducted to establish change over time. The quantitative assessment will be done on a mark sheet. This will enable the researcher to divide students into two groups: those that show evidence of development of the ability to make a three-stage assessment and plan and those that show no evidence of development of their ability to make a three-stage assessment and plan. The students in the two groups will be linked with their comments and understanding of their own self in terms of knowledge, relationships and identity as well as all aspects of learning.

The researcher and an independent marker will be making a decision about whether evidence of development is present or not. This will be discussed and correlated if there are discrepancies.

9.3.2 Focus group interviews

During September 2017 two focus group discussions will be conducted to understand how students learn during their L-CAS visits. These focus groups will consist of six to ten students each. One group will consist of students that show evidence of development of competency in terms of making an appropriate assessment and plan,

and the other group will consist of students that do not show any evidence of development of that competency yet. The focus group question will be: How did you learn from the L-CAS activities this year? Exploratory questions will follow as needed. The data will be qualitatively analysed.

Semi-structured interviews

9.3.3.1 During October 2017 three to ten randomly chosen students from each group of students (those that show evidence of development of capability and those that don't) that are not part of the focus group discussions will be invited to take part in semi-structured interviews to determine how students use resources, what influence agency in students, what scaffolding is used and deemed necessary, what collaboration happens, whether the judgements they make are evaluated and improved on and how this happens, if at all. If saturation is not reached after the first six interviews, an additional two students will be randomly selected and invited to participate. The data will be qualitatively analysed.

9.3.3.2 Another three to ten randomly chosen students from each group of students that identify the outcomes of L-CAS as part of their personal capability set and those that do not, will be invited to participate in semi-structured interviews to understand the reasons for their choices. The data will be qualitatively analysed.

9.3.4 A questionnaire developed from the identified aspects of the capability models in the literature[5] will be administered by the researcher in the beginning of the year during each of the orientation sessions, and again at the end of the year during the feedback session. The researcher will facilitate the answering of the questionnaire through discussion and explanations, although each student will fill in the questionnaire independently. The data will be quantitatively and qualitatively analysed with correlations between the students that show evidence of capability development over the year and

those that do not. This questionnaire will post open-ended questions and a Likert scale on students perceptions of their:

- recourses,
- capability set,
- attainment of capability set,
- conversion factors,
- knowledge,
- identity, and
- relationships.

10. Data management

Practical aspects considered:

10.1 Confidentiality:

Confidentiality was considered, especially in terms of grouping the three RRRs of each student together and numbering them in terms of earliest rotation to last rotation. The selection of the two groups of students for the focus groups will follow after evaluation of the RRRs. It is proposed that a numbering system is used according to the class list and that the RRRs are numbered as they are handed in, in terms of first, second, third and fourth. L-CAS is evaluated only in terms of successful completion of all activities and therefor students will not be influenced by this evaluation in any way.

Some practical aspects that were considered were confidentiality – especially in terms of grouping the three RRRs of each student together and numbering them in terms of earliest rotation to last rotation. The selection of the two groups of students for the focus groups will follow after evaluation of the RRRs. It is proposed that a numbering system is used according to the class list and that the RRRs are numbered as they are handed in, in terms of first, second, third and fourth. L-CAS is evaluated only in terms of successful completion of all activities and therefor students will not be influenced by this evaluation in any way.

10.2 Security of data

The security of the data is important with respects to storage of hardcopy documents and computer files. All paper-based data will be stored in the DFMUP and all computer files will be password protected.

Another consideration was security of data in terms of storage and computer files. All paper-based data will be stored in the DFMUP and all computer files will be password protected.

11. Ethical considerations

Informed consent will be signed by all participants. Although it would be possible to link a student to the results, the results would not be made known to the students or influence the students' performance in terms of L-CAS in any way.

Addendum 3 – Informed consent.

Because the academic year starts very early and the questionnaires are part of the normal work and deliverables for L-CAS, students will fill in the questionnaire before they have given informed consent for this study. As soon as the study is accepted by the PhD and ethics committees, students will be invited to provide informed consent for the use of the data in the questionnaire and the RRRs that have already been completed, retrospectively. The rest of the data of the RRRs, end of year questionnaire, focus groups and interviews will then be used prospectively.

