

The implementation of a portfolio assessment system for a  
Rural Clinical School in South Africa.

What can be learned from the implementation of portfolios as  
an assessment system in a rural clinical school?

Jennifer Jane Stidworthy

Supervisor: Prof H. Conradie

Co-supervisor: Mrs. E Smuts

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## Abstract

A portfolio assessment system was designed to meet the needs of a Rural Clinical School education platform, hosting final year MB ChB students for the duration of their final year. A study entitled "What can be learned from the implementation of a portfolio assessment system, to be used in the assessment of clinical reasoning of final MB ChB students placed in a Rural Clinical School in South Africa?" was conducted. The experience of educators and students during this process was explored. The findings are in keeping with the literature. Van Tartwijk & Driessen 2009, Eley et Al 2002, Lake & Ryan 2004, Burch & Seggie 2008 claim that portfolios drive deep student learning and develop clinical reasoning. Burch & Seggie (2008) offer an assessment tool which has proved feasible within the South African setting on which this portfolio assessment system was modelled.

The assessment tool design faced a number of challenges within the RCS setting which were addressed during a review process. The portfolio assessment system is viewed as a work in progress requiring further development. Despite the constraints and challenges, both staff and students unanimously supported the development of patient case studies within the design as a valuable learning tool.

## Abstrak

'n Portefeulje assesserings sisteem is ontwerp om die behoeftes van 'n UKWANDA Landelike Kliniese Skool opvoedings program wat die gasheer van die MB ChB student tydens hul finale jaar is, na te kom. 'n Studie genaamd " Wat kan geleer word uit die implementering van 'n portefeulje assesserings sisteem, wat gebruik gaan word om die kliniese redenering te bepaal van finale jaar MB ChB student wat geplaas is in 'n Landelike Klinieke Skool in Suid Afrika? " is uitgeoefen. Die ervaring van die dosent, so wel as die studente, is ondersoek. Die bevinding is in lyn met die literatuur. Van Tartwijk & Driessen 2009, Eley et Al 2002, Lake & Ryan 2004, Burch & Seggie 2008 beweer dat portefeuljes dryf student tot diep studie en ontwikkel kliniese redenasie. Burch & Seggie (2008) bied 'n assesserings (hulp)middel aan wat toepaslik en uitvoerbaar is in die SA konteks, waarop die portefeulje assessering sisteem gebaseer is.

Die ontwerp van die assesserings (hulp)middel het vele uitdagings binne die RCS opset in die oog gestaar. Dit is aangespreek tydens 'n proses van hersiening. (Lather, 2006). Die portefeulje assesserings sisteem word gesien as 'n werk onder hande en vereis verdere ontwikkeling. Ten spyte van die beperkinge en uitdagings het beide die staf en die student

onomwonde die ontwikkeling van pasiente gevalle studies, binne die ontwerp, as 'n waardevolle leermiddel gesien.

### **Acknowledgements**

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My family have been amazing throughout this journey; thank you to each of you. My community of practice would never be complete without all of you to keep me firmly grounded.

I salute those who bounce along un-tarred roads to work every day and who live in areas where neither ambulance nor water services can be taken for granted. Thank you for caring. Thank you to those who have taken the time to record the issues affecting rural health. May time spent in rural medicine become a norm for all our health science graduates.

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## Chapter 1

### 1.1 Introduction

This chapter introduces the reader to the context of the study, the problems statement and the research question and objectives, as well as a broad outline of the research methods and ethical considerations.

### 1.2 Title

The implementation of a portfolio assessment system for a Rural Clinical School (RCS) in South Africa. What can be learned from the implementation of portfolios as an assessment system in a Rural Clinical School?

### **1.3 Background to the rural education platforms in medical education**

Several studies have shown the placement of students in rural settings to be feasible (Eley, Young, Wilkinson, Charter & Baker, 2009. Tesson, Curran, Pong and Strasser, 2005. Worley, et al., 2000). Rural programmes vary globally and range from short term placements to those offering entire undergraduate medical degrees in rural settings (Tesson, Curran, Pong, Strasser, 2005. Rourke, 2010. Botman, 2010).

South African medical schools are not producing enough doctors to meet the local needs (Burch, 2007. Bateman, 2011. Strachan et al., 2011). Increasing the capacity of universities requires expanded teaching platforms. In response to this need, rural pilot sites have been developed (Bateman, 2011). The need for funding to develop pedagogies appropriate for these rural teaching platforms has been identified and the role of government support and funding is seen to be tantamount to their success (Tesson et al., 2005. Hugo in Bateman, 2011). The integration of rural health varies between South African institutions. The University of Stellenbosch is the first South African university to place MB, ChB students in a RCS for their entire final year of study (University of Witwatersrand, 2009).

The Ukwanda Centre for Rural Health was established in 2001, providing undergraduate and postgraduate health sciences students from the University of Stellenbosch with rural placements, research and service experience (University of Stellenbosch, 2010). The establishment of the Ukwanda Rural Clinical School (URCS) in 2011 is hoped to strengthen medical services in this area (Botman, 2007) and is seen to promote the university's ethos of social accountability (Wilson, Bouhuijs, Conradie, Reuter, van Heerden & Marais, 2008. Fish, 2009)

In order to progress from the final 6<sup>th</sup> year of medicine, all Stellenbosch University medical students are required to meet the requirements of a high stakes end of year summative assessment. Access to this assessment is made possible by an accumulative, composite year mark made up of a number of different assessments. The new teaching environment in the URCS enabled the introduction of new assessment techniques. While some of the assessment methods traditionally used in the Tygerberg Hospital clinical environment were maintained, a portfolio assessment system aiming to promote learning and assessing clinical reasoning was introduced at URCS.

Two rotations were offered to URCS students (Study Guides, 2011). A discipline specific rotation similar to that being used at Tygerberg Hospital will be referred to as a traditional rotation (Worcester Hospital). A primary care non discipline specific rotation within a district hospital will be referred to as a longitudinal rotation (Ceres Hospital).

A longitudinal integrated rotation

#### **1.4 Portfolio assessment for Ukwanda Rural Clinical School**

Moving students away from main campus presents many challenges for the university, one of which is the assessment of learning within the rural placements. It is to this end that a portfolio assessment system was designed and implemented. The portfolio assessment system designed was adapted from one originally designed by Burch and Seggie (2008) which has proven to be feasible, valid and reliable within a South African context and is currently in use at the University of Cape Town. In 2010, the development of the portfolio assessment system design included collaboration with consultants from the URCS, academic consultants from Stellenbosch University and an external specialist in portfolio assessment.

Formative assessment provides a progress guide during the learning process by identifying learning gaps. These gaps may be knowledge based, skilled based or defined by professional attributes (Dreyer 2008). Within the design, formative assessment focused on the promotion of learning, shifting the focus to assessment *for* learning rather than assessment *of* learning (Leahy et al.2005). Formative assessment within the study guide (Longitudinal Integrated Rotation, 2011. Introduction to URCS, 2011 ) was defined as “ongoing and used as a learning opportunity” (University of Stellenbosch 2011:3). Formative assessment was addressed during student interactions with consultants, individual and small group tutorials, on ward rounds and during the interactive academic tutorials (University of Stellenbosch 2011). Formative assessment was not formally recorded or monitored for the traditional rotation students, but a midyear formative assessment was conducted for the longitudinal students.

Summative assessment provides a measure against which student learning can be judged (Dreyer, 2008). Within the URCS portfolio assessments, the summative assessment was placed at the end of each clinical block for the traditional rotation students and at the end of the academic year for the longitudinal students. Marks obtained from the summative assessment contributed towards an access mark required for access to the end of year final MB,ChB examination.

Discipline specialists tasked with teaching, supporting and mentoring the 2011 rural placement students were also appointed in 2010 as clinical educators. Clinical educators from the Worcester Hospital which catered for traditional rotation students included representatives as follows (Introduction to URCS, 2011) :

Obstetrics and Gynaecology	2
Paediatrics	2
Surgery	2
Psychiatry	1
Internal Medicine	2
Orthopaedics	1
Family Medicine	1

Two Clinical educators from the District Hospital which catered for the longitudinal students were originally appointed, but one resigned before the start of the 2011 academic year.

Ceres hospital	1
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A dedicated portfolio workshop was held in December 2010. This workshop served to orientate clinical educators, and other staff likely to work with the 2011 rural placement medical students, to the portfolio assessment system. Learning principles and principled assessment as applied in the designed portfolio assessment system were central to the workshop and discussion. This workshop was facilitated by a portfolio assessment specialist and the MB, ChB Rural Late Clinical Rotation Chairperson was an interactive workshop.

Continued support in managing the portfolio assessment system was provided to clinical educators by the MB, ChB Rural Late Clinical Rotation Chairperson during academic staff meetings.

Further clinical educator training took place at a second portfolio assessment workshop which was convened in May 2011. This workshop was attended by students, clinical educators and other relevant medical staff. The workshop was interactive and included a demonstration of an assessment and the scoring using the rating tool. This provided the opportunity for the development of assessor skills.

Two models were offered according to placement (Conradie et al., 2012). The placements for Worcester Hospital followed traditional discipline specific rotations as used in Tygerberg Hospital. These rotations were supervised by specialists within a discipline. The development of portfolios and formative assessment extended throughout rotations, culminating in a summative portfolio assessment at the end of this time.

The longitudinal model provided an integrated approach supervised by the family physicians in Robertson, Swellendam and Ceres with mentorship provided by visiting specialists. Portfolios were developed over the year. A formative assessment occurred in May and the final summative assessments for the entire portfolio at the end of the URCS placement. Learning outcomes for both groups were constant.

The portfolio assessment system instructions were provided to students in the student study guides. Some requirements for longitudinal and traditional rotation placements were adjusted to meet the requirements of their placements.

Students were required to conduct a specified number of patient studies of patients they had actively managed to guide their learning and to compile these in a portfolio. The documentation process was specified in the URCS study guides. Learning objectives from each patient study were identified in consultation with staff in the clinical setting. Opportunity for discussion and learning was provided during the clinical placement and tutorials, forming formative assessment in the development of learning. Using evidence from the literature was encouraged. Completed portfolios were presented to assessors at the time of the summative assessment. Assessors selected two cases for discussion using 6 identified questions to guide the assessment. The portfolio documents themselves were not rated. Assessment was expected at the level of an intern. The presence of a family physician specialist at assessment was encouraged where this was feasible.

Developing parity of assessment between the Tygerberg campus and the Rural Clinical School was a perceived challenge. Van Tartwijk and Driessen (2009) identify the need for a structured induction and ongoing support during the introduction of portfolios if they are to be a positive learning experience for students and a successful assessment tool. Reflection, evaluation and informed adjustment are a process required in refining and improving a new educational approach (Leitch & Day, 2000). Given that both the academic environment and the assessment system were new, the need for careful monitoring and appropriate adjustments to the portfolio assessment system were indicated.

### **1.5 Problem statement**

The portfolio assessment system was designed to assess clinical reasoning of the final year MB, ChB students placed at the URCS for the duration of 2011. This new portfolio assessment system was implemented in a new rural clinical school setting. Prior experience in using portfolios for assessment amongst the clinical educators was limited. None of the students had previous experience of using portfolios for assessment. It was anticipated that

challenges would accompany the successes of this new assessment system. The experiences of the clinical educators and students using the portfolio assessment system were identified as a valuable resource for making adjustments to the portfolio assessment. Both the positive lessons learned and deficits identified guided adjustments to promote quality of the processes within the academic year of the study, as well as to plan for improvements to the design for the following year.

### **1.6 Research question**

The implementation of a portfolio assessment system for a Rural Clinical School in South Africa. What can be learned from the implementation of portfolios as an assessment system in a Rural Clinical School?

