A JOURNEY THROUGH PHARMACEUTICAL EDUCATION IN THE LAND OF THE BRAVE

A PORTFOLIO SUBMITTED IN FULFILMENT

OF THE REQUIREMENTS FOR THE DIPLOMA

POSTGRADUATE DIPLOMA IN HIGHER EDUCATION

OF

THE UNIVERSITY OF NAMIBIA

BY

MICHAEL GEORGE KNOTT

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MAIN SUPERVISOR: Dr Louise Hughes (Cardiff University)

DECLARATIONS WHICH MUST BE CONTAINED IN THE SUBMITTED THESES/ DISSERTATIONS

DECLARATIONS

I, Michael Knott, hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.

Michael Knott		24/11/2017
Name of Student	**Signature**	**Date**

Abstract

The purpose of this portfolio is to train Higher Education educators (such as myself) who are in the teaching profession without a qualification. In these cases teaching skills are often needed to enhance the quality of teaching at a tertiary level. This portfolio therefore aimed at demonstrating my ability to fuse teaching theory and methodology with my existing knowledge of the pharmacy profession to meet the students' academic needs as well as those of the stakeholders and Namibian society.

In this portfolio the reader will be taken through my unique education learning journey. Here the reader will learn and share in my development from a novice lecturer into one who demonstrates more advanced insight and skills surrounding this specialised activity of tertiary education in a Namibian setting.

In broad terms, the educational themes covered in the portfolio include place, people, adult education, curriculum, teaching and assessment.

To my four year old daughter, Annabelle Maria Knott, thank you for teaching me so much about life…

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Preface

A clear "picture" of who you are professionally and your vision as an academic in your institution

My name is Michael. I have had a number of roles or even labels in this life; husband, father, pharmacist, drug discovery researcher, sailor, traveller, writer and even historian. However, in March 2014 I was given a new role, that of senior lecturer in pharmaceutical science at the University of Namibia. As the newly appointed module co-ordinator, I was to roll out medicinal chemistry to 3rd and 4th year pharmacy students for the first time (at the School of Pharmacy).

I was excited about this new opportunity in Namibia. I had done some part-time lecturing before and had extensive working knowledge of various pharmacy related matters. I had also recently completed my PhD in marine natural product chemistry at Rhodes University (in South Africa). Based on this, I believed that I was well qualified for the world of tertiary education. I had worked in numerous hospital and community pharmacies and had counselled numerous patients about medicine. Surely, this would be sufficient when educating students in a university setting! Those were my initial perceptions and beliefs. Then started my journey with pharmaceutical education in Namibia (also known as the Land of the Brave).

I soon realised that the above mentioned assumptions had all been wrong! I soon recognised that I had a great foundation in scientific pharmacy knowledge, but little in terms of education skills and theory. I had to learn fast. Obviously, a number of questions suddenly came up from this new educational environment, such as, what are the context and principles of this brave new world into which I had just stepped into? Who are these students? How does one design a new curriculum or even a new module from scratch? What is teaching actually all about? Do I have the skills? After teaching comes assessment, how does one assess correctly? Why do we evaluate lecturers and students? Whilst teaching, I also wished to research and publish. As a result, I got a post-graduate student. Then, I soon realised that I needed to know more about student supervision. Good research and publications need good supervision and do not happen on their own.

Whilst struggling to swim in the high waters of educational academia, accompanied by a flood of unanswered questions (mentioned above), I was offered a chance to take up a unique

student position. The University of Namibia (UNAM) was to pilot a Postgraduate Diploma in Higher Education for its lecturers. Was I interested?

When you are drowning in the educational swamps and someone throws you a life-jacket and a rope, you don't hesitate or waste time. You say, "Thank you, yes please!" and register as soon as possible.

For me, my pillars of strengths before I joined UNAM were community pharmacy as well as drug discovery research. Education as a pillar of teaching and learning skills was lacking… The Postgraduate Diploma in Higher Education was just what I needed build the third educational pillar. The diploma was also a bridge linking all three pillars together for my career as a successful academic.

This portfolio is an attempt to document my journey in Namibia, not as a tourist on safari, (which is normally the case) but rather as a healthcare professional learning to become an academic. It contextualises my understanding and interpretation of an educational paradigm and gives a glimpse of the road I had to travel in order to make sense of the role medicinal chemistry plays in Namibia (at the School of Pharmacy). I have tried to make sense of the flood of questions mentioned above, in order to demonstrate that I have transcended a number of educational naivetés. The golden thread is typical of the journey any person new to university education setting might experience. However, it is firmly set in the context of teaching and learning medicinal chemistry in Namibia. It starts with;

- What is this place (context of adult education)?
- Who are these people (profiling students) and what is adult education all about (principles of adult education)?
- What is a curriculum and how can I improve the curricula?
- Can I teach? What skills are needed for teaching and learning?
- How do we evaluate and assess?
- What am I hoping to achieve in the future?

Each chapter underlines the principles and theory learnt and then asks two application related questions, “What does it mean for my teaching?” and “What will I do differently in the future?” The aim of these questions if to address my ultimate goal which is how to provide students with the education and support they need to become outstanding pharmacists.

This is a journey of one man who initially drove to the School of Pharmacy (in Namibia) with the idea of staying for three months only. Four years later I am still here reflecting on what actually happened…

Chapter One

What is this place (context of adult education)?

When working in Africa, it is important to demonstrate an understanding of the foundational, historical and philosophical development of Higher Education as well as key factors for successful teaching and learning in Africa.

Write a coherent account of the relationship between the higher education context and perspectives and the practice of teaching and learning, paying a particular attention to the following aspects:

1. The impact of Higher Education context on your institution.
2. The implications of these contextual factors to Namibian teaching and learning practice.
3. Using the concepts of structure, culture and agency assess the possible trajectory for how teaching and learning in your context/discipline may evolve.
4. Demonstrate your understating of how to become a reflective practitioner (criticality, reflectivity and praxis).
5. Draft your teaching and learning philosophy.

1. The impact of Higher Education context on your institution.

The impact of Higher Education context on the University of Namibia (UNAM) is both profound and extensive. It involves multifactorial changes which need to be understood and embraced in order for the future of the University of Namibia to succeed. In terms of Vision 2030 (Namibia's vision for the future) Namibia is to be transformed into a knowledge based economy by 2030. Bearing this in mind, the University of Namibia therefore has a very important role to play in the aspirations of Namibia as a country. To this end, it was decided that Namibia should have its own School of Medicine and Pharmacy to support the healthcare needs of the country. UNAM comes from a previously disadvantaged background. During the apartheid era UNAM was a teacher training college. However, today the situation is very different. At its heart, UNAM holds the following vision, mission and values (University of Namibia, n.d.):

Vision

To be a beacon of excellence and innovation in teaching, research and extension services.

Mission

To provide quality higher education through teaching, research and advisory services to our customers with the view to produce productive and competitive human resources capable of driving public and private institutions towards a knowledge-based economy, economic growth and improved quality of life.

Values

- Professionalism
- Mutual respect
- Integrity
- Transparency
- Equity
- Accountability

A university does not stand alone, it is a body which must respond to internal (staff and students) and external forces (from society and government) as these are the two core funding sources of funding which account for the running and functioning of the university.

Financial factors

In line with global economic trends, universities in Southern Africa also have financial difficulty (Habib, 2016; Herman, 2016), with the University of Namibia being no exception. As recently as this year UNAM put a stop to all international travel, office furniture and end of the year parties. This is of growing concern as it raises several questions about the financial position of the university and hence our future as teachers at the university. This places a lot of pressure on the university and the staff members who feel unsure about the future.

Education should no longer be a luxury that just the rich are able to afford. However, in many cases, it remains so. Education at UNAM is not for free and in most cases students

have to obtain hefty loans from the bank which may take years to repay. This adds an enormous amount of pressure on the student and often the students' family as have to sign surety at the bank. The current tuition fees are approximately in the range of N$ 20000 to N$ 35000 per person per year. However, this is still a fraction of what tuition fees are in the United Kingdom (UK) for example. In UK home students pay approximately £ 9000 (N$ 170000) per year for tuition, while foreign students pay approximately £ 18000 (N$ 340000) for one year of tuition. In addition, many Namibian students also have bursaries or low interest loans with NSFAS (Namibia Students Financial Assistance Fund). Other students are funded with bursaries from private companies (which they normally have to pay back by working for the company for a fixed period of time). Some students are simply self-funded or supported by their parents.