12. Budget and Funding

NRF Funding: UP Allied Health Doctoral, NRF Freestanding Block Grant Scholarship, R 35 000 per year for five years' part-time study.

Data management:		60 000
Printing of questionnaires	5 000	
Data capturing	10 000	
Data transcribing	10 000	
Telephone costs	5 000	
Travel costs	5 000	
Miscellaneous	25 000	
Thesis submission:		25 000
Language editing	15 000	
Binding	10 000	
Outputs		90 000
Travel and accommodation, conference costs	55 000	
Publication costs	35 000	
Total		175 000

13. Logistics, Time Schedule and Action Plan

All the data will be kept and managed in the DFMUP.

Gant chart – Addendum 1

Professional activities and forms of data – Addendum 2

14. Anticipated impact

A proposal will be developed that can inform the curriculum activities for L-CAS, to optimize learning for capability in terms of making an appropriate assessment and management plan for a patient.

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February 2021

Addendum 1: Gant chart

	Jan '17	Feb '17	Mar '17	April '17	May '17	June '17	July '17	Aug '17	Sept '17	Oct '17	Nov '17	Dec '17	Jan '18	Dec '18	2019	2020
Protocol preparation																
PhD Committee																
Ethics Committee																
Printing and preparation of questionnaires and evaluation sheets																
Orientation and feedback sessions with all groups –questionnaires																
Informed consent from students																
RRRs from students and data analysis starting																
focus group interviews																
Semi-structured interviews																
Data transcription and analysis																
Write up																
Articles written																
Conference presentations																

Addendum 2: Professional activities and forms of data to achieve each aim and objective

Aim:	Research Objective	Source of data and Data Collection	Methods	Output	Data Analysis	Quantitative / Qualitative
To describe fourth year medical students in terms of their current learning behaviours and personal attributes	To determine students' perceptions on what constitutes learning.	RRRs	Text analysis	Identify and evaluate students': - Most significant learning experience - Reflection on: ○ how the activities of the visit change their understanding of ▪ the three-stage assessment, ▪ primary care ▪ COPC principles. ○ How students learn – their own perception ○ How students can learn even more – own perception	Text analysis: • Themes and descriptive statistics	Qualitative and Quantitative
		Students who show evidence of increased capability Students who show no evidence of increased ability	Semi-structured interviews and Focus group interviews	Deeper understanding of: - process of learning - learning behaviour - enabling and hindering factors	Text analysis	Qualitative
To apply the two capability models to the reported	To evaluate capability in fourth year medical students specifically in terms of the	RRRs x 4 for each student (from Jan – Sept) and data capture sheets	Text analysis – data capture sheet x 4 for each student	Evaluation of competence to set an assessment and plan and the development of the competence over time	Descriptive statistics	Quantitative

learning behaviours and evaluate both the models	development of an appropriate three-stage assessment and management plan for a patient, over one year of L-CAS activities.			Compare and contrast the learning behaviours and process of students who are capable and students that do not show evidence of capability		

APPENDIX 3: QUESTIONNAIRE

TITLE OF STUDY: **Exploration of two capability models to support the learning of fourth year medical students in the Longitudinal Community Attachment programme for Students.**

Dear Student

1) INTRODUCTION
I invite you to participate in a research study. This information leaflet will help you to decide if you want to participate. Before you agree to take part, you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the investigator Dr Marietjie van Rooyen, 082 785 4500.

2) THE NATURE AND PURPOSE OF THIS STUDY
The aim of this study is to understand how you as a student learn in L-CAS, especially in terms of developing the ability to develop a three-stage assessment and plan for each patient you encounter during your L-CAS activities.

You as a student are a very important source of information on your aspirations and capabilities, your resources, what enable you to learn and what hinder you to learn, your understanding of yourself, your knowledge and your relationships, and how all of that change over a year.

3) EXPLANATION OF PROCEDURES TO BE FOLLOWED
This study involves the analysis of data of two questionnaires: the one that you filled in during the orientation session in the beginning of the year and one at the end of the year; the analysis of the data in your Rotation Reflective Reports; and might include participation in semi-structured interviews, as well as focus group discussions.