### **1.7 Aims and objectives**

The aim of this study was to explore the experience of both educators and students with a view to refining and improving the system for current and subsequent students.

The following objectives for the study were identified:

1. To explore the experience of students using the portfolio assessment system as a formative and summative assessment tool.
2. To explore the experience of clinical educators using the portfolio assessment system as a formative and summative assessment tool.

### **1.8 Summary of the methodology**

A qualitative study with a case study design was selected. A document review and semi-structured interviews were used to collect qualitative data which was subsequently analysed.

### **1.9 Ethical consideration**

This study which commenced in December 2010 was approved by the Ethics committee of the Faculty of Medical and Health Sciences, University of Stellenbosch, approval number 10/11/361. Participation was by informed consent and data was securely stored.

### **1.10 Chapter overview**

This chapter has provided the reader with the background to the development of a portfolio assessment system to be used in the Ukwanda Rural Clinical School. The aims, objectives and an outline of the methods underpinning this study have been presented. The following chapter will further explore the relevant literature.

## **Chapter 2 Literature review**

### **2.1 Introduction**

Evidence that portfolios were becoming a tool to be utilised in medical learning and assessment was published in the last decade of the last century. Since then, support for portfolios as a tool to be included in the pedagogical repertoire has been strengthened. This chapter serves to review the literature pertinent to the development of the URCS portfolio assessment system.

### **2.2 Defining portfolios**

Portfolios are dynamic learning and assessment tools used in a variety of ways in health science education. They offer a flexible tool that can be designed according to need which can offer educators with valuable insights into learner competence (Driessen et al., 2007) as well as evidence of targeted learning (van Tartwijk & Driessen, 2009). Furthermore, portfolios are seen to be useful in promoting professional development, the promotion of learning and critical thinking (Lewis and Baker, 2007).

### **2.3 Portfolio learning and assessment**

The literature strongly supports the value of portfolios on two fronts. Firstly to drive student learning and secondly as a dependable assessment tool in medical education providing authentic patient data to assess student clinical reasoning (van Tartwijk & Driessen, 2009, Eley et al., 2008. Lake & Ryan, 2004. Burch & Seggie, 2008). Snadden, Thomas & Challis (1999), claim that portfolios may be considered the ultimate educational tool in terms of meeting the criteria of good practice in adult learning.

Portfolios provide authentic evidence of student learning in the clinical setting for undergraduate medical students (Burch & Seggie, 2008). Reflective learning, the catalyst for learning, is inherent in the success of the portfolio to promote learning (Snadden, Thomas & Challis, 1999. van Tartwijk & Driessen, 2009). Portfolios have been used to track student development and promote learning that was both ongoing and occurred at a deep level (Göran, Hovenberg & Edgren, 2006). Portfolios can be used in the promotion of learning and both formative and summative assessment (van Tartwijk & Driessen, 2009). While they have been predominantly used for formative assessment, use in summative assessments is expanding (Roberts, Newble & O'Rourke, 2006).

Gordon (2003) regards the portfolio as a valid assessment instrument, identifying the underlying student motivation as providing authenticity which provides quality assurance in the absence of reliability. In response to curricular changes at Dundee Medical School, Davis et al (2001) evaluated the use of portfolios in final year assessment, finding the assessment tool to be both “powerful” and useful.

## 2.4 Portfolios in South Africa health science education

In order for portfolios to be feasible assessment tools, they need to be affordable within the South African setting. In their literature search, Burch and Seggie (2008) estimate an average of 170 minutes being spent on portfolio reading and oral examination per candidate for summative assessment in European and Australian studies. Gordon (2003) does not stipulate time spent reading portfolios, but has placed the time spent on interviewing and report writing at 60 minutes per candidate.

Burch and Seggie (2008) developed an assessment approach using portfolios. A global rating scale was used by assessors during the assessment with a 25 minute average for each interview and undisclosed time for further write up. Portfolios were assessed using a structured interview scored using a standardised questions guide the assessment which are scored using a rating scale (Table 1). The actual portfolio was not assessed or graded. Patient studies were selected from a detailed index system inherent in the portfolio design and student learning was assessed in a structured interview.

Assessment tool used in the summative portfolio assessment		Case A			Case B		
	Guide for Examiners	Poor	Adequate	Good	Poor	Adequate	Good
1	Clearly identifies patient's presenting problems	1 2 3	4 5 6	7 8 9	1 2 3	4 5 6	7 8 9
2	Formulates a clinical diagnosis						
3	Substantiates a diagnosis using available clinical and investigative findings						
4	Offers a reasonable differential diagnosis						
5	Selects appropriate investigations						
6	Formulates a treatment plan						

Table 1: Assessment tool for summative assessment (Burch & Seggie, 2008)

In their study, Burch & Seggie (2008) provide evidence that portfolios of learning can successfully be adapted for use within the South African Higher Education context. In their



study, portfolios formed a central source of patient centered learning from which assessments were drawn.

A portfolio assessment of clinical reasoning using a structured interview (Burch & Seggie,2008) which offered a reliable, validated assessment system that was both affordable and feasible within the context.

## **2.5 Conclusion**

This chapter has provided an overview of the literature pertaining to the use of portfolios in health science education and the use of portfolios to assess clinical reasoning and learning using a structured interview. The following chapter explores the research methods used in this study.

## **Chapter 3 Research design and methodology**

### **3.1 Introduction**

This chapter serves to introduce the reader to the research design used in this study. The framework, design, instrumentation, sample, and analysis processes are discussed. Ethical issues are identified and limitations of the study explored.

### **3.2 Research framework**

Educational research aims to improve educational action through informed educational judgment (Bassegy, 2001). The epistemological underpinning of meaning is detectable in human experience, through research (Merriman, 2001; Miles & Huberman, 1994; Burns and Groves 2005 in Brink, 2007). This supports the framework for a qualitative approach and methodology in a small study. Qualitative studies offer a participant centered approach with high value being placed on authentic narrative data and the analysis thereof (Miles & Huberman, 1994).

### **3.3 Research Design**

The portfolio assessment system was designed for use in the URCS. IN line with educational research aiming to improve educational action through informed educational judgment (Bassegy, 2001), a qualitative case study design was adopted for this research. Moutton (2009) identifies case studies as being a method suitable for accessing in-depth insights in small groups and. Qualitative studies offer a participant cantered approach with high value being placed on authentic narrative data and the analysis thereof (Miles & Huberman, 1994). The epistemological underpinning of meaning is detectable in human experience, through research (Merriman, 2001; Miles & Huberman, 1994; Burns and Groves 2005 in Brink, 2007).

The experience of students and clinical educators was identified as being valuable in ensuring that the system met the academic needs of the students as well as informing improvements in the system for the following year. The study was longitudinal in nature, spanning an academic year from the planning and introduction of the portfolio assessment system at the beginning of 2011 to the end of the URCS placement prior to the final examinations at the end of 2011.

### **3.4 Research Design**

This study focuses on the experience of the small group of students and their clinical educators during the implementation of a portfolio assessment system within a new Rural Clinical School education platform. Given that the group of participants was small and the human experience provided data to illuminate the lessons learned, a qualitative interpretive design was selected (Miles & Huberman, 1994).

The study was longitudinal in nature, spanning an academic year from the planning and introduction of the portfolio assessment system at the beginning of 2011 to the end of the URCS placement prior to the final examinations at the end of 2011.

### **3.5 Research Instruments**

Miles and Huberman (1994) question the quality of targeted research questions, suggesting that an inherent bias is introduced into the relationship between researcher and interviewer. Britten (1995) describes the need for interviewers to “go below the surface” and stresses the need to clarify meaning during interviews. Questions included in qualitative questionnaires should be open ended, neutral, sensitive and clear to the interviewee if they are to direct enquiry into the experience, beliefs, opinions, knowledge, background and demographics (Paton, 1990).

This study aimed to explore the human experience of the portfolios as a learning and assessment system, with a view to not only documenting the experience, but also to inform decisions regarding adjustments to the portfolio assessment system for the 2011 students as well as in the planning for the 2012 URCS students. Semi-structured interviews were developed to contain the data collection and to ensure that pertinent information was collected within the limited time available (Miles & Huberman, 1994).

Semi-structured question guides were prepared (see Addenda A & B) for use in the focus group as well as for the interviews. A selection of questions was prepared to guide the focus groups and interviews. These questions were developed as a cooperative process between the curriculum designers, the research supervisors and the researcher in consultation with the current relevant literature focusing on indicators of problems experienced in other similar rural studies. In accordance with the original research design, questionnaires for the second round of semi-structured interviews were adapted to investigate gaps and key points emerging from the first round of interviews.

A cooperative enquiry group comprised of members from each discipline, the researcher and the two supervisors was planned. Meetings between the supervisors and researcher took

place in September, October and November 2010. This extended group was to have met in December 2010, March 2011, June 2011 and September 2011. However, this cooperative enquiry group only met twice as part of the staff development and training. Additional groups were not feasible as URCS clinical educators were unable to commit additional time to the project and distance proved to be an obstacle greater than anticipated in the planning of this research project.

### **3.6 Sample**

The whole group of final year MB ChB students placed in the URCS formed the student sample for this research in a bid to promote accuracy. The small numbers of this group made using the group in its entirety affordable and manageable.

Purposive sampling was applied in selecting the clinical educators as participants. The clinical educators were the only group of URC health professionals tasked with conducting both formative and summative assessment. Accordingly, they were identified as the group most likely to have experienced portfolio assessment system in its entirety. It is acknowledged that the exclusion of other health care professionals who may have worked with students during the development of portfolios and formative assessment thereof introduces bias. However, confining the sample to the clinical educators was seen to be affordable, manageable and in the best interest of accurate data pertaining to the portfolio assessment system as a whole.

The initial group of eight final year MB ChB students placed in the URCS as well as representative clinical educators from each discipline were invited to join the study. Eight clinical educators participated in the initial focus group interview for clinical educators and ten in the second round.

#### **Qualitative data sources**

Data was sourced from:      Student participants  
   Clinical educator participants  
   Documents reviewed

#### **Students (n=8).**

A semi-structured focus group was conducted in March 2011 which was attended by the entire group of students (n=8). This focus group was conducted by the researcher.

The second round of individual student interviews (n=8) were conducted by an independent University of Stellenbosch researcher in October 2011.

### **Clinical educators (n=10)**

Discipline specific interviews were conducted with clinical educators in May 2011. The first round of interviews was conducted by the researcher. The second round of discipline specific clinical educator group interviews was conducted by an independent university of Stellenbosch researcher in October 2011.

### **Document review**

Data gathered from the document review included notes taken during workshops conducted in December 2010, January 2011 and May 2011. Student guides specific to the 2011 URCS final year MB ChB students containing details of the portfolio system process were reviewed.

### **3.7 Data analysis**

Carney (1990) provides a ladder of analytical abstraction (Miles & Huberman, 1994). Progression from the first level of summarizing and coding the data is followed by analysis and identification of the relationships and gaps. The final level identifies relationships of data, integrating data with the research framework. This framework was used in sorting data. Raw data was gathered from the verbatim scripts and entered into an Atlas TI programme.

Data was further refined using frameworks suggested by Taylor-Powell and Renner (2003). Data from the two groups of participants was analysed and reduced. Participant anonymity was established by assigning numbers and the letter S to student participants and the letter P to clinical educators. Data was organized loosely into broad groups of similar topics. Meaning was attributed to the narrative text (Graneheim & Lundman, 2004). Clusters of information were labeled using assigned codes. A list of key findings was developed. These were supported by quotes. The results from the two sets of data analysis produced similar themes. Themes and findings were discussed with the second interviewer and supervisors.

Graphics were developed using Microsoft 2007 software.

### **3.8 Ethical considerations**

Ethical approval was granted from the University of Stellenbosch Health Research Ethics Committee. Participation was voluntary as supported by signed consent forms. Afrikaans and English were used in the interviews according to participant choice.