Competition from other universities in Namibia

UNAM is not the only university in Namibia. Recently, the Polytechnic renamed itself the Namibian University of Science and Technology (NUST). In addition, the government recently approved the opening of a private university in Windhoek. These are both examples of national external threats to UNAM. UNAM must respond in a manner which distinguishes it as a centre of excellence in Namibia if it is going to survive in the long term. How will this be done? How will UNAM convince the government and public that it is a market leader in terms of quality education and that it delivers the best education product? What is the university doing to ensure that it has the best facilities to attract the best students? For example does UNAM have fast and reliable internet, top class sports facilities, top resources and great lecturers? Is UNAM preparing itself and its students for life in the future? How does society perceive UNAM graduates? Better or worse than those students coming from the NUST? These are all important question involving the impact of higher education context on the institution.

Access and demographics

In terms of access to higher education, Namibia faces some serious challenges. For example, Namibia is one of the largest and least populated countries in the world. The difficulty that UNAM faces is how to make higher education accessible to all. To address this task, UNAM has a number of satellite campuses in strategic locations around the country, for example one can also find UNAM in Henties Bay, Keetmanshoop, Rundu, Oshakati etc… In addition,

UNAM also offers a number of long distance courses which can be done online *via* e-learning.

In order to implement diversity at UNAM, selection is based on regional representation. Therefore, to enter into a top program such as medicine or pharmacy does not solely depend on good grades, but more importantly, the region that you come from. However, this system is not perfect, as although access and demographics are improved through this mechanism, many of these students are not top performers and often fail many subjects in first year. The lecturer therefore needs to be aware of this and react accordingly by giving extra tuition to the students if needed. Access to university education should be for all and people often see higher education as a passport for success. This increasing demand for higher education tends to lead to massification of education, which also has numerous advantages and disadvantages which need to be ironed out, as quality is more important than quantity.

On the positive side

Although the context of Higher Education at UNAM faces many challenges, UNAM is still amongst the top universities in Africa, and most often, UNAM faces fewer challenges than a number of other African institutions of higher learning. For example, in South Africa, the year 2016 has been plagued by constant student protests and demonstrations. Fortunately, student activism is relatively rare at UNAM. Compared to other African universities, we also have a large amount of academic freedom and autonomy and we work in an open and enjoyable environment (without oppression or fear of talking or discussing new or radical concepts). This kind of atmosphere suites my temperament and beliefs. In addition, the curriculum at UNAM is not limited, for example, there are a large number of varied courses which are on offer. As a result, UNAM can honestly say that it offers an opportunity for higher education and development to the whole population of Namibia. This is something that should be cherished.

Conclusion

The impact of Higher Education context on UNAM is guided by the university's vision, mission and values as mentioned above. Whenever the university faces difficult decisions, it is important to revert back to the original vision, mission and values as a guide in 'stormy times'.

2. The implications of these contextual factors to Namibian teaching and learning practice.

The impact of higher education context on the institution (as discussed above) is not limited to the outside world. These contextual factors spill over into the classroom and affects the practice of teaching and learning in a variety of ways. It is important for both the student and lecturer to be transparent and aware of these factors, for example;

Financial factors

Education at UNAM is not for free, as a result most of the students' have large loans to pay off. I did a survey of the class and it turned out that approximately 30% of my students cannot afford food to eat on a daily basis. Obviously, this has a massive impact of learning. No matter how good a lecturer you are, a student with a hungry stomach will not be able learn or concentrate at optimal levels. These results immediately make me think of Maslow's hierarchy and its' impact on my students. Without attaining the basic physiological needs such as food, one has very little chance of attaining the goal of self-actualisation. The remainder of the students might be able to afford food, but what about, clothes, safe accommodation, stationery etc? A good student needs to have a strong support system and resilient internal locus of control (in addition to meeting the basic physiological and safety needs for success).

Still, it is very difficult to succeed at university when you have all the required support and resources. However, this is not the norm with my students. As a result, a number of students have part-time jobs. This drastically reduces the number of hours a students has to learn and complete assignments and therefore often has a direct impact on the students' grades and success rate.

Cheaper rent also means living in more dangerous areas. A survey revealed that in terms of safety, approximately 41% of my students had been robbed or attacked in Windhoek during his/her undergraduate studies. Both the lack of food and security, shocked me into understanding the reality of the situation at UNAM.

Based on these surprising findings, I found myself a lot more compassionate towards the needs of the students.

Competition from other universities

Competition is real… If the School of Pharmacy is not doing a good job, why not simply go to another university, maybe one in South Africa? UNAM needs to prevent the brain-drain, of both lecturers and students in order to maintain a high and ever improving teaching and learning practice and standards. Top students are often retained with the use of bursaries, whilst lecturers are paid relatively well compared to their South African counterparts. For example, the inclusion of a housing allowance and medical cover for all UNAM lecturers is a good incentive.

One of the big questions posed by Scott (2015), is, will universities survive globalisation and postmodernity in the future, or will its place be taken by new forms of knowledge organisation? Scott (2015) suggests that the new environment will test the resilience of universities to their limits, however, universities will survive. However, very real threats such as the massification of knowledge via Massive Open Online Courses (MOOC's) will be a direct threat/competition to universities as well as teaching and learning. For example, why go to an expensive university to learn, when you can download lectures for free in the comfort of your home? Are MOOC's more globally accredited than a UNAM degree? What can a university provide which MOOC's cannot? For now, this is not a serious threat because MOOC's are not accredited with the National Council for Higher Education (NCHE) or the Namibian Qualifying Authority (NQA). However, should this change in the future, this could severely threaten Namibian universities as well as revolutionise the teaching and learning environment at UNAM as well as other Namibian institutions.

Human resources

A number of challenges also face management and academics in the new workplace (Webster and Mosoetsa, 2001). For example;

a) The changing student clientele and the need for academics to be sensitive to these needs.

b) The shift away from the traditional curriculum and the resulting multi-disciplinarity and team teaching.

c) The impact of mergers of departments on traditional lines authority.

Knowing about globalisation and management challenges is one thing, and it suggests that people must be prepared to adapt. However, resistance to change is a topic which can also have a negative impact (Quinn, 2011) on the management of a university as well as the staff.

For example, why do academics demonstrate resistance to activities aimed at professionalising academic practice? Especially when it can clearly be seen that the profession is changing fast and changes need to be made to improve on the old ways of providing a quality education. Good research does not necessarily equate to good teaching – for example, lecturers which are often top researchers often know too much, expect too much and can't communicate at a basic level with the students. Internationally, courses on higher education are being rolled out for all academic staff, therefore it is just a matter of time before UNAM does the same. This course should be embraced by lecturers and not become a victim of resistance to change. The reason for this is that the Postgraduate Diploma on Higher Education (PDHE) aims to improve teaching and learning practice and hence transform and elevate the profession of higher education teaching. For me, these findings reinforced the idea that my students need top quality international education which had been uniquely tailored to the needs of Namibia. To do this, I needed to learn all I could about delivering and implementing outstanding tertiary education lecturing and learning skills.

Access and demographics

The only language of instruction at UNAM is English (UK). The national language of Namibia is English. However, there are very few English first language speakers in Namibia (less than 0.5% of the population are native English speakers). With this in mind, I decided to speak very slowly and clearly in class. I also asked more questions than usual to the class to ensure that we all understood each other. In addition, during the lecture, I would sometimes pick out fundamental words which I felt were critical to the understanding of the topic and ask the students to explain their understanding of these words to the class.

On the positive side

Although the students at UNAM face a number of challenges, they remain psychologically positive and enthusiastic. This was a revelation to me. In spite of all the difficulties and stress faced by the students, they are mostly very optimistic and happy. Teaching and learning in a happy, motivated and enjoyable environment is key to my philosophy of

teaching and learning. This kind of environment promotes a healthy exchange of ideas as well as student participation within the classroom, which in-turn facilitates an enjoyable and productive experience for all in the classroom. This positive energy is also a two way street. If the lecturer is passionate and enthusiastic, some of this will rub off onto the students. If the students are positive and enthusiastic to learn, the lecturer will also feel more inclined to give a better 'performance'. This is also linked with Section 5 of chapter 1, which involves the drafting of a teaching and learning philosophy.