The questionnaire asked you some questions about your goals and aspirations, what resources you have to achieve those, how far you are in terms of achieving them, your ideas and perceptions about your own knowledge, identity (your view of yourself) and relationships (quality and networks), and how you learn.

These questionnaires had to be completed to comply with the requirements of L-CAS.
This was part of your orientation and will be part of your feedback session and will take about an hour of your time. The questionnaires, Rotation Reflective Reports, as well as the interviews and focus groups will be part of the academic programme of L-CAS. If you provide consent, the data will be used for this study.

The interviews and focus group discussions will take about an hour of your time. Students who show clear evidence of increased ability to develop an assessment and plan for a patient, and students who show no evidence of increased ability to

develop an assessment and plan for a patient will be invited randomly to participate in the interviews and focus group discussions.

4) RISK AND DISCOMFORT INVOLVED
There are no risks in participating in the study. The results of the study will not influence your performance in L-CAS in any way.

5) POSSIBLE BENEFITS OF THIS STUDY
Although you will not benefit directly from the study, the results of the study will enable us to create a framework that can inform the learning objectives and activities in the L-CAS project in the future.

6) WHAT ARE YOUR RIGHTS AS A PARTICIPANT?
Your participation in this study is entirely voluntary. The questionnaires, interviews and focus groups are compulsory for the module, but you can however refuse to
participate in the study or stop at any time during the study or interview or focus group
without giving any reason. Your withdrawal will not affect you or your successful completion of L-CAS in any way.

7) HAS THE STUDY RECEIVED ETHICAL APPROVAL?
This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria.
A copy of the approval letter is available if you wish to have one. The contact information of the Research Ethics committee is: Tswelopelo Building Level 4, Rooms 4-59 and 4-60; 012 356 3084 or 012 356 3085

8) INFORMATION AND CONTACT PERSON
The contact person for the study is Dr Marietjie van Rooyen; 082 785 4500.
If you have any questions about the study, please contact her at any time.

9) COMPENSATION
Your participation is voluntary. No compensation will be given for your participation.

10) CONFIDENTIALITY
All information that you give will be kept strictly confidential. Once we have analysed the information no one will be able to identify you. Research reports and articles in scientific journals will not include any information that may identify you.

CONSENT TO PARTICIPATE IN THIS STUDY

I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study. I have also received, read and understood the above written information (Information Leaflet and Informed
Consent) regarding the study. I am aware that the results of the study, including personal details, will be anonymously processed into research reports. I am

participating willingly. I have had time to ask questions and have no objection to participate in the study. I understand that there is no penalty should I wish to discontinue with the study and my withdrawal will not affect marks in any way.

I have received a signed copy of this informed consent agreement.

Participant's name …….....(Please print)
Participant's signature: .....…… Date.....

Investigator's name .....……...(Please print)
Investigator's signature .....…… Date.….....

Witness's Name .....…….....(Please print)
Witness's signature .....…….. Date.….....

	Identified the dream	Identified the resources needed to achieve this dream	Started with acquiring the resources needed to achieve this dream	Achieved some part of the dream	Achieved most of the dream	Achieved my goal
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Student name: **Group:**

Student number:

Date:

What would you like to do and be in the future? Where are you now in terms of achieving that?

What would you like to be and achieve in L-CAS this year? Where are you now in terms of achieving that?

	Identified the dream	Identified the resources needed to achieve this dream	Started with acquiring the resources needed to	Achieved some part of the dream	Achieved most of the dream	Achieved my goal
1						
2						
3						
4						
5						

6						
7						
8						
9						
10						

What would make it easier for me to achieve my aspirations / ambitions?

What would make it harder for me to achieve my aspirations / ambitions?

For each of the following, please explain what your understanding is of your own life / situation, in terms of identification and significance:
1 – not significant at all; 2 – somewhat significant; 3 – significant; 4 – very significant

Your Resources:

What are your **personal resources** and how do you use them?:

Please now consider each of the following in terms of **personal resources**:

- Psychological

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Spiritual

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Educational

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Financial

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Health

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Material goods

1	2	3	4

How significant is this in your life in terms of realising your aspirations?