### **Confidentiality**

The aims, methods and steps to maintain confidentiality and privacy were explained to the participants as well as communications of the final findings. Participants were provided with detailed information regarding the purpose of the research and what steps would be taken to protect their right to confidentiality and to privacy. Students and staff were free to make their own decisions whether to participate; there was no coercion. Participants gave their written consent to participate in the study.

### **Interview guides**

Questionnaires and the plan for second round questionnaire development received ethical approval from the University of Stellenbosch ethics committee.

### **Audio taping and transcribing**

Participants were assigned a code to ensure anonymity outside of the interview process. Whilst participant identity on these transcriptions has been made anonymous by a system of codes, the context and small sample of this study may limit the efficacy of this and participants may be identified by peers within the URCS community of practice.

### **Data Collection**

All interviews were audio taped and data was accurately transcribed. The audio recordings were destroyed and transcribed interviews were stored on a secure electronic device.

## **3.9 Limitations of this study**

### **Distance**

The researcher had no professional links with the URCS. While this is a positive in terms of the research process, distance limited the frequency of contact with the participants.

### **Time**

Clinical educators are burdened by high patient loads and coordinating additional research contacts above those already discussed proved to be impractical.

### **Verifying findings with participants**

The researcher did not have access to participants outside of the scheduled workshop or interview. Verifying meaning with participants was thus limited.

### **Novice status of the researcher**

Moving from the confidently unaware to the introspective acute awareness of acknowledged limitations must impact on the research process (Miles & Huberman, 1994).

The following measures were adopted to compensate for this gap in experience:

- guidance from research supervisors was sought
- the literature was referred to
- consultation with the available community of experienced researchers and peers
- debate and consultation with peer Health Science Education Masters students

### **3.10 Conclusion**

This chapter has described the methodology used in this study. The sampling, instrumentation and collection of data and analysis process within the ethical boundaries has been described. Identified limitations have been discussed. The following chapter will discuss the findings.

## Chapter 4 Results

### 4.1 Introduction

This chapter will review the results extrapolated from the analysed data gathered during this study. Data was collected using a focus group and interviews.

### 4.2 Document review

A document review was conducted in order to establish the sequence of events in the development of the portfolio assessment system and to establish details of induction and assessor training which occurred outside of the focus group and individual interviews. The planned cooperative enquiry group proved to be impractical and the document review served to fill this void. Documents reviewed included notes taken from the URCS workshops in 2010 and 2011, as well as the 2011 URCS Student Study Guides (See Table 2). A lack of consistency in the development of portfolios was reported despite comprehensive instructions within student study guides. Notes from the workshops indicated that comprehensive information to develop teaching and assessment skills was provided (Burch & Conradie, 2010; URCS study guides, 2011). Each discipline participated in curriculum design by identifying a list of discipline specific common conditions to be used in the planning of portfolio (Notes from meeting, 2010). Summative assessment using the portfolios was a recognised challenge which was addressed at the May workshop and provided the opportunity for guidance and support for the development of assessor skills.

Document accessed	Portfolio assessment system information retrieved
University of Stellenbosch. 2011. <i>Phase IV: (Late) Clinical rotation.65730541/678. Introduction: Ukwanda Rural clinical School:2-4 Longitudinal integrated rotation.:6-11</i>	Review of URCS Student Study Guides 2011 Information for traditional and longitudinal placements provided Provides detailed information for compiling portfolios, learning outcomes, assessment criteria and the use of portfolios in assessment
Workshop 10 December 2010 Notes from meeting including a copy of power points Burch and Conradie 2010 (See addendum C)	Attended by clinical educators, specialists, other health care professionals and representatives of the University of Stellenbosch and URCS Recap of basic learning principles Learning opportunities within URCS Discipline and longitudinal based portfolio instructions introduced Incorporating reflective learning into portfolios Integration of list of common condition Presentation of portfolio assessment system rating scale
Student induction 8 January 2011 . Notes from meeting	Introduction of portfolio assessment system to students
Workshop 13 May 2011 Notes from meeting	Facilitated small group discussion identifying successes and challenges of the rural education platforms including the use of portfolios to date Demonstration of portfolio assessment and use of the rating tool

Table 2 .Tabulation of portfolio assessment system information gathered during document review



### 4.3 Overview of themes

Four themes were identified within the study. The first theme discusses infrastructure challenges which influenced the second theme, the learning experience. This is followed by the orientation to the portfolio assessment system, while the assessment experience is discussed last. Sub themes within each theme are expanded and an accompanying diagrammatic representation provided. The two participant cohorts in this study were interviewed independently and results have been discussed accordingly. Results from the document review have been included.

Students' comments have been included as "S" with the appropriate coded student number. Clinical educators' comments have similarly been coded and are represented by "P".

Direct English quotes from transcripts have been included as direct quotes within parenthesis. Where Afrikaans has been used as the language of choice by the participants, quotes have been included in Afrikaans and are followed by an English translation. In recognition of the tenuous success of direct translation to accurately represent concepts as presented by the participants (Larkin et al.2007. Squires, 2009), quotation marks have not been used for the translations. The quotes and translations have been included in italics.

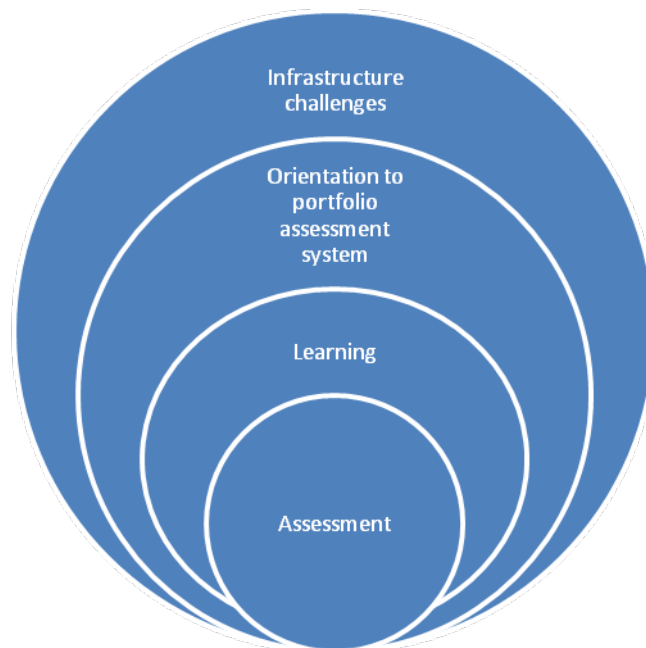


Figure 1: Representation of 4 identified themes within the URCS portfolio assessment system

#### 4.4 Infrastructure Challenges

A number of infrastructure challenges emerged. These are diagrammatically represented in Figure 2.

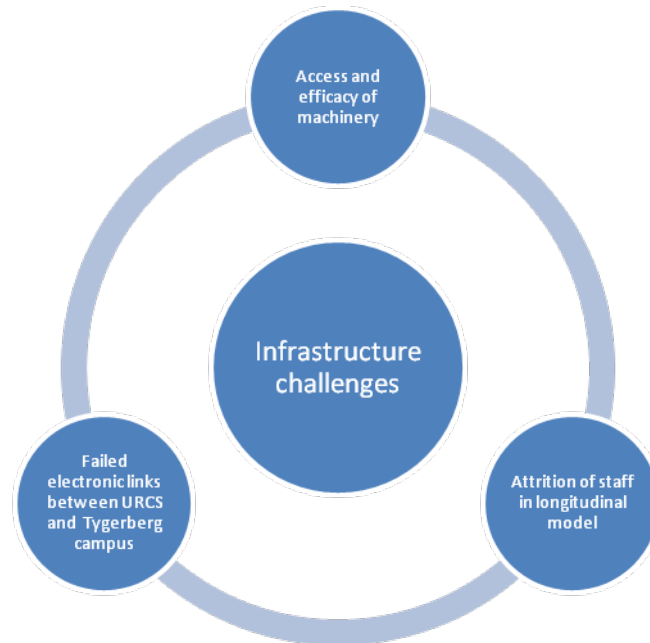


Figure 2: Theme representation: infrastructure challenges and 3 sub themes

##### 4.4.1 Access to and efficiency of machinery

The original instruction to students was to use carbon copy in order to document the notes made by them in the patients' folders. Students said this did not work and resorted to photocopying their patient notes. This was problematic as it was time consuming due to slow machines as well as to inadequate numbers of copiers available to students. This was seen as an administrative burden with no learning value (S2, S 6). In addition, the equipment was not available to students after hours. Some students who were accustomed to studying in study centers or libraries found it an adjustment to studying in more isolated environments.

One student took a pragmatic view of the challenges.

*"...things I think that we were used to at Tygerberg as students that we just took for granted, didn't happen here, simple things like photocopying, printing documents, having access to a computer room, but we did get laptops." (S4)*

Clinical educator did not comment directly on these challenges.

#### **4.4.2 Failed electronic link between URCS and Tygerberg Campus**

Electronic links, over and above the routine Web CT electronic platform, were planned to facilitate access to information and tutorials at the Tygerberg Campus. These should have given students access to tutorials held at Tygerberg Hospital. This electronic platform failed and was not in place by the time of the second interviews. This was seen to be a resource deficit by both students and clinical educators, particularly in the first interviews. Material placed on Web CT, however, was described as adequate during the second round of interviews. The anxiety surrounding the unavailable electronic links suggests that confidence in patient based learning and direct supervision from specialists in the preparation of portfolios was initially undervalued.

*“Hulle het nou mooi goed op Web CT gesit... enigiets wat hulle (Tygerberg students) op WebCT kan kry, kan ons ook op Web CT kry...” (S1)*

*They put nice stuff on Web CT...anything that they (Tygerberg students) can get we can also get ... (S1)*

#### **4.4.3 Attrition of staff in the longitudinal placement**

The District Hospital in Ceres underwent staff changes in the interim between having been identified as a suitable site in 2010 and at the start of the 2011 academic year when students were placed in the longitudinal rotation. These changes left the supervising family medicine specialists with a team divested of experienced clinical educators for providing academic support to the students. The tensions between clinical work and providing academic support thus became a challenge for this specialist.

#### **4.5 Orientation to portfolio assessment system**

Students were orientated to the portfolio assessment system at the start of the 2011 academic year. Clinical educators were introduced to the portfolio assessment system at workshops held in December 2010. Ongoing support was provided by the course coordinator. The five identified sub-themes are diagrammatically represented in Figure 3. There was no direct reference to orientation process from the clinical educators.

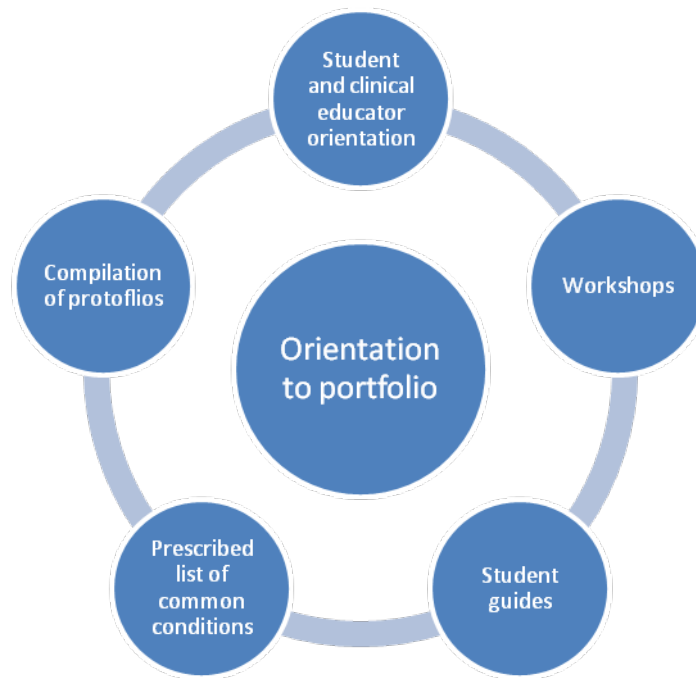


Figure 3: Theme representation: orientation to portfolio and 5 sub themes

#### 4.5.1 Student and clinical educator orientation

During the March interview, student confidence in the portfolio assessment system was guarded. Orientation to the system was seen to be lacking. Despite the instructions in the student guides, students seemed unsure about the exact procedures to follow. This uncertainty extended to concerns about the initial assessments where assessors, novices in this system, were also adjusting to the demands of the new system. By the time of the last interviews, student concerns regarding assessor skills appear to have abated and did not feature as a contentious point of discussion.