Conclusion

The criteria of effective teaching in a changing higher education context evolves reflection and continually responding to the contexts in which learning and teaching is undertaken (Devlin and Samarawickrema, 2010). Therefore academics must be ready and prepared to respond to the environment. In conclusion, the implications on the teaching profession and student learning seem to suggest that the only constant is change and that as teachers we can expect literally anything to happen in the future! Knowing this is key to preparing for an exciting and challenging Brave New World.

3. Using the concepts of structure, culture and agency assess the possible trajectory for how teaching and learning in your context/discipline may evolve

Realist social theory from Archer's morphogenetic approach is based on critical realism and is centred on structure, culture and agency. The object of social realist research is to develop explanations of observed and experienced phenomena that point to causal relations at the level of that which cannot be observed. Archer shows us that the interrelations of culture (the world of ideas) with social structure cannot be ignored and are influenced by social interactions and socio-cultural interactions (Case, 2013). In addition, structure and culture work together to condition the environment that human agents will enter.

The University of Namibia has been structurally and culturally conditioned by a set of complex prior interactions. A lecturer or student enters a world of enablement's and constraints. Agents (lecturers or students) will confront a situation which is shaped by both structural and cultural properties. What happens next according to Archer's morphogenic framework are a series of interactions between agents in a social space. Interactions between

students and lecturers, students and students etc… These interactions might be social interactions (informal) or socio-cultural interactions (lecturing).

In terms of the intersection of morphogenetic cycles in structural and cultural domains (Case, 2013)

- Cultural conditioning (world of ideas) follows into lectures.
- Structural conditioning (roles and resource's) follows into informal social interactions.

Both of these end products may interact with each other, or further undergo elaboration and reproduction and later in feed into the other at the beginning of the conditioning cycle. This fascinating cycle shows the interplay between structure, culture and agency. All three aspects are interlinked and cannot exist without the other (Case, 2013).

As technology gets cheaper and better, structure, culture and agency may revolve less around people (ie lecturers) and more on technology. For example, why employ lectures if you have already recorded their sessions and are simply able to play them back to the students? In the future far fewer staff will be employed at universities as the 'education system' becomes more automated and student driven. The staff that might be employed, will not be lecturing students, but overseeing systems. Imagine a future where all lectures are downloaded onto the students' computer and where all the resources are online.

Will there still be a need to have a university at all? Libraries and physical lecture halls might become archaic remnants of another era. Teaching at universities will cease and universities primary role might be Research and Development (R&D). However, if the role of R&D is taken over by industry, then universities as we know them today will be obsolete.

Without structure, then culture and agency will be on a very different trajectory and Archer's theory of social realism might need to be completely rewritten. In addition, if lecturers and expensive buildings are no longer needed, tuition fees should plummet and this will enable more students to participate in learning (leading to the evolving of massification of education and possibly a decline in the quality of education as fewer lecturers will be involved.) In addition, as the educational reins leave the hands of the lecturers and move into the hands of

technology and students, the humanistic experience of a university education will also sink and this might further fragment the emotional/human aspect of caring and social responsibility within our community. For example, this will result in a lack of people to people learning opportunities. In terms of pharmaceutical education, it is all about people to people interactions, also known as social constructivism. These important skills cannot be learnt on an iPAD. For example, what happens in a community pharmacy? The pharmacist speaks to people, he/she listens, empathises, counsels and educates. A machine can provide a product and medication information, but surely this is not sufficient when healing a person with emotional needs as well? We are human beings, with feelings and complex needs. Can a machine or computer replace the value of another pharmacist?

What about practical skills-based learning, which is also a key part of pharmacy education? Pharmacy students need to have key core skills which can only be practised and tested in the 'real' world with people and on people. For example, manufacturing glycerine suppositories to a specific strength, or tailor making total parenteral nutrition (TPN) for hospital patients. The practicals skills and aspects of being a pharmacist make this course unique. In addition, pharmacy is a profession with laws and ethics which need to be applied in sometimes very tricky situations. It is not simply a list of facts or concepts all thrown together and discovered online!

4. Demonstrate your understating of how to become a reflective practitioner in a university (higher education) setting (criticality, reflectivity and praxis)

In higher education settings, according to (Murray, 2008), 'criticality' is understood as a *distinctive orientation to ideas and approaches*. To be critical in the higher education setting one needs to attempt the following:

a) Compare and contrast concepts or theories
b) Distil from the theories a few themes
c) Discuss underlying assumptions
d) Discuss the wider ideas that might have influenced the authors
e) Discuss connections and differences
f) Discuss the methods by which different people arrive at the same conclusions

Any of these approaches if applied correctly demonstrate that one has moved beyond simply understanding the topic and is now able to achieve a 'critical understanding' of the topic.

'Reflection' and 'reflective practice' are key pieces of the educational code. Underscoring this notion is the idea that personal effectiveness is an essential component of professional effectiveness. Changes in ideas and practice are recorded as well as what one has learned or how one has developed. In addition, writing down these experiences helps to develop and consolidate ones thinking (Murray, 2008).

'Praxis' is the process linking theory and practice so that they are integrated in order to effect action and change. It requires using conceptual ideas as tools for deepening the understanding of a specific practical experience and inversely uses their analysis of an incident from their practice to clarify an understanding of concepts (Murray, 2008).

Criticality involves questioning and challenging ideas or norms as well as being opening to change and improvement. In terms of the principles of criticality and my teaching practice, I would advise the students and myself to use at least two or three different textbooks for the same topic. This would enable us to better compare and contrast concepts or theories related to the topic under review. Similarly, the public might be comparing the outputs or ideas of different universities and only supporting the institution they trust best. In this way society might also uses the principles of criticality in the community in a broader sense.
As a class we could also discuss or distil the most important themes from the theories and from this discuss connections and differences either *via* orals or assignments. When discussing medicinal chemistry, I would also encourage the class to search for different methods in which theoretical knowledge which can later be transcribed into real world applications and solutions.

The process of criticality would be followed by reflectivity. The process of reflectivity was been defined by Kolb in 1984 and involves testing, experiencing, reflection and conceptualisation (Figure 1.1). Both the students and I could have a session of what worked and what did not work in terms of how the material was studied using criticality as part of the process. This would contribute to both personal and professional effectiveness of the students and myself (the lecturer). Reflectivity on course content and course challenges

would benefit the entire School of Pharmacy. UNAM students might also reflect on their experience at UNAM following the same process, and again, this will also feed into the public eye.

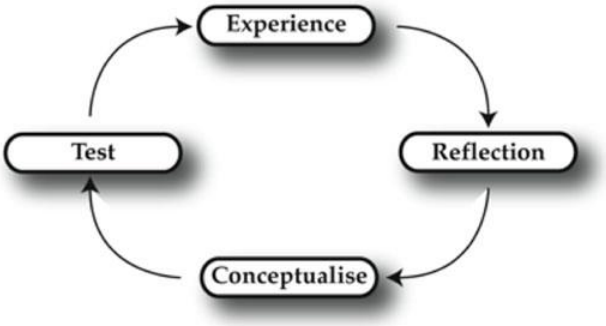

Figure 1.1 Process of reflection (Kolb, 1984)

For praxis, in terms of medicinal chemistry teaching, I would ensure that the theory is fully integrated with both the chemistry practicals and work-based pharmaceutical experiences in the community (and *vice versa*). This would ensure that theory and practice are sensibly linked together in a manner which will fulfil the student and lecturer learning experience. Deepening the students understanding of conceptual ideas could also be assisted by giving lab based, hospital based, or industry based projects in which theoretical concepts need to be used to solve real pharmaceutical problems in the work place. Again, the ability of our university graduates to link theory and practice is going to impact of the way society perceives and supports our university. It is vital that students do not just learn for the sake of learning, but are also able to directly benefit people in society.

In order to become a good reflective practitioner; all three components, criticality, reflectivity and praxis need function together in harmony (Figure 1.2). This is not a one off event, but should happen continuously in order to be of benefit to the lifelong learner / good reflective practitioner. In addition, this is not just something for the individual to consider, but for the entire tertiary intuition as we whole as well.

According to Cunliffe (2014), 'Critically reflexive practice embraces subjective understandings of reality as a basis for thinking more critically about the impact of our assumptions, values, and actions on others. Such practice is important to management education, because it helps us understand how we constitute our realities and identities in

relational ways and how we can develop more collaborative and responsive ways of managing organizations.'