- Access to information

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

What are your **social resources** and how do you use them?:

Please now consider each of the following in terms of **social resources**:

- Cultural

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Networks

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

What are your **environmental resources** and how do you use them?:

Please now consider each of the following in terms of **environmental resources**:

- Natural (location)

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Geographical

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

- Climate

How significant is this in your life in terms of realising your aspirations?

1	2	3	4

Conversion factors:

How does the following attributes enable or constrain you in attaining your aspirations / ambitions?

Personal attributes

How significantly does this enable you in terms of realising your aspirations? | 1 | 2 | 3 | 4 |

How significantly does this constrain you in terms of realising your aspirations? | 1 | 2 | 3 | 4 |

Social structures

- Access and availability of resources in institutions

How significantly does this enable you in terms of realising your aspirations? | 1 | 2 | 3 | 4 |

How significantly does this constrain you in terms of realising your aspirations? | 1 | 2 | 3 | 4 |

- Policies and Programmes

How significantly does this enable you in terms of realising your aspirations? | 1 | 2 | 3 | 4 |

How significantly does this constrain you in terms of realising your aspirations? | 1 | 2 | 3 | 4 |

- Laws

How significantly does this enable you in terms of realising your aspirations? | 1 | 2 | 3 | 4 |

How significantly does this constrain you in terms of realising your aspirations?

1	2	3	4

- Cultural patterns

How significantly does this enable you in terms of realising your aspirations?

1	2	3	4

How significantly does this constrain you in terms of realising your aspirations

1	2	3	4

Please describe yourself in terms of your:

My Knowledge:

- Myself:

- How and where did you learn about the three-stage assessment and plan?

- What resources did you use to learn?

- Describe the access you have to information regarding the three-stage assessment and plan for a patient

My Identity:

- My identity – my confidence / motivation / belief / spiritual values etc.:

- Do you have confidence in setting a three-stage assessment and plan for a patient? Why?

1 – not at all 2 3 4 5 6 7 8 9 10 – very

- How motivated are you to set a three-stage assessment and plan for a patient? Why?

1 – not at all 2 3 4 5 6 7 8 9 10 – very

- How self-efficient are you in setting a three-stage assessment and plan? Why?

1 – not at all 2 3 4 5 6 7 8 9 10 – very

- Do you believe that you can set a three-stage assessment and plan? Why?

1 – not at all 2 3 4 5 6 7 8 9 10 – very

My Relationships:

- My relationships:

- Describe how your social networks contributed to your ability to set a three-stage assessment and plan:

- Describe how the interactions with colleagues contributed to your ability to set a three-stage assessment and plan:

- Describe how your interactions with patients contributed to your ability to set a three-stage assessment and plan:

- Describe how your interactions with your teachers contributed to your ability to set a three-stage assessment and plan:

Evaluation of three-stage assessment and plan
Student name:
Number of RRR:

	Not applicable	Not included	Included but no evidence of understanding	Some understanding	Mastery of content
Assessment:					
Clinical component					
▪ Evidence of competence in history taking					
▪ Evidence of competence in examination where appropriate					
▪ Evidence of competence in clinical reasoning by setting an appropriate differential diagnosis					
▪ Evidence of competence in finding evidence to make a diagnosis					
▪ Evidence of competence in decisions regarding special investigations					
▪ Evidence of competence in evaluating compliance in a patient					
▪ Evidence of competence in evaluating control in a patient					
▪ Evidence of competence in evaluating complications in a patient					
Individual assessment					
▪ Evidence of appropriate doctor–patient relationship					
▪ Evidence of appropriate communication skills					
▪ Evidence of individual assessment of the patient					
▪ Evidence of sensitivity to cultural issues					
▪ Evidence of sensitivity to language issues					
Contextual assessment					
▪ Evidence of insight into the context of the patient					
▪ Evidence of understanding of COPC					
Plan					
• Evidence of appropriate understanding of the disease and its management: ○ Include all the aspects of the three-stage assessment – individual and contextual ○ Plan includes pharmacotherapy as appropriate ○ Plan includes non-pharmacological interventions as appropriate					
• Evidence of primary care including understanding of COPC ○ Evidence of prevention, health promotion and management of disabilities as appropriate ○ Appropriate integration between different platforms of care					

Evidence of development of competence in setting a three-stage assessment and plan since last RRR Y / N
(movement of evaluation in more than half of the criteria)