*... en ons is gebelowe 'n "writing up the portfolio the Stellenbosch way" en so iets het nooit afgekom nie. Ons het nooit training gekry nie en ek weet nie of die konsultante opgelei was om hoe die eksamens te doen nie of almal maar nou blindelings in die eksamen in gegaan het, om elkeen sy eie metode te ontwikkel om dit te doen." (S5)*

*...and we were promised a "writing up the portfolio the Stellenbosch way" but nothing came of it. We never got training and I don't know if the consultants were trained in doing exams or if everyone went into the exams blindly, working out their own method of doing it. (S5)*

#### 4.5.2 Workshops

Workshops convened in December 2010, January 2011 and May 2011 provided the opportunity for clinical educators to develop their skills and deepen their knowledge regarding the portfolio assessment system. Earlier workshops preceded the arrival of the students, but students were invited to the workshop in May 2011. While not all students were able to attend this workshop, the opportunity to participate and observe provided insight into the curriculum design.

*“Ek dink dit is baie goed om te weet dit is presies hoe hulle dit gaan evalueer. ... want baie keer voel dit vir my daar is goed waarin ons kurrikulum sit, waar niemand vir ons sê dit is hoekom jy dit doen nie.. Dit gee net 'n bietjie meer insig en dit help op pad vorentoe.” (S3)*

*I think it is very good to know exactly how they assess... because it often feels as though there are things in the curriculum, where nobody says this is why you are doing it. ..This gives a bit of insight and it helps with the way forward. (S3)*

However, not all participants found the workshop useful or identified the relevance thereof.

*“It was a good workshop, but I don't know if... it was specifically portfolio-based...wasn't very portfolio-based, for me, and I don't know how much of that information the consultants will actually use.” (S4)*

The portfolio workshops were seen to be valuable (P1, P2, P11, P12, P15, P16, S3, S6, S8). Clinical educators found the workshop opportunities to be valuable, with continuing clinical educators development considered to be necessary.

Two assessors from the University of Cape Town attended the May 2011 workshop and demonstrated the use of the assessment tools in a mock exam. Further development of facilitator and assessor skills was seen to be essential in the format of continued workshops.

*“ Hulle het sulke 'mock exams'gedoen. So dit was nogal goed. Ek dink ons het almal baie daaruit geleer, gesien hoe verskillende,.. want ons word nie eintlik opgelei om te eksamineer nie, en elkeen het maar sy eie styl.” (P1)*

*They did these mock exams, which was really good. I think we all learned a lot from it, seeing the differences. ... because we don't really get training on how to examine, and everyone just has their own style. (P1)*

While workshops were seen to be useful by some this was not true for all.

*“Nee, ek dink daardie werkswinkel was meer om te besluit hoe dit volgende jaar gaan gebeur.” (P8)*

*No, I think that workshop was more to decide how it will be done next year. (P8)*

#### **4.5.3 Student study guides**

Student study guides were prepared by the course designers. These included detailed instructions on how to meet the learning outcome, how to compile portfolios, and how these would be used for formative assessment and summative assessment.

Some students commented on the under-utilised value of the student guide, expressing the opinion that the student study guides were not widely used by the students or referred to by the clinical educators.

*“Ek dink die enigste keer wat ek dit gebruik het is om te kyk watter hoofstukke in die handboek moet ek benader. Jy sien die patologie, ’n mens kan dan seker redineer dan hierdie lysie se doel, maar ek voel net daardie is glad nog nie geïntegreer genoeg nie. Ek dink dit is ’n waardevolle tool wat hulle het, maar heeltemal onderbenut..” (S5)*

*I think the only time I used it was to see which chapters I must look at in the handbook (student study guide). You see the pathology, a person can argue the purpose of the list, but I just feel it wasn't integrated enough. I think it is a valuable tool, but totally under utilised. (S5)*

*“Toe het ek gesien, o, hulle verwys nou eintlik na dit toe, maar nooit rêrig dat ek fisies gesit het en op ’n slag gesit en tick het. “O, dit het ek, dit het ek”. Soos nou die dag toe ek deur my interne boekie blaai toe sien ek o, maar my wêreld, ek het meeste van die goed ... gesien hier in die hospitaal.” (S1)*

*Then I saw, oh, they are actually referring to this, but I never physically sat down and ticked them. “Oh, I have this, I have this”. Like the other day when I was looking through my intern book and I saw, oh my word, I have seen most of this stuff in the hospital. (S1)*

There were no direct references to the student study guides by clinical educators.

#### **4.5.4 Prescribed list of common conditions**

As part of the original curriculum design for the RCS, each discipline compiled a list of core common conditions appropriate for final year students to identify and manage, or, identify and refer. These learning outcomes were incorporated into the design of the portfolio assessment system.

Most students felt that they had covered the majority, if not all of these during the course of the year (S1; ST3; S5). This list was also seen to be useful in managing and planning studies to meet the expected learning outcomes of the portfolios. There was support that the list of common conditions was successfully incorporated into the design of the portfolio assessment system and that these were applicable in the clinical setting.

*“Ja, ek dink ek het ten minste 75% na 80% van dit gesien. Om die ander 15%, 20% te gaan swot, gaan nie 'n groot probleem wees nie. Die goed wat ek wel gesien het, het ek hands-on die pasiënte self ondersoek, . . . So, ek dink daardie vaslegging was awesome gewees.”(S2)*

*Yes, I think I have seen at least 75%-80% of this. To go and study (swot) the other 15, 20 % isn't going to be a big problem. The things I actually saw, I myself examined the patient hands on,... so I think that experience was awesome. (S2)*

Portfolios were helpful in directing teaching to meet the learning outcomes within both the tutorial and clinical setting (P15, P9, P8).

*“If they've done it properly, they will never forget issues” (P1)*

*“daardie 20 most likely symptoms or common symptoms that patients present with'. Dit bly vir my 'n baie essensiële ding om junior dokters op te lei...” (P5)*

*those 20 most likely symptoms or common symptoms that patients present with. For me it remains a very essential thing to use to educate junior doctors... (P5)*

#### **4.5.5 Compilation of portfolios**

Students described the compilation of the portfolios as burdensome and time consuming,.

*“Dis baie tydrowend gewees om eventually die finale produk van die portefeulje saam te stel. Maar die leer, die leer geleentheid en die leer wat jy kry uit die portefeulje is baie positief, en jy onthou baie goed wat jy geleer het by die pasiënte, en die evaluering per sê was lekker gewees, want jy kon so goed voorberei vir so ‘n eksamen. Maar net die administrasie rondom saamstel van die portefeulje was vreeslik tydrowend.” (S1)*

*It was very time consuming to eventually put together the final portfolio. But the learning, the learning opportunity and the learning that you get out of the portfolio is very positive, and you remember very well what you’ve learned from the patients, and the assessment as such was enjoyable because you could really prepare well for this type of examination. But the administration around putting the portfolio together, was terribly time consuming. (S1)*

Despite the portfolios being time consuming, students verbalized that the portfolio compilation was a positive learning experience later in the year.

*“The write up of the portfolio makes me think critically. Every Friday I discuss my portfolio with my consultant and he asks me why I have requested certain bloods and why I have decided to write up treatment. It makes me think What have I done? What should I have done?” (S5)*

Clinical educators identified the portfolio assessment system to be a valuable in the preparation for the final end of year assessment and not only for the portfolio summative assessment (P13). Students who spent time with their patients and researched their identified learning gaps were seen to achieve better in the portfolio assessments than those students who did less. Compiling portfolios was seen to be an opportunity for students to create a comprehensive document which could be used in preparation for other assessments.

*“Ek soek ‘hypertensive treatment’, hierso is die ‘guidelines’. Gee dit vir hulle, sit dit net in, in jou portefeulje, of jy ‘reference’ dit net, dat as jy weer deur die pakkie deurgaen, dan weet jy waar om net dit in te kleur met die regte inligting wat toepaslik is vir ons as huisdokter of as ‘n junior dokter.” (P1)*

*I am looking for hypertension treatment, here are the guidelines. Give it to them, just put it in, in your portfolio, or just reference it, so that when you go through your pack (of notes)*



again, then you know where to fill in with the correct information which is appropriate for an intern or a junior doctor. (P1)

## 4.6 Learning



Figure 4: Theme representation: orientation to learning and 5 sub themes.

The learning subthemes identified have been discussed individually.

### 4.6.1 Tutorials

The portfolio assessment system cannot be seen in isolation from the URCS academic programme which served to support student learning. A formal academic teaching day was convened mid week and tutorials were also integrated into ward teaching.

Students valued tutorials as a learning experience (S1, S4, S5, S6, S8) expressing that this both encouraged independent learning as well as development of portfolio cases. Additional reading appears to have been a norm (S4, S8). Due to the rotational nature of the placements, tutorials did not match the academic programme which some students found unsettling (S2, S3). One student expressed dissatisfaction with the academic programme. Two students did not enjoy the approach of the portfolio assessment system.

*“As ’n evaluasie doel, dink ek nie dis ’n baie goeie ding nie. Ek kan sien hoe ander mense kan dink dit is, maar ek persoonlik voel dit is baie werk, verskriklik baie werk, en dit vat baie van jou tyd op om dit te doen.”(S2)*

*As an evaluation (assessment) tool, I don't think it is a very good thing. I can see how other people can think it is, but I personally feel it is lots of work, an enormous amount of work, and it takes up a lot of one's time to do it. (S2)*

The tutorial structure was perceived to be different from that of Tygerberg. The structure was seen to be supportive of learning and portfolio case development.

*"We had a lot of sessions with consultants, where we'd actually sit down and discuss portfolio cases, which were very important. A lot of patient-centred discussions, so it wasn't just like at Tygerberg where we discuss a topic, which makes no sense if you don't have a patient to have it based on. Interactions with students were viewed as positive experiences". (S4)*

Some disciplines offered time within tutorials for portfolio discussion during formal weekly tutorials where the portfolio case discussions guided students towards independent learning. Interactions with students were viewed as positive experiences by clinical educators. The students' engagement with current literature prompted other clinical educators to further their own reading and knowledge base. While Evidence Based Medicine seems to be strongly supported by the students, one specialist was stimulated to verify the information.

*"Ek meen kyk, ons was nou 'n redelike ruk lank terug in daardie akademiese opset, en dinge het begin verander. So dan die studente sal partykeer iets kwytraak wat jy dink maar yoh, waar kom dit vandaan, en as jy dan vir hulle'n bietjie uitvra, dan kom jy agter o, okay, maar dalk was daar al ietsie, in die tussentyd, navorsing wat gedoen is op 'n sekere ding wat jy nie van bewus was nie. So hier en daar het dit gebeur dat ek dit gaan kyk het en na hulle toe teruggekom het en gesê nee wat ouens, julle is op die verkeerde pad, of wow, ja, wel, jy's reg"(P15)*

*I mean, it's been a while since we were in that academic set up, and things have started to change. So then the students will sometimes say something that makes you think yoh! Where does that come from, and then if you ask them about it you realise oh okay, maybe, in the meantime, perhaps some research was done on something that you didn't know about. So, now and again, it happened that I went to have a look and came back to them and said, no guys, you are on the wrong path or wow, you were right after all. (P15)*

#### 4.6.2 Evidence Based Medicine

Evidence Based Medicine is an approach integrating evidence from scientific studies into clinical practice and one which was encouraged.