Clearly this is very important in the context of higher education and needs to be mastered and demonstrated by any potential university leaders.

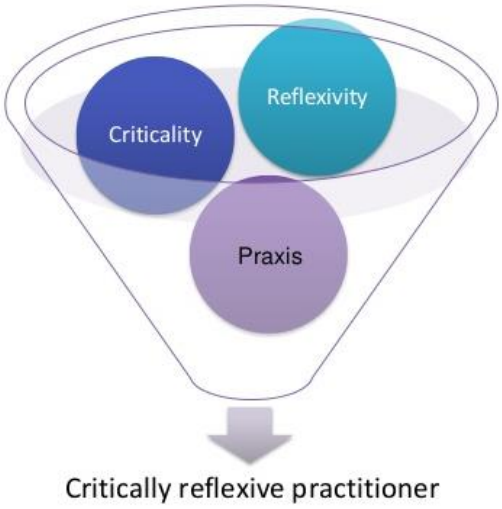

Figure 1.2 The elements essential for a critically reflexive practitioner (Quinn & Vorster, 2014)

5. Draft your teaching and learning philosophy.

When drafting a teaching and learning philosophy, is it important to know and understand all of the above mentioned questions, namely;

- The impact of Higher Education context on your institution.
- The implications of these contextual factors to your teaching and learning practice.
- Using the concepts of structure, culture and agency assess the possible trajectory for how teaching and learning in your context/discipline may evolve.
- Demonstrate your understating of how to become a reflective practitioner (criticality, reflectivity and praxis) in a higher education setting.

Only once this has been internalised and integrated both conceptually and practically, can one proceed with the drafting of a teaching and learning philosophy. Such a statement should include; my concept of teaching and learning, teaching description and justification. But before such a draft can be written, the following questions need to be answered.

What kind of graduates are we trying to produce at UNAM, and how can my teaching be changed or adapted to both better student learning and improve the kinds of graduates that come from UNAM? What are good generic graduate attributes? This is a more fundamental question than what combination of skills, attributes and knowledge should be included on the graduate 'shopping list', it is about the nature of the things on the list, and the nature of the list itself (Barrie, 2006).

Barrie (2006) used phenomenographic research to answer these questions. This kind of research has as its focus an investigation of variation in the process of learning, the process of teaching or a particular concept being taught or learned. The research concluded that the academic community does not share a common understanding of graduate attributes as the core outcomes of university education.

A future might include some or all of the following: rapid technological advancement, globalisation, interconnected economies and communities, climate change, resource constraints, political instability, social surveillance, and the need for graduates to possess creativity and flexibility to manage these complexities (Bosanquet et al., 2010). This raises additional questions such as are the values, philosophies and ideological perspectives underpinning the curriculum as well as those of the institution in line with the future which we forecast?

Over the years the language used by graduates to encapsulate core values has changed from teamwork to an emphasis on the individual and then focus on the community (Bosanquet et al., 2010); in addition, there has been a shift from gaining skills to action-based language and now finally to an emphasis on participation and a sense of obligation. It is important to understand these values and incorporate the values of the day to facilitate better and modern learning.

In pharmacy, this can be done with much success. In terms of community leadership and change (as mentioned above), pharmacists are perfectly placed to implement changes and lead. With respect to language such as participation and a sense of obligation, pharmacists are at the forefront of healthcare in Namibia and this demands participation and a sense of obligation to society. The pharmacy students are having practical experiences in the community, hospitals and industry. In addition, these students are encouraged and 'nudged' into the right direction during class assignments and class feedback where there is already a focus of change, community leadership and participation which affects the design and delivery of the current curriculum.

Draft your teaching and learning philosophy.

To involve myself in the establishment of students' pharmacy related knowledge and their consequential development into professional pharmacists and leaders within the community. I aim to achieve this by meeting each student's individual needs by assisting him/her in overcoming difficulties which hinder a thorough knowledge and comprehension of their work. For post-graduate students I wish to be a committed mentor and always available to assist.

Aspects of students' development that I consider important include:

- Encouraging creative thinking in order to enhance problem-solving skills.
- A keen awareness of current pharmaceutical developments and their impact.
- Development of expertise as well as pharmaceutical professionalism.
- Lifelong learning

My lectures are always transparent and open and I encourage class participation and group discussions whenever possible. I do this by creating a friendly atmosphere in which the students' feel comfortable and willing to engage in the topic being delivered. In order to keep theoretical studies interesting and relevant, I always try and relate various aspects being discussed to 'real' world problems or experiences that I might have encountered before whilst working in industry, hospital or community pharmacy. A similar constructivist approach (that I agree with) was taken by Jonassen (1991) who writes about the concept of 'authentic

tasks' and applied constructivism to the development of learning environments. Jonassen (1991) suggests that lecturers should for example also (Murphy, 1997):

- Create real-world environments that employ the context in which learning is relevant.
- Focus on realistic approaches to solving real-world problems.
- Stress conceptual interrelatedness, providing multiple representations or perspectives on the content.
- Provide tools and environments that help learners interpret the multiple perspectives of the world

I would therefore suggest that my teaching approach is more embedded in constructivism than behaviourism. In terms of professionalism, I endeavour to lead by example. Aspects of the learning environment which I consider important include:

- Creating a space to encourage critical listening and thinking as well as intellectual investigation. In Latin the word '*docendo discimus*' means 'we learn from teaching.' (This is a good pedagogical principle to use.)
- Classes must be challenging but fair.
- Classes must also be fun and memorable.
- Classes must demonstrate high quality and value for the student.
- Collaborative atmosphere of learning
- In order to understand the bigger picture, students must learn to seek, share, apply and enjoy knowledge.
- Instilling truth, compassion and dedication towards the profession

My ultimate goal is to provide students with the education and support they need to become outstanding pharmacists. Being a critically reflexive practitioner will certainly play a key role in underpinning this philosophy. However, this is not sufficient without understanding the impact of Higher Education context of the institution, the implications of these contextual factors to teaching and learning practice, and the concepts of structure, culture and agency (as discussed above). For example, how do my lectures' contribute to Namibia's Vision 2030 is a relevant and meaningful manner? Are my lectures' in line with the vision, mission and values of UNAM? Do I uphold these values in my own everyday life? Will the students see

me as an example to follow? How do the finances of Namibia and UNAM affect my lectures' or the lives and attitudes of my students? Will outside competition from other universities effect the quality of my students or my own performance and motivation? How can I improve the quality of my lectures' whilst improving accessibility and diversity at the same time? How do I get in line with the structure, culture and agency of Namibian students and Namibian society? How can I change students' lives and ideas for better through quality education? How can we all make a better Namibia? Which teaching and learning theories are best suited to the needs of the Namibian people, for example, behaviourism or constructivism or a blended approach?

These were just some of the questions which echoed again and again whilst I was mapping out my draft teaching and learning philosophy within the context of, 'What is this place?'

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Chapter Two

Who are these people (profiling students) and what is adult education all about (principles of adult education)?

The aim here was to demonstrate an understanding of the psychosocial characteristics of the Higher Education. To do this a survey was undertaken to determine the profile of typical Higher Education learners (at the School of Pharmacy) as well as the various factors which impact on Higher Education learners. Important follow up questions included, what are the general professional characteristics of a Higher Education educator? What makes a good lecturer? What educational antecedents and characteristics are important in the classroom?

Armed with a better understanding of the nature of the students and staff, the next area of interest to explore was finding out about the principles of adult education and what it is all about.

Profiling students

Think of the students in your classroom that you have in 2016. Develop a tool that could help you profile the students. Complete the form and write a summary describing the type of students that you have this year. Remember to include their social, economic, psychology, and other characteristics of the Namibian adult learner in higher education.

A questionnaire was designed around investigating the demographic, social features, economic situation, psychological characteristics of adult learners, possible learning barriers as well as the future plans of the students'. Under each heading, questions were developed from both literature reviews and anecdotal discussions. The questionnaire was emailed to 31 students in the Medicinal Chemistry I class (3rd year pharmacy students). Of these students only 18 responded.

Questionnaire – See Appendix 1

Results of 18 respondent's – See Appendix 2

Discussion

In terms of **demographics** (n=17), 14 females and 3 males responded, while one response was spoilt. The average birth year was 1994, which makes the average student approximately 22 years old. 88% (n=16) of the respondents are Namibian citizens and only one of the respondents speak English as a first language! The first language of most the respondents is Oshiwambo. This made me reflect a lot as I assumed that everyone understood what I am saying all the time in English! According to Halic et al. (2009), language and cultural identity are central to the academic experience of non-native speakers. For these students, it is very important to have a learner-centred instructional design to address the needs of these students.