Evidence Based Medicine was identified as being a desirable approach to validating treatment decisions. Consulting journals, latest research and current national guidelines was a new learning pattern for many of the students. The compilation of portfolio patient studies was seen to be the catalyst for this change.

Evidence Based Medicine was supported in some disciplines by providing students with the appropriate guidelines. Clinical educators identified that having the final year students as part of the team stimulated further learning and reading by other clinical educators.

#### 4.6.3 Independent learning

The learning emphasis of the portfolio assessment system is in promoting autonomous goal directed adult learning (Knowles in Quinn, 2007). Independent learning was seen to be supported by the compilation of patient studies for portfolios (S8, S1, S2, S4).

*“So as ek iets swot, dan sien ek o, dit was daardie pasiënt wat ek gesien het, en dit was wat die pasiënt gehad het. Omdat ek so baie blootstelling het aan verskeie ongedifferensieerde pasiënte kan ek heelyd dink dis wat daardie een gehad het.” (S1)*

*So when I swot, then I think Oh, this was that patient I saw and this is what this patient had. Because I have had so much exposure to different undifferentiated patients I can always think this is what that one had. (S1)*

The balance between autonomy in the preparation of portfolios and supervision of student progress was seen to be a delicate balance. While some clinical educators saw regular supervision as being integral to the development of patient studies for portfolios, others were hesitant to “spoon feed” students.

Clinical educators linked the quality of the portfolio case studies to student motivation .

*“So the degree of learning that one had was a function of the participation.”(P1)*

*“Nou, die ding is, die kwaliteit van daardie portefeulje het verskil van student tot student. Amper op die ou end, ek weet dit gaan nie daaroor, dat 'n mens die kwaliteit van die*

*portefeulje wat hy saamgestel het moet evalueer nie, maar 'n ou kan tog ook nou nie halwe werk doen nie.”(P8)*

*The quality of that portfolio differed from student to student. At the end of it, I know it isn't really about the assessment of the quality of the the portfolio, but a chap can't do a half-baked job. (P8)*

#### **4.6.4 Supervision of learning**

Supervision of students in the clinical setting extended to a wider group than the clinical educators who participated in this study. Other specialists, registrars, medical officers, professional nurses and allied health professionals contributed to student teaching and skills development.

There is evidence that most students became self motivated independent learners through the supervision process, even where supervision was reported to be inadequate. Identifying learning gaps during clinical work prompted reading and investigation of current management trends.

*“Die feit dat jy deel is van besluitneming rondom jou pasiënt, en jy is verantwoordelik vir die sorg van jou pasiënt, het jou stimuleer om baie literatuur soektogte te doen en kyk wat is die nuutste en beste behandeling vir die spesifieke probleem van die pasiënt.”(S1)*

*The fact that you are part of the decision making for your patient and that you are responsible for the patient's care, really stimulated lots of literature searches to see what is the newest and best treatment for the specific problems of the patient. (S1)*

Supervision from specialists was valued. Most Worcester (traditional rotation) students expressed satisfaction with the level of supervision provided by clinical educators. However, the 2 longitudinal students expressed dissatisfaction with the academic system and felt unsupported in their learning and the development of their portfolios.

*Daar's nie rêrig enigiemand nie. Daar's niemand wat oor jou skouer gaan kyk en vir jou sê nou moet jy dit doen of nou moet jy dat doen. Ek dink self die studente op Worcester word baie ge-spoonfeed. Hulle kry meer tutoriale as ons. Hulle is nog half in die nassie in, waar ons moet flap of ons val op die grond [lag].”(S2)*

*There isn't really anybody. There is no one who will look over your shoulder and say now you must do this or you must do that. I think that even the students in Worcester are very spoonfed. They get more tutorials than us. They are still half in the nest, whereas we have to flap our wings or fall to the ground (S2)*

### **Supervision of learning by specialists in Worcester**

While acknowledging that teaching is time consuming, specialists supervising found the teaching burden within the Worcester environment manageable.

### **Supervision of learning in the longitudinal rotation**

Specialist access to the longitudinal students was identified as being problematic.. Specialists acknowledged that outreach from Worcester to the Longitudinal students was problematic. The gaps identified were in part addressed by curriculum changes to ensure that students were provided with adequate learning opportunity in specialist disciplines such as surgery. Portfolio cases were further developed during specialist outreach visits. While specialists facilitated the development of the longitudinal students' portfolios, it was also seen to be beneficial to the patients who would not otherwise have received intensive specialist input (P10). In addition, gaps in clinical practice were highlighted which prompted specialist outreach interventions P(9).

#### **4.6.5 Patient based learning**

The use of real patients rather than simulated paper cases is advantageous in the teaching of clinical reasoning (Kassier, 2010). Patient studies formed the core of the portfolio assessment system. Students linked the development of patient studies and personalised learning goals with the development of their own clinical reasoning.

*"...ons weet hoe om simptome te benader... Dis nog waaroor dit gaan, die pasiënt lê daar met 'n probleem, 'n simptom, en dan moet jy van daar af dink."(S1)*

*...we know how to manage symptoms. That is really what it is all about. The patient is lying there with a problem, a symptom, and then you have to work it out from there. (S1)*

*"Dit maak vir my baie meer sin om in jou finale jaar eerder te leer om 'n pasiënt van scratch af holisties te kan hanteer as om 'n klaaruitgewerkte verwysde pasiënt in 'n kliniek te sien in Tygerberg. Jy het absoluut geen stimulasie om te dink nie want jy het klaar die diagnose..... So ek dink die hele integrasie rondom jou finale jaar, dis definitief beter" (S2)*

*It makes more sense to me to learn how to manage a patient holistically from scratch rather than to see a Tygerberg patient who has already been worked up. You have absolutely no stimulation to think because you already have a diagnosis. ...So I think the whole integration around your final year is definitely better. (S2)*

*"...die ander ding wat hulle vir ons die jaar baie klem opgelê het is clinical reasoning. As jy iets doen, hoekom doen jy dit. Kan jy dit motiveer?"(S2)*

*the other thing they have emphasised this year is clinical reasoning. If you do something, why do you do it? Can you motivate this? (S2)*

*"Now I actually would tie it (learning) up to a patient, which I've never done before. I've always just studied topics, because I've had a list of spots and that's it. But now I remember better, because I've actually seen a patient with such a condition. So now say I'm studying cardiac failure. I'd remember Mrs. X and I'd always remember it, because I'd know exactly, because I was part of her management. I'd know exactly what we did when, which medication to add, how Allied Workers helped us, simple things."(S4)*

Portfolios provided evidence of student engagement with their patients as well as a meaningful learning experience (P10, P11). The portfolio assessment system was supported as an assessment of clinical reasoning.

*"If they'd done it properly (development of portfolio), then at the end they had a good idea as to what was going on with their patients."(P11)*

*"... hoe meer hulle betrokke is, hoe meer is hulle kennis vermeerder ook. So ek dink dit is 'n goeie onderrig metode, veral die dat hulle geforseer word om volledig deur die pasiënt te dink." (P2)*

*...the more involved they are, the more their knowledge is developed as well. So I think it is a good teaching method, especially because it forces them to think thoroughly about their patient. (P2)*

#### **4.6.6 The impact of clinical work on learning**

The introduction of full time students to the URCS brought additional hands into a work place unaccustomed to the management of full time final year MB ChB students. Time spent in the clinical setting was at times at the cost of the students' opportunity for study and academic work. Guidelines regarding the hours students should be working with dedicated time for studying were not clearly set out at the start of the programme and was also not represented in the student study guides.

Students found the demands of the URCS clinical work an adjustment and identified that they were spending more time in the clinical environment than their peers at Tygerberg (S1) While this clinical exposure was seen as a benefit, even if a tiring one, students felt that time for studying was compromised (S6;S2, S3;S5, S8).

*"We're actually tired when we get home, and there's a lot expected from us because we're the only students and we're these doctor's first students, and they just expect us all to do well. So, time is a big issue for me in terms of studying."(S4)*

Clinical educators did not uniformly express concerns regarding clinical hours for students. The challenge of a balanced student work experience was identified in the longitudinal placements.

*"Again, the Ceres (longitudinal) folk get very, very easily just caught up in the business of being another pair of hands, and I think that needs to be very carefully looked at with regard to them."(P11)*

#### **4.7 Assessment**

Clinical educators were assigned responsibility for assessment by the University of Stellenbosch. Formal education training is not a prerequisite, which is identified as a norm within South Africa (Burch, 2007) and clinical educator experience and formal training varied. Five sub-themes emerged which have been represented diagrammatically in Figure 5.



Figure 5: Theme representation: orientation to assessment and 5 sub themes

#### 4.7.1 Formative assessment

Formative assessment was not well represented in discussions. The portfolio assessment design integrated formative assessment into the development of the patient studies forming the portfolio as an integrated learning opportunity. Documentation of the formative assessment process was not formalised and occurred as verbal feedback during contact sessions between students and clinical educators and neither group were instructed to maintain records of these interactions. The perceived divide between learning and assessment is reflected in the following student comment:

*“ as ek in die hoof van dinge gestaan het sou ek dit ... as 'n teaching tool eerder as 'n evaluasie tool” (S2)*

*if I was the head of things I would use it...as a teaching tool rather than an evaluation tool” (S2)*

Formative assessment was however formalised for the longitudinal students. Both longitudinal students were reserved in their support of the formative assessment. This is linked to a negative interpersonal experience with the assessors rather than a reflection of the formative process as such. Assessor preparedness for longitudinal students in these scenarios is questionable.



*“ Ons het nou half mock evaluasies gehad en ek het ... ingestap en die spesialis het my so gekyk en gesê ek ken nie jou gesig nie, was jy ooit op die rotasie ....Dis moeilik om dan vir iemand te verduidelik nee, jy was nie op die rotasie gewees nie [lag], jy het nie 'n rotasie gedoen nie, en mens sou half verwag dat hulle half clued up sou gewees het, tot hier kom landelike studente ook in vandag, so jy moet dit half verwag.”(S2)*

*We now had these half mock exams and I ...walked in and the specialist looked at me so and said I don't know your face, were you ever on the rotation...It is then difficult to explain to someone that ,no, you were not on the rotation, you didn't do a rotations...and a person half expects that they would be half clued up that a rural student was coming today, so you must half expect it. (S2)*

*“Die mense wat in Worcester (traditional rotation) is se hele thought process is in tune met die konsultant s'n want die konsultant hanteer die pasiënt. So daardie pasiënt is presies hanteer soos die konsultant wil hê hy moet hanteer wees, maar ons (longitudinal) pasiënte nie . Ek sal 'n pasiënt hê, dan sal hulle sê maar hoekom het jy nie dit gedoen nie, hoekom het jy nie dat gedoen nie. Eerstens, dis nie ek wat dit nie gedoen het nie, dis die dokters.Ek meen dan lyk jy soos 'n idioot, maar dis nie jy gewees nie, en jy sou nie soos 'n idioot gelyk het as jy in Worcester was en presies gewees het wat die spesialis wou gehad het nie. So in daardie opsig dink ek dit is vir my nogal 'n slegte gedeelte gewees. (S2)*

*The people working in Worcester (traditional rotation) have their whole thought processes in tune with the consultants because the consultants manage the patients. So that patient is managed exactly as the consultants want them managed, but our (longitudinal) patients are not. I will have a patient, then they say why haven't you done this or why haven't you done that. First, it isn't me who hasn't done things it is the doctor. I mean then you look like an idiot, but it wasn't you, and you wouldn't look like an idiot if you were in Worcester and knew exactly what the specialist wanted. In that respect I think that this was a bad part for me. (S2)*

#### **4.7.2 Summative assessment**

Within the portfolio assessment system designed for the URCS, formative assessment provided students with feedback in the preparation of patient studies and personalized learning goals. This was not credit bearing. Summative assessment took place at the end of the clinical rotations for traditional placements and at the end of the year for longitudinal

placement students. Patient studies prepared for the portfolios were used in the summative assessment. Summative assessment was credit bearing.

While students acknowledged the disparity between assessors, this did not seem to be a cause of great concern. Students showed tolerance of the need for assessors to familiarise themselves with the assessment system. Anxieties regarding assessor skills were seldom referred to in the second round of interviews. Confidence in the system improved over time as shown by the shift in attitude by this student.

*“I don't know if any of the consultants were trained on how to do the exams, or if everyone just blindly went into the exams and everyone just did their own thing and developed their own methods to do it.” (S1; March 2011)*

*“Ek voel ons het 'n goeie deurlopende assessering,.. My groot droom sal wees dat assesserings hier moet plaasvind by Worcester Hospitaal,.. Ons konsultante in samewerking met 'n konsultant in Tygerberg sal vir my ideaal wees.” (S1, November 2011)*

*I feel that we had a good continual assessment...My big dream would be to have assessments happening here at Worcestre Hospital... Our consultants working together with the consultants from Tygerberg would be my ideal .” (S1, November 2011)*

Clinical educators were required to manage a new assessment system which had been developed for the URCS. Initially, clinical educators focussed on the development of the patient studies for the portfolio rather than on the assessment outcomes (P9, P12, P13).

*“...ek het nou in die portefeuljes beplanning wat Dr Burch dit aan die spesialiste verduidelik, ek het al daardie goeters gehoor... Eintlik op die ou end, die belangrikste vir my is jy moet gaan kyk hoe gaan dit geëksamineer word, en op daardie manier moet jy die student dalk help.”(P12)*

*I was in the portfolio planning workshop where Dr Burch explained the portfolios to the specialists. I heard all that stuff. Eventually at the end of the day, the most important thing for me is that you need to know how it is going to be examined, and then perhaps help the students along those lines.(P12).*

*“Aanvanklik het ek nie baie aandag gegee aan die skep van die portefeulje en hoe dit as ‘n evaluerings ‘tool’ gebruik gaan word nie. Ons het gekyk na die leergeleentheid van die portefeulje in die eerste drie kandidate, toe besef ek maar in die eksamen is daar baie meer wat hulle eintlik kan doen daarmee.”(P13)*

*Initially I didn't give much attention to the development of the portfolios and how portfolios would be used as an evaluation tool. We looked at the learning outcomes of the portfolios in the first three candidates, then in the examination I realized there is really more, so much more that they can actually do with it. (P13)*

*"Ek dink so, want ek meen dis 'n nuwe, vir ons is dit 'n nuwe assesseringsmetode wat ons aangeleer het. Ek meen vir my, dis eintlik 'n hele nuwe konsep assessering van student... Dalk was dit vir my dan makliker om te leer om die portefeulje ding te doen [lag] omdat dit die eerste keer dan nou was.”(P8)*

*I think so, what I mean is it is a new, for us a new assessment method that has been taught to us. I mean for me, it's actually a whole new concept in assessment for the students. Maybe it was easier for me to learn to do the portfolio thing [laughs] because it was my first time. (P8)*

#### **4.7.3 Assessor skills**

The level of assessor experience amongst the clinical educators varied. While students acknowledged the disparity between assessors, this did not seem to be a cause of great concern. Students showed tolerance of the need for assessors to familiarise themselves with the assessment system. Anxieties regarding assessor skills were seldom referred to in the second round of interviews.

*“...I think it's something that the examiners are still learning and we're still learning...”(S8)*

The levels of assessor confidence varied widely amongst the clinical educators.

*“...vir my, dis eintlik 'n hele nuwe konsep assessering van studente, want ek het dit nog nie voorheen gedoen nie....”(P8)*

*„ for me, assessing students is a new concept, because I have never done it before...”(P8)*

Confining the assessment process to assessment and avoiding remedial teaching in assessment was seen to be a challenge.

*“Ek dink een van die belangrike vrae wat uitgekóm het vir my is moet ons dit nog steeds sien as ‘n leer proses, of moet ons hulle net eksamineer en niks sê of niks terugvoer gee nie...Dis iets wat ek nog steeds nie oor duidelik is nie.”(P1)*

*I think one of the important questions that has emerged for me is if we must still see it as a learning process, or must we just examine them and say nothing ; not give any feedback...This is something that still isn't clear to me. (P1)*

#### **4.7.4 Supervision of assessor skills**

Clinical educators identified the presence of the URCS coordinator as an additional assessor was seen to be valuable in the development of assessor skills (P8, P12, P13).

*“Ek was toe eers bietjie skepties daaroor want ek het vir hulle gesê wel, so waaroor gesels julle nou in die portefeulje evaluasie as hierdie pasiënt al klaar deurgewerk en deurgedink is. Toe ek nou op die ou end saam met Hoffie in die evaluasies was, mens het besef dat ja, ek meen al is die pasiënt goed bekend by almal, is daar nog steeds ‘n evaluasie geleentheid daarso.” (P8)*

*At first I was a bit sceptical about it because I said to them well, so what do you talk about in the portoflio exam if this patient has already been worked up and thought through. When I landed up together with Hoffie in the evaluation (assessment), a person realised that yes, I mean even if the patient is well known by everyone, there is still an (assessment) opportunity. (P8)*

#### **4.7.5 Standardisation**

Inconsistency in approaches between various disciplines to both the formative development of portfolios and the summative assessment was identified.

Students noted inconsistencies between approaches to the assessment taken by assessors. This further varied between disciplines which suggests flaws in reliability hampering the quality of the assessment,

*“ I think that's the thing, that the consultants weren't very clued up either on how they should structure the questions.”(S4)*

Guidance and support varied between clinical educators. Some clinical educators gave students the opportunity of a “mock exam” before the end of the rotation; others were seen to be hesitant and unsure of their role in the formative phases, Deviations from the planned design included document reviews of portfolios prior to the portfolio assessment and extensions of assessment time from the planned 20 minutes.

#### 4.8 Overarching themes

The role of the portfolio assessment system in this specific learning environment carried worth wider than that of the learning and assessment.

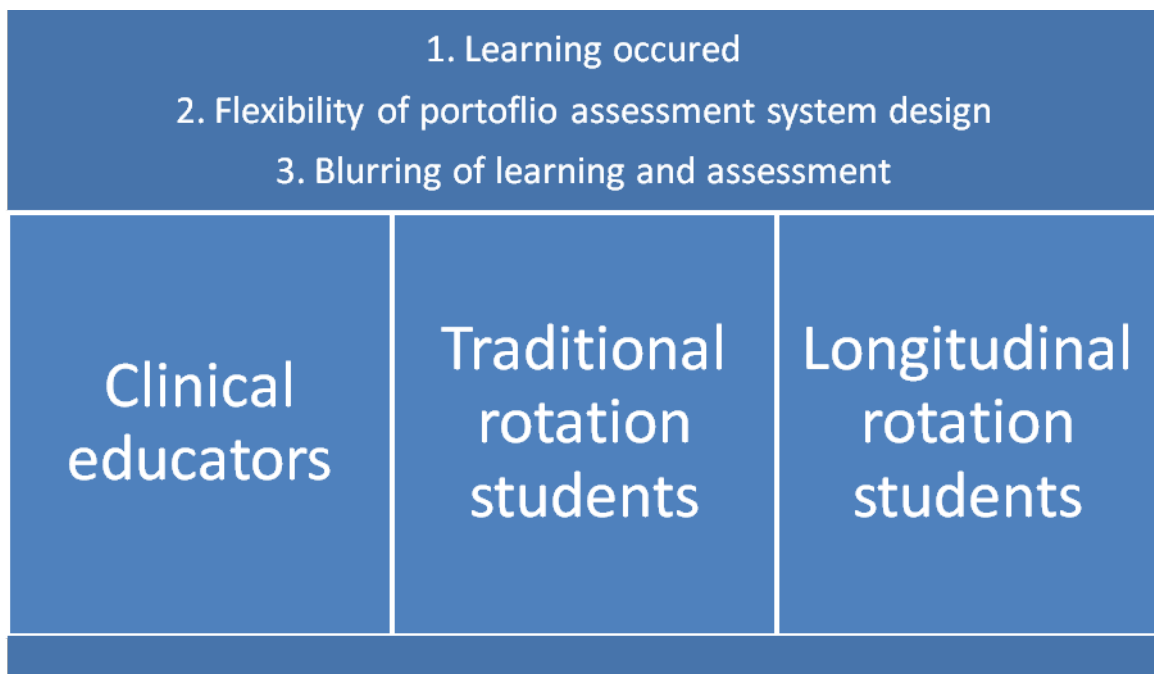


Figure 6 Overarching themes

#### Learning

Learning occurred within the portfolio system. Both clinical educators and students recognised learning as integral to the portfolio assessment system. Students reported confidence in their learning to be able to apply their learning in clinical reasoning. Some clinical educators identified their own learning resulting from their interactions with the portfolio assessment system.

Mutual positive regard between students and clinical educators emerged which supported the development of patient based learning and identification of personal learning goals within the portfolio assessment system.

### **Flexible design**

The portfolio design was flexible rather than rigid, allowing adjustments to be made by the design team to meet the needs of students and clinical educators. However, the flexibility also resulted in some adaptations to the design which in turn became challenges. Some of these challenges are linked to the under utilisation of the URCS study guides. While the study guides provided detailed procedures for portfolio compilation, these procedures were at times adjusted by both clinical educators and students independently of design team consultation.

### **Blurring of learning and formative assessment**

The design aimed to integrate formative learning to promote learning as an integrated part of the portfolio development. The confidence in learning supports that this occurred. However, this blurring has limited the awareness of clinical educators and students of formative assessment as an independent part of the portfolio assessment system. Further confusion has been noted regarding the use of “evaluation” where “assessment” is intended.

## **4.9 Conclusion**

The portfolio assessment system designed for the URCS final year MB, ChB students was implemented in one academic year. The experiences of students and staff highlighted 6 themes. The sub themes varied according to the placement of the participant as clinical educator, traditional rotation or longitudinal rotation student. Identified themes include infrastructure challenges, orientation to the portfolio assessment system, learning and assessment. Overarching themes identified were that learning occurred, the portfolio assessment system design had an inherent flexibility which had both positive and negative outcomes, and the distinctions between learning and formative assessment were blurred.

Results will be explored and discussed in Chapter 5.

## Chapter 5 Discussion of results

### 5.1 Introduction

This study sought to identify what lessons can be learned from the implementation of a portfolio assessment system, developed for a rural clinical school in South Africa, using data collected over time in a single academic year. In this chapter, the relevance of the findings will be discussed by exploring evidence found within the relevant literature. Discussion will be grouped into the identified themes of infrastructure, orientation to the portfolio assessment system, learning and assessment. Lessons learned during the implementation of the been summarized in Table 3.