I was also surprised that nearly 24% of the respondents were not raised by their biological parents. Having a sense of love or belonging (according to Maslow) is vital if self-esteem and self-actualisation are to be reached (Figure 2.1). A certain amount of love or belonging might (in some cases) be lacking is cases where one is not brought up by their own biological parents.

Most of the respondents have five other siblings – this is much higher than I might have guessed. The implications of this are that there might have been less money spent on each of the siblings during their upbringing. For example, it is very difficult (financially) for a normal family to send five siblings to expensive private schools.

In terms of the Namibian adult learner, these results are skewed in that none of the respondents are married or have children. This means that the students have a lot more time to focus of their studies. Looking after children obviously takes a lot of addition time and energy.

82% of the respondents described themselves as being religious, while the other approximately 18% indicated that they were sometimes religious. The significance of this finding is that some studies have shown that religious children perform better on most academic measures than their less religious counterparts (Jeynes, 1999).

The **social features** of the respondents showed that 41% of the respondents rented accommodation outside of UNAM, while 29% lived in student residence. Another 17% lived

with parents and a further 12% lived with other family members. Staying in student residence was very convenient to 29% of the students, as this location is just across the road from the School of Pharmacy. This means (for example) that 41% of the students have much further to travel and might be late for class if there is traffic.

94% of the respondents study alone, while only 6% study with friends. Both methods have advantages and disadvantages. 59% of the respondents admitted to partying a lot 'sometimes'. This vague answer was not sufficient to extrapolate meaningful insight.

Various kinds of peer pressure sometimes affects 29% of the respondents, but none of the students indicated that peer pressure was a continual problem.

I was surprised that as many as 53% of the respondents rely on taxis for transport, 23% simply walk, and only 23% own a car. Hence often being late for class...

Even more surprising was the fact that 41% of the respondents admitted to have been attacked or robbed in Windhoek during the course of their university studies! Examples of these events ranged from being threatened with a knife, being assaulted on campus, getting phones and bags stolen, muggings, held up with guns etc… Shocking stories! What is being done to assist the students with psychosocial trauma and stress at the university?

In terms of the students' **economic situation**, 47% of the respondents hold student bank loans while 23% have student bursaries. Only 18% are privately funded by their families.

Most of the students (76%) are not working and studying at the same time, however, 18% of the students have some part-time work. This means that those 18% who are working and studying have less time (or be more tired) to be able to apply themselves to additional study outside the classroom.

A staggering 29% of the respondents admitted to not having enough money to feed themselves every day. Only 23% of the respondents admitted to having enough money to feed themselves daily. While 41% of the students indicated that they had money for food most of the time (but not all the time). How can students learn or concentrate when they are hungry? The remainder of the students indicated that they had enough money to feed themselves daily. How are we doing to address this issue at the University of Namibia? According to Maslow's hierarchy of needs (Figure 2.1), hunger is a basic physiological

requirement. Unless the basic physiological needs of the students have been met, he/she will not be able to achieve some of the higher goals such as love, self-esteem and self-actualisation.

Despite all these difficulties mentioned above, the **psychological characteristics** of the adult learners is surprisingly upbeat. Most the respondents generally look on the bright side, most pay attention to details, and most feel other's emotions. The psychological characteristics of the students in the classroom seems to be healthy. The respondents know how to comfort others, they make friends easily and they remain hopeful despite all the challenges. In addition, they use laughter to brighten the days of others and they are interested in other people.

In terms of finding out more about **learning barriers**, the respondents admitted that English language (41%) and mathematics (59%) were not learning barriers. Clearly there is some room for improved here. Giving additional English and mathematics classes to first year students would therefore certainly be of assistance.

There was a trend to see financial constraints as a possible learning barrier, while transportation as a possible barrier was very evenly distributed from 'Yes' to 'No'.

Family responsibilities and commitments were reported to hinder about 50% of the class to some degree, but in spite of this, most of the class said they have families that actively support and encourage the respondents which is good news.

The **future plans** of the respondents see that 53% of the respondents plan to work in community pharmacies, while 29% in hospitals. 71 % of the respondents plan to stay in Namibia, while only 18% plan on leaving. This is good news for Namibia, as there is a shortage of pharmacists in Namibia ('Concern over pharmacist shortage,' 2016).

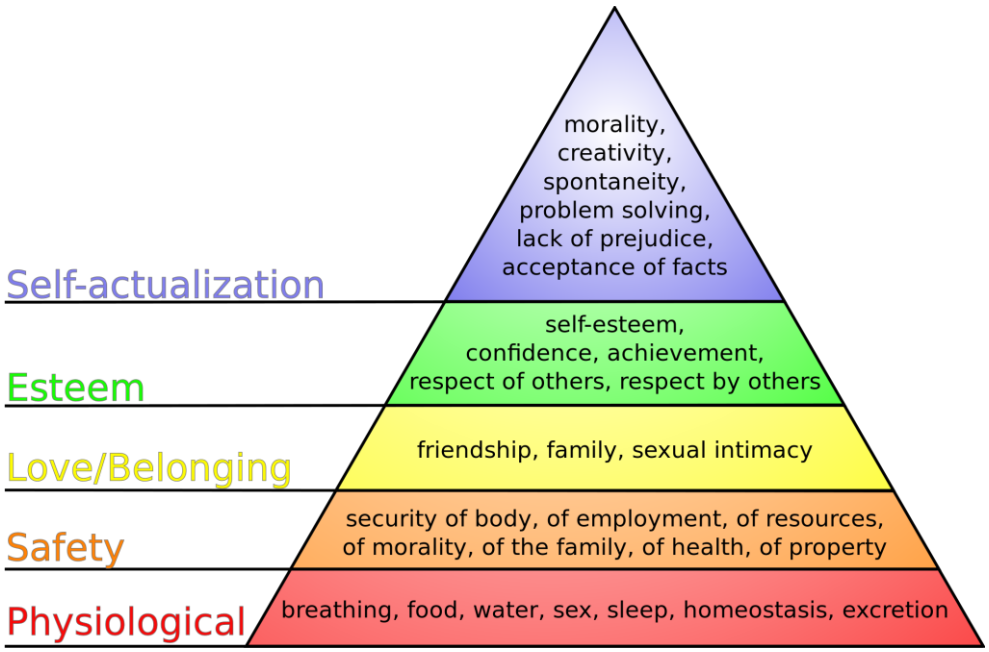

Figure 2.1 Diagram of Maslow's hierarchy of needs (Finkelstein, 2016).

These findings seem completely contradictory to Maslow's hierarchy of needs (Figure 2.1). How can most the students remain upbeat, positive, hopeful and caring if their basic needs are not being met? How can they use laughter to brighten the days of others and remain interested in other people under these conditions? As mentioned above, these students are struggling with food and safety and yet they are still attempting self-actualisation. This is to be applauded and even admired. A further study into this kind of Namibian resilience is certainly worth exploring in the future!

Conclusion

This study was very surprising to me. I learned a lot about my students as well as their needs and circumstances. I feel that I identify and respect my students much more now that I understand more about their life circumstances. Most surprising to me is their resilience. In spite of all the hardship and difficulty, they remain positive and happy about life. I also learned not to assume anything about the students before asking them.

Follow up questions

After profiling the students, the follow up question to the class was, 'What makes a good lecturer?' An informal discussion was had with the class and the following themes started to emerge from various earn students.

A good lecturer has a number of qualities, for example:

- Good lecturers are naturally able to motivate and engage with the students.
- Good lecturers are also able to develop relationships with students. For example they are willing to listen is there is a problem and they are able to assist or give good advice when needed.
- Good lecturers have a good understanding of who the students are. For example, he or she at least knows their names.
- Good lecturers are dedicated to teaching, research and community service.
- The lecturers are kind, caring and patient.

It became clear to me that many of these qualities one simply has, or does not have. For example, kindness, caring, patience, dedication and good relationships. How does one instil these virtues? They can be taught, but not instilled. Is one simply born a good teacher or can it be learnt? This of course brings up the old, 'nature' versus 'nurture' debate. How does one develop a good relationship with the students and help them learn better?