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|---|
| <ol style="list-style-type: none"> <li>1. All challenges in a new portfolio assessment system cannot be anticipated and planned.</li> <li>2. An inherent flexibility and regular review in the design supports change.</li> <li>3. Changing pre-course decisions can impact on existing resources within a rural clinical school.</li> <li>4. Face to face teaching and supervision is valuable in the preparation of students for portfolio assessment.</li> <li>5. Ongoing supervision and development of skills was valued.</li> <li>6. Ongoing staff development promotes standardising assessment approaches.</li> <li>7. Workshops facilitated by a subject specialist were identified as being a time efficient and useful approach to supervision.</li> <li>8. Study guides provide valuable if underutilised information for both students and clinical educators.</li> <li>9. A framework for learning outcomes was provided by the list of twenty common conditions provided a feasible.</li> <li>10. The portfolio assessment system promoted student confidence in learning.</li> <li>11. Students need to have enough time for academic work. This can be difficult where students are placed in busy, understaffed settings</li> <li>12. Formative assessment design worked within the context of a small student group.</li> <li>13. Confidence in the summative assessment grew over the year,</li> <li>14. The portfolio assessment system requires further refinement</li> </ol> |
|---|

Table 3. Summary of Lesson learned.

### 5.2 Infrastructure

Before the start of the 2011 academic year, the portfolio assessment system had been planned and adequate infrastructure was anticipated to be in place. This study highlighted three core sub-themes, namely the access and efficiency of machinery, attrition of staff in the longitudinal model and failed electronic links to the Tygerberg campus.

#### 5.2.1 Access and efficiency of machinery

While the original design instructed students to hand write their portfolios and patient information, photocopying of documents became a norm. The availability and speed of copiers was an identified problem by students. Clinical educators did not comment on electronic or hand written portfolios and the production of portfolios does not appear to have been problematic in the assessment process.

This deviation from the original design does highlight the importance of careful planning to ensure that sufficient efficient equipment is available to support procedures. This is of particular importance in new rural clinical schools where equipment may not be sufficient to meet the demands of a new student population. Availability of machinery may also be linked to routine office hours when students are occupied with clinical activities. If possible, allowing students access to machinery after hours would be helpful.

### **5.2.2 Staff attrition**

The planned longitudinal placements were negatively affected by staff attrition following a change in staffing. Longitudinal students expressed dissatisfaction with the academic support available to them in the early part of the year and a formative portfolio assessment which took place in the first semester identified deficits in the system. Following this formative assessment, consultant support for the longitudinal students was increased and students attended Worcester Hospital for surgical experience which they were not gaining in the District Hospital. The review process built into the assessment design allowed for the identification of deficits and corrective action to address these deficits.

Medical educational specialists are limited within the South African context which impacts on establishing rural education platforms (Burch, 2007). Understanding factors which influence staff attrition can assist with addressing this problem (Ries et al., 2012. Glisson & Durrick, 1998). This is of specific importance in developing countries where resources (human, financial and infrastructure) are limited (Mullan et al., 2011).

### **5.2.3 The electronic teaching platform**

Accessing information was seen to be important for the development of portfolios. During the initial interviews, students were concerned that the absence of anticipated links with Tygerberg tutorials and ward rounds would disadvantage them. This anxiety abated during the course of the year, as confidence in the value of the portfolio in promoting learning grew. Web CT was identified as being a valuable electronic link by the students. Clinical educators also identified the need for improved electronic links with the Tygerberg campus specialist



departments. This would have promoted easier access to teaching material developed by the clinical educators on main campus.

Access to information is identified as one of the recognised challenges in sustaining academic standards in the developing world (Lansang & Dennis, 2004). Internet connectivity is quoted as being unreliable in Sub-Saharan Africa (Crow et al. 2012), with rural electrical supply seen to be less reliable than urban supply (Sokona et al., 2012). This may limit success in education platforms affected by power supply disruptions or limitations on interconnectivity or compatibility. Indirectly, this study highlights some of the challenges the University of Stellenbosch experienced in attempting to implement sophisticated electronic links beyond that of the regular service.

Online learning does however have inherent challenges and cannot be assumed to provide a didactic package which meets all needs all of the time (Dyrbye et al., 2009). It appeared initially that electronic resources were valued above the pedagogical interactions between clinical educators and students. Over time, the value of these interactions grew suggesting that a significant role for face to face teaching remains. Accordingly, the need for proficient health science educators in the clinical setting is indicated.

As learning and formative assessment are closely aligned in the design of the portfolio assessment system, access to information forms an integral part of formative development. However, limited access to Stellenbosch University electronic teaching sites was not reported to have impeded learning or performance in the portfolio assessments.

### **5.3.1 Orientation to the portfolio system**

Formal orientation should precede the implementation of new didactic approaches. The orientation process identified by the cohorts of this study is not definitive and the orientation process was difficult to track outside of the workshops. This could be a reflection of inadequate probing during the interviews. However, emergent inconsistencies in the compilation of portfolios nor the portfolio assessments suggest that a coherent message was not received or integrated into practice. This supports the standpoint that clinical educator competence in the delivery of teaching and in the use of both teaching and assessment tools is central to the success of a programme (Hesketh et al., 2001. Nestel & Tierney, 2007).

### **5.3.2 Workshops**

Workshops provided a time efficient training approach in which delegates were offered the opportunity to develop assessment skills, compare experiences, identify challenge and work towards finding solutions applicable to their own circumstances within the context of the portfolio assessment system. Pedagogic skills need to be developed if the staff is to be confident and proficient in the delivery of medical programmes, especially new ones (Lynch, 2001. Ogrinc et al., 2003. Stark & Fortune, 2003). Students attended the May workshop which provided them with the opportunity of developing their understanding of the assessment system and providing “bottom up” feedback.

### **5.3.3 Student study guides**

While the study guides provided detailed instructions for procedures to be followed in the portfolio assessment system, these do not seem to have been a well utilised resource by either students or clinical educators. This raises questions regarding the value placed on these documents and their utilisation by both clinical educators and students to guide the portfolio process.

### **5.3.4 Common conditions**

Within the design of the portfolios, a list of twenty common conditions aligned to the Stellenbosch University curriculum, formed a core of “need to know” conditions (Satterfield et al., 2010). These guided patient management decisions on a “know how to treat” or “recognise and refer” basis at a student intern level. In addition, the core outcomes were seen to be useful by students and clinical educators in guiding teaching, learning and assessment for the portfolio assessment. This framework of core learning outcomes was also seen to be valuable in preparation for the high stakes end of year final examination.

### **5.3.5 Compilation of portfolios**

In the original design of the portfolios, the use of carbon copies of hand written patient notes was planned to provide authentic evidence of the student-patient interactions (Burch & Seggie, 2008). The move away from carbon copy to an apparent quick fix electronic reproduction of notes and other documents may have saved students time, but this increased the administrative burden of portfolios and did not bring any recognised learning value. The loss of authenticity was not commented on by staff, suggesting that the value of the original design objective was not recognised. Once again the orientation of clinical educators to the portfolio assessment system and ongoing support and development of skills

is highlighted as an area requiring ongoing development and discourse with assessment designers.

#### **5.4.1 Learning within the portfolio assessment system**

Strong support emerged for portfolios as a tool promoting confidence in learning. This is in line with the literature which identifies portfolios as offering a versatile assessment approach, applicable in a wide variety of practice-based learning, which foster independent learning (Davis et al., 2001. Epstein, 2007. Burch & Seggie, 2008. Moores & Parks, 2010). The findings from this study support portfolios as promoting student learning for formative and summative assessment within the Rural Clinical School setting. While learning cannot be a presumed outcome of any programme (Oude Rengerink et al., 2011), students and staff identified the portfolios as being pivotal in learning for the portfolio assessment.

#### **5.4.2 Evidence Based Medicine and patient based learning**

Patient based learning provided the content against which students were assessed. Some clinical educator participants reported that portfolio teaching led them to extend their own reading and exploration of relevant scientific literature. Setting an example of principled patient management is seen to promote the integration of these values by students (Oude Rengerink et al., 2011). Students identified learning within a patient centered approach and the incorporation of current evidence (Evidence Based Medicine) to be important in managing patient care. A caring principal is best integrated into personalised patient care (Doshi & Brown, 2005) which was reinforced in the portfolios by virtue of the patient centered portfolio learning.

#### **5.4.3 Supervision of learning and tutorials**

Students prepared patient studies for their portfolios under the supervision of the clinical educators. This development of learning goals and feedback to promote learning formed the formative assessment within the portfolio assessment system design. Time for discussions, teaching and feedback was made both in the clinical setting and in academic tutorials which were seen to be valuable by both students and clinical educators. The success of a portfolio design is cited as being clearly identified learning outcomes, learner autonomy and responsibility for learning within a supportive student/clinical educator relationship (van Tartwijk & Driessen, 2009). All of the above were represented in the portfolio assessment system. Feedback has been identified as having a precarious balance (Molloy, 2010); however, this balance seems to have been found within the URCS where the relationship between students and clinical educators was reportedly a positive one.

#### **5.4.4 Impact of clinical placements**

Students acknowledged that the URCS offered them a wide range of opportunity to develop clinical skills in the workplace. Similar to students in Asia (Widyandana, Majoor & Scherpbier, 2010), the URCS students' experienced burdens of increased responsibility which impacted on the students' experience. The tensions between clinical learning, patient care and academic learning, particularly in the longitudinal rotation, were not always well balanced which was recognised by both clinical educators and students. Students found compiling portfolios time consuming and voiced a need to have allocated academic time over and above the weekly tutorials.

#### **5.5.1 Assessment**

Using portfolios for formative and summative assessment within the URCS provided an assessment approach which promoted student confidence in learning. This was a new assessment process for most of the clinical educators and all of the students. Accordingly, there were challenges experienced along the way and the flexibility within the design made adjustments possible during the course of the academic year.

#### **5.5.2 Formative assessment**

The documentation of formative assessment was not included in the design of the portfolio assessment system. This can be viewed as a gap in the design of this assessment system and offers an explanation for the lack of formative assessment comment passed by either the student or clinical educator participants. However, the learning experience within the portfolio assessment system was valued, suggesting that the focus of the formative assessment was indeed on assessment to promote learning rather than assessment of learning, thus supporting the instruction for formative assessment to support learning opportunities. The close rapport, which developed between clinical educators and the students in this study further facilitated the formative processes within the design.

Formalising formative assessment processes in the future will enable rigorous evaluation of the assessment system, particularly where clinical educators are required to supervise larger student groups and where physical distance between students and clinical educators limits formative assessment interactions.

Divergent approaches in patient management between the discipline specialists of the traditional rotation and family medicine specialists of the longitudinal rotation emerged during the formative assessment of the longitudinal model students. This student's experience suggests that the formative assessment experience was not always a positive one suggesting a possible lack of preparedness on the part of assessors for the longitudinal

students. It is not clear from the students' data if the formative assessors were clinical educators or other health care professionals.

### **5.5.3 Summative assessment**

Guiding student learning in the development of the portfolio patient studies for formative assessment was less challenging for clinical educators than that of using the portfolios for summative assessment. Clinical educators found the summative assessment tool difficult to use initially. Confidence in the use of this tool improved over time, supported by workshops for skills development. Inconsistencies in the use of the summative assessment tool were noted by students early in the year which raised anxieties about marks. However, there was a shift away from the importance of achievement and assessment towards valued learning and the impact of knowledge on patient care.

Some challenges were identified in the summative design and the summative assessment tool was not embraced in its entirety. Some students found portfolio learning to be outside of their favored approach to learning. One discipline suggested that the assessment tool in its current form is not suited to summative assessment and adjustments were recommended for this discipline. The value of using patient studies developed in the formative setting was also questioned by some clinical educators.

Assessment is the pivotal point for learning programmes (Quinn & Hughes, 2007).

Continued discourse, development of skills and understanding in the utilisation of portfolios for summative assessment is required in building confidence and insightful use of portfolios for assessment.

### **5.5.4 Development of assessor skills and standardisation**

The pedagogical experience and training of the clinical educators varied, and ongoing support and mentorship was provided both in workshops and within the clinical environment. While guiding the compilation of the portfolios and formative assessment were manageable, the summative assessment was identified as being more challenging. Having an expert joining the assessment process provided an opportunity for skills development.