The results of this discussion were very surprising to me, as it became apparent that the lecturer's knowledge or teaching methods were not the main driving force behind what makes a good lecturer according to the class! What an eye-opener!

How could I benefit from this knowledge? It appeared that the class yearned for a more humanistic approach to education and that I would need to do more than simply deliver information or knowledge. Curzon (2004) was a humanist and recognised the importance of the students' personal values and the development of their positive self-concepts through an emphasis of feeling and thinking. As a result, I started asking the class questions about their lives and activities, which they greatly appreciated.

Typical kind of questions posed to the class were (for example);

- "What did you do this weekend?"
- "Did you sleep at least eight hours last night?
- "What did you eat for breakfast this morning?"
- "Are you safe at home?"
- "Please come and see me if you have trouble understanding the course material or other academic related issues…"
- "Please, I am patient, slow me down if we are going to fast?"
- "Please stop me whenever you want. Are any of these English words new to you? Do you know their meanings?"

In addition, I asked the class a lot more questions about the work covered to get them more involved and motivated in the classroom. I also tried to relate the theory being taught to practical examples which they had experienced during their pharmacy placements in industry, community or hospital. Carl Rogers noted that people learn best when the material is perceived as relevant (Curzon 2004), while the constructivist school of thought would say that tasks should be as authentic as possible (Jonassen, 1999).

These results were similar in some respects to findings at the University of Wisconsin. Students were asked to identify characteristics of effective teaching. The findings showed that instructors who were effective teachers were respectful of students, knowledgeable, approachable, engaging, communicative, organized, responsive, professional and humorous (Delaney et al., 2010).

However, I still needed more theoretical information on understanding the psychological basis and motivation of adult education. This led me to discover the principles of adult education below. How could this information be used usefully to form part of my own teaching and learning philosophy for my own students in the Namibian context?

Principles of adult education

Study and critique Knowles principles of adult learning and teaching and thereafter suggest your own philosophy that could be derived from other philosophers that critiqued Knowles' andragogic principles.

Study and critique Knowles principles of adult learning and teaching

Malcolm Knowles is famous for establishing five different core concepts associated with adult education and andragogy (and how adults' characteristics differ from those of children) (Figure 2.2). These factors are based on namely (Knowles, 1984):

a) Self-concept (As one grows into an adult one becomes a self-directed human who is not a dependent anymore.)
b) Experience (An adult has lots of 'real life' experience which contributes to his or her learning outcomes.)
c) Readiness to learn (Focussed on the developmental tasks of social roles.)
d) Orientation to learning (Adults focus on problem solving and immediate application of knowledge.)
e) Motivation to learn – *which was added at a later stage* (Adults have internal motivation to learn.)

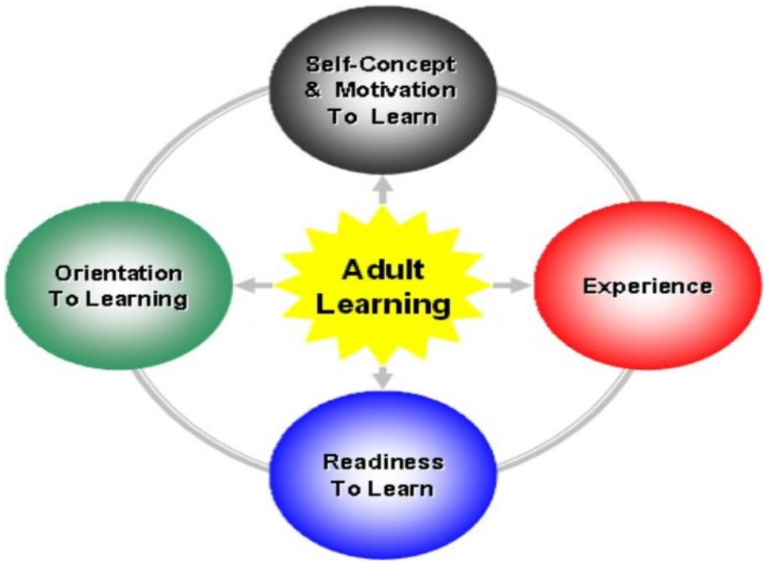

Figure 2.2 Core concepts associated with adult education (Knowles, 1984) (Miroballi, 2010)

These fundamental differences between adult and child learning have been subject to much debate and critique, as one would expect when making generalizations about the characteristics of adult learners (often without taking into consideration their life situations or practical circumstances) (Smith, 2010). Useful critiques of this concept can be found in Smith (2010).

For example:

Looking at point '*a*' above, what does it mean to be self-directed? Is this a possible definition of adulthood? This is a grey area as certain children also display self-directed behaviour and in addition this self-directed behaviour depends on different cultures.

Point '*b*' implies that because adults have experience, they will be better learners. This is not always the case, especially when large amounts of new information is required. This raises the question, what are we trying to teach? Some argue that age and level of experience makes no educational difference (Smith, 2010), this of course seriously damages the theory that adults and children learn differently.

It has been argued that point '*c*' is unfounded and that there is little reason to assume that as people develop, their readiness to learn becomes more oriented to the developmental tasks of his or her social roles and that this has an effect on the process of learning (Smith, 2010). According to this, adult learners are more likely interested in just life application learning skills, which is obviously not always the case.

Point '*d*' is based on the premise that as a person matures, he wants to apply his knowledge immediately and he wants to solve problems. Therefore, how do you account for adults that learn simply because they are fascinated or interested in a particular topic? An argument can also be made that perhaps adults are more patient than children and can stand delaying applied knowledge more than children?

Point '*e*' states that as a person matures, his motivation to learn is internal. However; an adult might not have internal motivation to learn if he is starving and unable to feed his family.

Based on the above mentioned findings, Knowles (1984) and Kearsley (2010) go on to further suggest that the following should be applied when teaching adult learners:

a) Adults need to be involved in the planning and evaluation of their instruction.

b) Experience (including mistakes) provides the basis for the learning activities.

c) Adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life.

d) Adult learning is problem-centred rather than content-oriented.

According to Mbukusa (2016), therefore, adults are therefore characterized by maturity, self-confidence, autonomy, solid decision-making, and are generally more practical, multi-tasking, purposeful, self-directed, experienced, and less open-minded and receptive to change. As a result, the following teaching methods are suggested to be tailored to the needs of adults:

a) Self-directed learning

b) Experiential and/or situated learning

c) Learning to learn

d) Critical Reflection

Adults involved with Higher Education learning must therefore be treated in a different way to children. For example, the lecturer should manage or facilitate learning (and not directly spoon-feed information to the students). The lecturer should also use the experience of the students to the advantage of the other students (for example, sharing 'real life' experiences in the classroom will benefit everyone). Prior learning (in adults) also needs to be explored as a possibility for additional recognition or credits. In addition, often adult learners don't always need to be bound to a campus or a semester, they are often very well suited to long distance learning at the workplace (Mbukusa, 2016).

Andragogy and pedagogy

A comparison of Knowles' versions of pedagogy and andragogy can be seen below in Table 2.1.

Table 2.1 A comparison of the assumptions of pedagogy and andragogy (following Knowles principles) (Smith, 2010).

	Pedagogy	**Andragogy**
The learner	*Dependent.* Teacher directs what, when, how a subject is learned and tests that it has been learned	*Moves towards independence. Self-directing.* Teacher encourages and nurtures this movement
The learner's experience	*Of little worth.* Hence teaching methods are didactic	*A rich resource for learning.* Hence teaching methods include discussion, problem-solving etc.
Readiness to learn	*People learn what society expects them to.* So that the curriculum is standardized.	*People learn what they need to know.* Learning programmes organised around life application.
Orientation to learning	*Acquisition of subject matter.* Curriculum organized by subjects.	*Learning experiences should be based around experiences.* People are performance centred in their learning

My own philosophy derived from others that critiqued Knowles' andragogic principles

It is important to remember that when generalisations are made, such as Knowles' andragogic principles, there are always going to be exceptions. People are individual and highly variable. Knowles (1984) makes some good 'assumptions' about adults, but as seen above, these are all subject to critique at a certain level or circumstance. Learners are more than simply adults or children, for example, some adults behave like children (and *vice versa*). The science of andragogy and pedagogy is very interesting, but in many cases it is over simplified. One needs to take account of the fact that this model has many exceptions but can still be a very useful guide to understanding adult students in the classroom.

Was I even close to being in a position whereby I could understand or feel what my students were going through? How did my experiences as a student compare to that of my current students and what could I do to try and bridge the gap? I began to think about this important topic…

What barriers affected you as you entered higher education (as a young adult). Compare your barriers to those of your students and suggest how such barriers could be overcome citing numerous examples from your teaching and learning.

As a young learner adult I was fortunate enough to be well supported with all the *practical aspects* of learning such as finance, language, access to information, no caring responsibilities and access to transport.

In terms of *social* and *cultural barriers*, I was also fortunate enough to have no significant peer pressure or cultural barriers to overcome.

There were also no *workplace barriers* during my studies as I did not have to work during this period. I was in a very privileged position indeed when I studied.

My main barriers were *emotional* such as a lack of self-esteem or confidence – I honestly believed that I was truly going to fail every exam. These feelings were of course irrational as I normally did very well in every exam. These feelings were linked to anxiety and stress, which I had to deal with in order to learn and succeed at university. Anxiety and stress are barriers to learning as one cannot learn or process information if one is too anxious. Typically in my exams, I would do very poorly at first, and very well at the end of the paper

as I learnt to relax. Recognizing these issues and dealing with them was not easy, but was key to my success at university. I managed this condition by exercising; yoga, squash, swimming, sailing and travelling.

I recognize the fact that when I lecture a group of students, they might have one or many of some of the barriers mentioned above. It is my duty to understand their barriers whatever they might be and help and assist the student in overcoming their barriers to learning. Things which I often take for granted might be incorrect. For example, it is wrong to assume that everyone even understands what I am saying, as the vast majority of my students are not even first language English speakers. The first language spoken in my class is Oshiwambo, a language I know nothing about!

In addition, in many instances I am unable to even relate to the students' learning barriers, for example, some students can't even afford food for the day. How is one supposed to learn or concentrate on a hungry stomach? In addition, it appears that we are not living in a safe environment as 50 % of the students have experienced some form of violence or theft against them which can be traumatizing and very stressful to the learners.

Accommodating all the students as well as their barriers to learning is a challenge which needs to be met in order to be a successful lecturer. One of the strategies I use is communication… I simply ask the students what their barriers are; and try and solve one barrier at a time.

If the trouble is language, I speak slowly and ask the class lots of questions. Or I get a student to read the slides and I quiz the class to make sure they understand the work.

If the students don't understand the work, I encourage class discussions, often when one student explains the work to the class the students seem to understand better. I was surprised to discover that nearly all the students learn alone, instead of benefitting from the effects of learning together and exchanging ideas.

In addition, I encourage the students to visit my office so that they can discuss their studies. I also use this opportunity to try and motivate the students.

To give personal attention to the students, I like to learn the names of all the students in the class, as well as where they come from and what they want to do with their lives so that we can relate and understand each other better.

I am lenient on students who are unable to attend all my lectures, as I understand that sometimes it is just not possible to attend a class, due to other responsibilities, such as family and work. For example, most of the students walk to the Faculty of Health Sciences, and very few of them have access to a car. It is about balance, one cannot just attend to one matter without other factors suffering too… The first step to helping students with learning barriers is being aware of what they might be. Barriers to learning are not absolute, instead they are relative to the person experiencing the barrier, and one should not pass judgement about another person's barrier. Barriers need to be understood and worked on without prejudice or judgment.

Was I thinking about things correctly? Thinking can be fairly disorganised in itself. Am I even asking the correct questions? I learnt that I should be reflecting instead of thinking. But what is reflection all about? How could I use reflection as a means of improving my lessons in medicinal chemistry?

*Reflect on the module that we have covered and formulate **four questions** that you felt 'talked' to your current practice and suggest how you could improve your practice for better.*

The importance of reflective practice and various reflective practitioner's such as Kolb (1984) (Figure 2.3) and Schön (1987) was of particular importance and interesting. They suggest that learning is cyclic, it does not end. It is ongoing and involves thinking honestly, deeply and critically about all aspects of professional practice. It is spontaneous and essential and leads to action. It is very useful for health professionals who want to carry on learning throughout their lives. The act of reflection is a great way to increase confidence and become a more proactive and qualified professional.

The developmental spiral Dewey (1933) involves; experience, reflection, conceptualization and experimentation (and this spiral repeats itself again and again) (Figure 2.4).

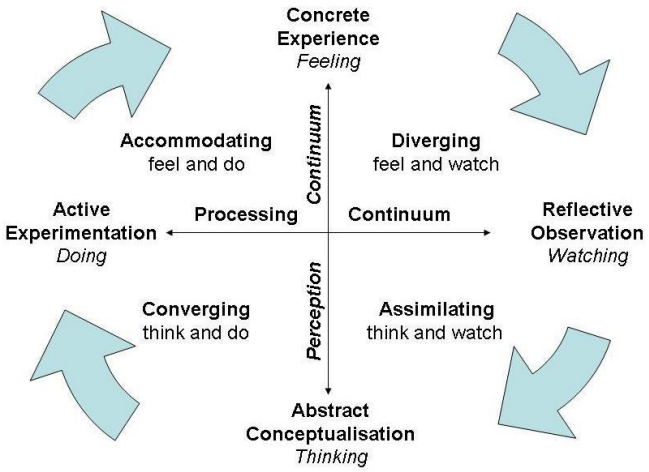

Figure 2.3 The process of reflective practice by Kolb (1984)

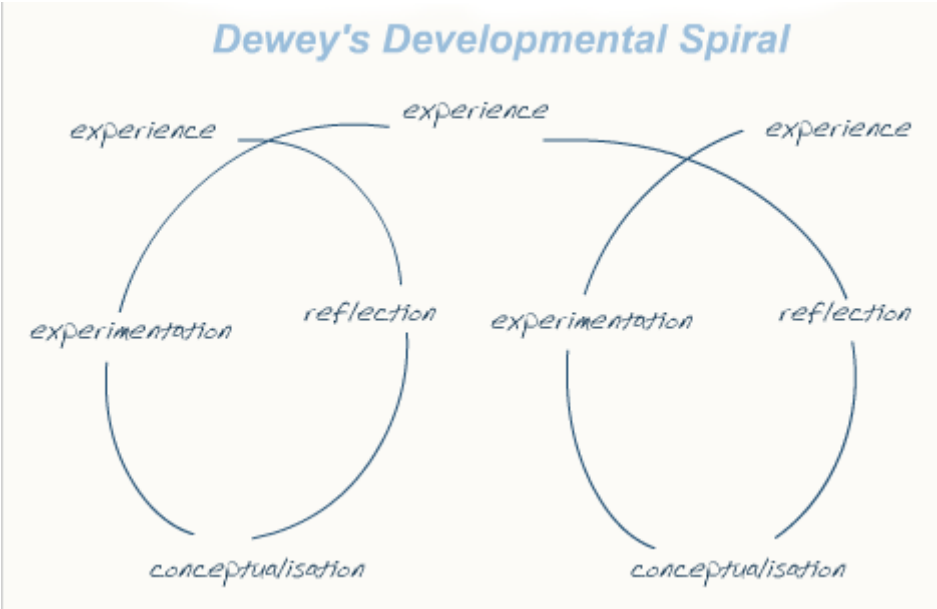

Figure 2.4 Dewey's developmental spiral (Slesser et al., 2006)

This lead to the obvious question; how could I become a better lecturer through successful reflective practice? What topics of reflection are important to my lecturing at UNAM? For example:

1) What experience is required to be a great lecturer *versus* what experience do I have?

2) How does my view of the world (as well as my circumstances) compare to that of my students views and circumstances?

3) What is the social context of adult learning in Africa?

4) What is the best approach to responding to adult learners in higher education?

After using Kolb (1984) and Dewey (1933) reflecting models, I was able to conceptualise new ideas that I could experiment with and later assess the impact of it on my lecturing.

1) In order to expose myself to other teaching styles, I decided to attend other lecturers to see if I can learn from experts in the field who have got much more experience than me. I also asked the students what they think makes a good lecturer (pg. 25). In addition, useful insight was also gained from the literature (Su et al., 2012). The findings of this article indicate that, '… from students' perspectives, a combination of the lecturer's subject knowledge, willingness to help and inspirational teaching methods makes a good university lecturer. Being humorous and able to provide speedy feedback were also perceived as important factors. These findings have some important implications for academic practice.' (Su et al., 2012)
Interestingly, according to Kember and Kwan (2002), 'Lecturers who conceived teaching as transmitting knowledge were more likely to use content-centred approaches to teaching while those who conceived teaching as facilitative tended to use learning-centred approaches.'