The role of experiential learning (Kolb et al., 1999) in the development of clinical educator and assessor skills needs to be emphasised. The transfer of skills through experience is vital where clinical educators responsible for teaching and assessing medical students do not

always have the benefit of formal education training. Medical clinicians responsible for teaching require a paradigm shift from that of clinician to that of reflective clinical educational practitioner if educational practice is to be aligned with best practice (Peeraer et al., 2011). A lack of standardisation in the approach to assessment between clinical educators from different disciplines was discerned. While the study does not measure the reliability of the portfolio assessment, this very lack of consistency between raters would tarnish the reliability of the assessment tool. Norcini et al. (2011) identify the importance of assessment being consistent, credible and aligned with standards. The literature identifies a lack of standardisation in programmes which is problematic (van Tartwijk & Driessen, 2009. Widyandana, Majoor & Scherpbier, 2010).

Identifying clear learning outcomes for clinical educators in the mentorship and supervision programmes is suggested to develop teaching and assessment skills of medical educators. Explicit frameworks are available which can guide medical educators in clearly identifying the roles of assessor, students, clinical educators, patients, academic and health care institutions (Burch 2007, Mullan et al., 2010, Norcini et al., 2011).

## **5.6 Summary of findings within the URCS context.**

In developing the portfolio assessment system for the URCS, African solutions have been adopted (Burch & Seggie, 2008). This “low tech” approach utilising authentic patients was further adapted for region specific purpose. Within the context of this study three overarching themes emerged: learning occurred; the flexible design in the portfolio assessment system made changes to improve the system possible within the same academic and finally that participants were not always clear on the meaning of pedagogic terminology. Valued learning emerged as a dominant theme and despite anxieties regarding the final examination, none of the students expressed fears of failing the examination, suggesting that portfolio learning in combination with the total learning package of the URCS promoted student confidence in their learning and ability to apply this learning to their clinical reasoning. Stark and Fortune (2003) propose that developing countries adapt and not merely adopt medical education trends set in the developed world.

## **5.7 Recommendations**

Exploring ways of sharing information, experience and expertise in managing expanded rural teaching platforms can promote the competence of emerging health care practitioners both within and outside of South Africa. Future in depth studies of the use of portfolios within a rural education platform in developing countries should be considered.

Students who remained within the specialist hospital rotation of the University of Stellenbosch Medical School did not use portfolios for assessment. Measuring and comparing the differences between students' experiences could provide further insights into factors promoting successful supervision of students within the context of the patient care team (Michaelsen et al., 2008). The ongoing development of educational skills for clinical educators will promote the quality of the portfolio assessment system. Formalising and documenting the formative assessment processes is recommended. This becomes crucial when the clinical educator:student ratio do not allow efficient verbal feedback within an interpersonal contact session.

## **5.8 Conclusion**

This chapter has explored the findings of this study and positioned these within a framework of current and relevant literature. Within this study, the portfolio assessment system was strongly supported in the promotion of learning. The assessment using the portfolios faced challenges, but confidence in the system grew over the year as both students and clinical practitioners became more confident. Discrepancies in the quality of assessments suggest that there is an ongoing need for further assessor skill development and learner and clinical educator orientation to the identified learning outcomes.

## Chapter 6 Conclusions

### Conclusion

The portfolio assessment system was supported by both students and clinical educators as being appropriate within a Rural Clinical School setting. In preparing portfolios for assessment, students reported confidence in their learning and most clinical educators supported the development of learning to be a positive one. This is a finding reflected in the literature.

Portfolios provided real patient studies for formative and summative assessment. A prescribed list of common conditions provided a valued framework for the development of patient studies to meet the learning outcomes of the portfolio assessment system. Formative assessment was designed to promote learning and to be an integral part of the portfolio development. While the formative assessment was well integrated in this portfolio assessment system with low student numbers, this finding may not be transferable to larger groups with a lower staff ratio. Careful consideration of the impact of a larger student group is suggested.

In the summative assessment the portfolio documents themselves were not assessed or rated. Patient studies from the portfolio were selected by assessors and utilised in the assessment discourse. There were some reservations in support for the portfolio assessment system for summative assessment, suggesting that adjustments and ongoing review and evaluation of the tool are required. The inherent review processes and flexibility of the assessment tool was valuable and made it possible to institute adjustment to the design in order to address challenges and problems as they were identified.

Disparity between URCS and main campus assessment and the impact of this assessment on their final marks between were a concern for students. Further investigation of the perceived disparities is recommended. Students found compiling



portfolios a burden initially, but the worth of the portfolio learning was supported over time.

The positive relationships that developed between the students and clinical educators over the course of the year, coupled with the confidence which students had in their learning, suggests that face to face teaching is a valuable resource, especially within a rural setting which may face greater electronic challenges than a main campus.

The pedagogical training and experience of the clinical educators varied and workshops facilitated by a portfolio assessment expert were seen to be positive in providing both information about the portfolio assessment system and in developing assessor skills. Consistency in the use of the assessment tool is reported to have been problematic. The ongoing support and development of assessor skills was seen to be important in sustaining and improving the assessment for the current students as well as planning for the following academic year.

Portfolios offer an assessment system which engages students in the application of learning in using real patients. This portfolio assessment system did not need high levels of technology or skills laboratories to sustain it. This suggests that the system would be transferable to other rural or resource limited settings.

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## **Addendum A: Questionnaires used to guide data collection during first phase**

### Key Questions to be used in Phase 1: Focus group for students

1. How helpful was the portfolio orientation process?
2. How have the portfolio materials provided been helpful?
3. Is the portfolio a worthwhile learning tool?
4. What has been the most significant positive aspect of the portfolio as a learning tool?
5. What challenges have you faced in compiling your portfolio?
6. What specific administrative challenges did you experience in the compilation of your portfolio?
7. Was there adequate opportunity for discussion with your mentors? If no, please elaborate.
8. Did you receive adequate educational support and feedback during the process of compiling your portfolio?
9. What are the areas that you feel have been managed well?
10. What have you learned about the way in which you learn?
11. What could change?

### Key Questions to be used in Phase 1 for educators

1. How helpful was the portfolio orientation process?
2. How have the portfolio materials provided been helpful?
3. In your opinion, is the portfolio a worthwhile learning tool?
4. What has been the most significant positive aspect of the portfolio as a learning tool?
5. What challenges have you faced in supporting students in the development of their portfolios?
6. What administrative challenges have you faced in supervising the portfolio assessment system?
7. Have you felt supported during this process What are the areas that you feel have been managed well?
8. Do portfolios offer an appropriate learning tool for students working in your discipline?
9. Do you feel that students will be well prepared for assessment?
10. What could change?

## **Addendum B: Questionnaires used to guide data collection during second phase**

### **Phase 2 Second round of questions for staff:**

1. What did you find most challenging in adapting to this portfolio assessment system?  
Watter area het jy die mees uitdagendste gevind tydens die aanpassing by hierdie portfolio assesserings sisteem?
2. Did you find the portfolio workshops conducted during the year to be helpful?  
Het jy die portfolio werksinkels, wat plaasgevind het gedurende die jaar, behulpsaam gevind?
3. Would you recommend these to be continued in the next academic year?  
Sal jy aanbeveel dat daar met hierdie werksinkels voortgegaan word in die nuwe akademiese jaar?
4. Do you recommend any changes in the workshop format?  
Wil jy enige verandering in die formaat van die werksinkel aanbeveel?
5. Data from the first round of interviews indicates that the portfolio has been a worthwhile learning tool. If you disagree with this statement please could you explain why?  
Data ingewin tydens die eerste rondte onderhoude, dui daarop aan dat die portfolio n waardevolle hulpmiddel was. Indien jy nie saam met hierdie stelling stem nie, verduidelik asseblief waarom nie.
6. Data from the first round of interviews suggests that this assessment system has provided an assessment tool which is objective. If you disagree with this statement please could you explain why?  
Data ingewin tydens die eerste rondte onderhoude, dui daarop aan dat hierdie assesserings sisteem n objektiewe assesserings hulpmiddel verskaf het. Indien jy nie saam met hierdie stelling stem nie, verduidelik asseblief waarom nie?
7. Do you recommend any changes to this assessment system?  
Sou jy aanbeveel dat verandering aangebring word aan hierdie assesserings sisteem?
8. Are there any additional changes you recommend for this portfolio assessment system  
Is daar enige addisionele verandering wat jy sou aanbeveel vir hierdie portfolio assesserings sisteem?

### **Phase 2 Second round questions to guide student interviews**

1. Did portfolio compilation become easier to manage with time?  
Was dit mettertyd makliker om die saamstelling van jou portfolio te behartig/bestuur?
2. What aspects should change to make the portfolios as a learning and assessment system more efficient?  
Watter aspekte van die portfolio moet verander word om dit meer geskik te maak as 'n leer en assesserings stelsel?
3. In what way (if any) was the portfolio assessment system workshop facilitated by Prof Burch in July useful?

In watter opsig was die portfolio assesserings stelsel werkswinkel wat gefasiliteer is deur Prof Burch in Julie, waardevol?

Feedback from this group was use to inform adaptations to the portfolio assessment system

Addendum C: Copy of URCS PowerPoint compiled by Burch and Conradie for December 2010 Workshop

8 December 2010

Portfolio Assessment Workshop

Welcoming and Introduction: Prof. Hoffie Conradie

Facilitator: Prof. Hoffie Conradie

### **Portfolios: Learning and Assessment Tool**

Presented by: Prof. Vanessa Burch

#### Basic principles of learning

How did you learn to ride a bicycle?

- Must want to learn
- It must be a pleasant experience
- Never stop learning, you continue to learn
- Start small

#### What is a portfolio?

- Shows cases and reflects on outcomes of person
- It is facts and data reflected on.....with wisdom
- It is a proof of what you have learned
- It is a reflection of patients that have been seen
- It is evidence of what has been done, with quality
- It shows the growth of students, the reflection shows that there is new knowledge acquired

What can be included in a portfolio?

- Design must have outcomes to meet (based on outcomes)
- Case studies on what was presented, from symptoms to treatment
- Log book of procedural skills
- Conversational tasks (e.g. planning of informed consent)
- Learning issues from day to day
- It must have a section for personal development and a section for clinical learning
- Evidence based medicine
- Community related matters
- Biopsychosocial learning

Rural Clinical School

- Series of case reports of patient management
- Reflection of case management

What learning can take place?

- Knowledge that is case based
- Skills: interpreting clinical data, clinical reasoning, writing good clinical case notes, writing referral and discharge letters, prescription
- Attributes: team work, reflective practice, professional behaviour with colleagues and patients

Do portfolios stimulate reflection?

In action reflection: - busy in process

- First go assessment
- What goes on the intake
- First phase of reflection

On action reflection: - process of inclusion

- Adding what you did not know to what you have constructed

Facilitator: Prof. HOFFIE Conradie

#### Objectives of the workshop

- Format of portfolio
- Formative assessment
- Summative assessment

#### Chronic patients

- Ethical dilemma
- EBM
- 

#### Formative assessment

- On ward round discussions
- With consultant
- During interactive days

#### Decisions made by the MBChC program committee – Prof. Ben Van Heerden

- Closing the link with the students
- Prof. Budgie will be visiting the sites once a week

#### Summative assessment

Portfolio marks:

- 40% for Worcester end of block
- 60% for Longitudinal end of year
- 🚧 Avian Park Clinic will be part of Family Medicine project

Blocks:

Anaesthetics	Medicine	Obs & Gynae	Surgery
ENT			
Orthopaedics	Psychiatry	Paediatrics	O?
Urology			Family Medicine

↓

April exams

↓

November exams

Prof. Vanessa Burch:

- Do three medicine cases, one examiner per station
- A single examiner is better than double
- UCT students would have one call per week till 11pm