2) These questions were already addressed above (pg. 31-33).

3) The Social Context of Adult Learning in Africa by Indabawa and Mpofu (2006) is a very interesting read and covers topics such as adult education and development, social change and development, community and adult education, race, ethnicity, religion, social class and gender, empowerment, democracy, health and HIV/AIDS, poverty and debt, as well as globalisation and the environment. I concluded that

Africa is very different to the rest of the world and we need to understand the African context as a means to working and functioning better within the environment that we live in.

4) Responding to Adult Learners in Higher Education (Kasworm et al. 2002) covered important topics such as:

a) Adult students: Who are they and are they different?
b) Recruiting and retaining adult students: What is important to them?

Only by understanding who is it that we are teaching can we become better educationalists. Much of how adults differ to children was already covered when Knowles was discussed above. Reflection is very useful and beneficial to my work at UNAM as a lecturer and should form a compulsory part of every UNAM staff member's daily work.

For example, after learning about Knowles (1984) and Kolb (1984) it was clear that I had to implement additional self-directed learning as well as experiential and/or situated learning followed by critical reflection in the subject of medicinal chemistry. This was done by giving the students more self-directed learning in both the library and on experiential placements in both community pharmacies and industrial placements. Curzon (2004) and Jonassen (1999) (as already mentioned above) are leaders in the field for this kind of constructivist learning.

In addition, I had to involve the learners more in the planning and evaluation of their instruction. This was done through consultation with the class and senior management. In the end we all agreed that it should look as follows for medicinal chemistry (Table 2.2) (See Appendix 3):

Table 2.2 Evaluation methods used in Medicinal Chemistry

Continuous Assessments	**(60%)**	**Exam Assessment**	**(40%)**
Course assignments (x 3)	15%	Final Examination (written)	100%
Written tests (x 3)	60%		
Practice labs (x 10)	25%		

As experience (including mistakes) provides the basis for the learning activities, the class was encouraged to share their experiences with one another. For example, after a chemistry practical, we would discuss what went right and wrong with each group. This helped certain groups learn from the success or mistakes of other groups. Generalised feedback can be beneficial in terms of learning from others and seeing how well you performed in relation to your peers (Rowe & Wood, 2007).

The students were also given some room to discuss what they thought was important to know in the workplace. Adults are mostly interested in learning about subjects that have immediate relevance and impact to their job or personal life (Knowles, 1984). As a result, the class decided on an assignment that was to learn about the chemistry, pharmacology, preparation and uses of various medicinal indigenous Namibian plants. This topic had previously been largely ignored in the Bachelor of Pharmacy syllabus.

In addition, I changed the focus of medicinal chemistry from content-orientated to problem-centred (Jonassen, 1999). which the students found much more interesting than simply learning chemistry for the sake of chemistry. For example, on the board we can see the mechanism of penicillin binding to gentamicin. How can knowledge of this chemical mechanism (Figure 2.5) below be relevant to a patient lying on a bed in hospital?

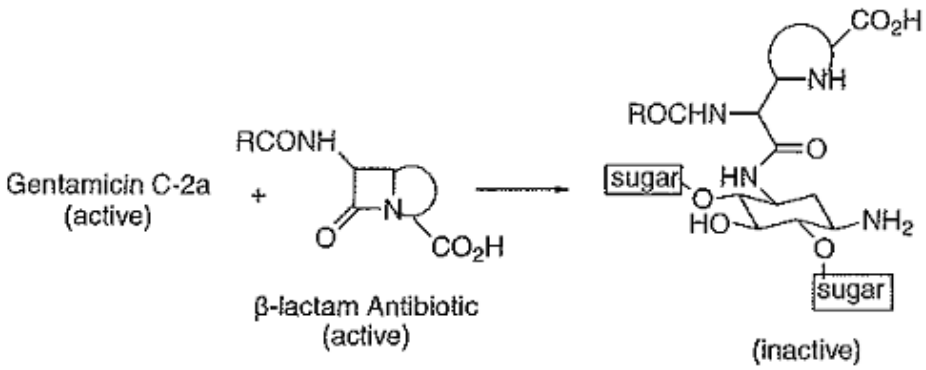

Figure 2.5 Gentamicin binding to penicillin (causes a cloudy precipitate in the infusion bag and the resultant compund is no longer pharmacologically active - avoid this drug-drug interaction) (Lemke, 2013).

Or what is the implication of the following mechanism (Figure 2.6)?

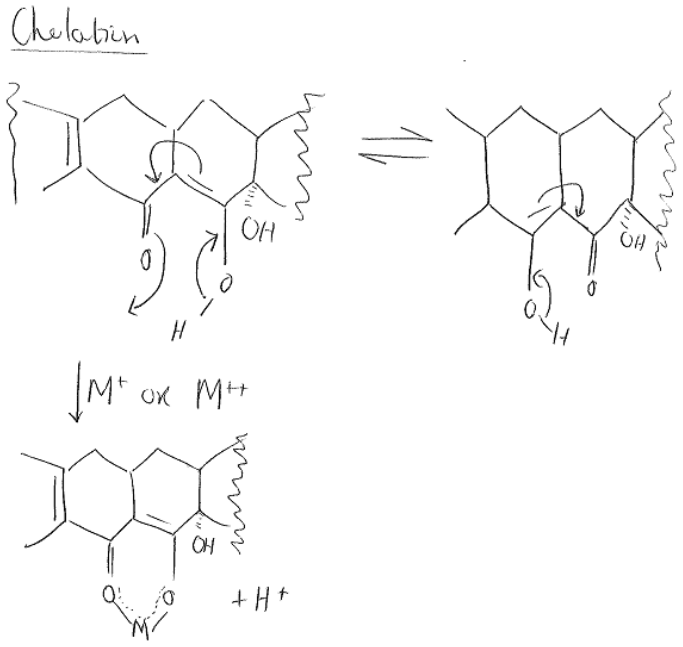

Figure 2.6 Tetracyclines should not be taken with antacids (as they chelate with tetracyclines and the resulting complex is not absorbed in the stomach.)

Conclusion

This chapter on learning about my students and adult education at a tertiary institution in Namibian was very useful to me and the way I teach. It taught me a number of useful educational concepts and skills. As a result (as can be seen above), the findings from this chapter lead me to make several changes to the way I had been previously thinking and doing things in the classroom.

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Chapter Three

What is a curriculum and how can I improve the curricula?

In order to demonstrate skills in curriculum design and development in Higher Education the following assignment was undertaken:

Taking into account what you have learned in this module, write an assignment in which you describe your role in relation to curriculum design and development in your institution. Articulate what you would like to see changed in curriculum development practices in your institution at macro and micro levels (at all levels) appropriate for your institutional type (and for a university in Africa).

My role in relation to curriculum design and development is limited, as I was handed the outline of a product which needed to be delivered, therefore, my role in the initial macro settings was minimal. However, I do play an active role is the development of the module guides for the subject, Medicinal Chemistry (curricula at a micro level) (See Appendix 3). When these modules guides were written I had no idea of what Blooms learning taxonomy (Reece & Walker, 2006) or even what alignment was all about! Assessment was simply based on my undergraduate experiences at Rhodes University. The course material had not been decolonialised or recontextualised. I did not have an idea of where the students in the class even came from. It was only after several discussions in class that I began to slowly see the bigger context of my purpose at the university. Therefore, as none of these factors had been taken into consideration, I would argue that the Medicinal Chemistry modules that I oversee are in drastic need of reworking in order to be more appropriate for the students and institution in which I work.

Analyse your institutional context in relation to curriculum

The University of Namibia is a public university. Other examples of institutions in Namibia are private or Technicon's. It is found that often the institutional type determines the type of curriculum that will be adopted. Different types of curriculum include, for example; subject curriculum, teacher centred curriculum, learner centred curriculum, activity/experience

curriculum and integrated curriculum. I would argue, that the current Bachelor of Pharmacy curriculum makes use of all these types to varying degrees, often depending on the particular subject which is being taught. For example, subjects such as pure science which contain a lot of theory might make use of a subject centred approach, while subjects such as soft or social science might use more of a learner centred approach. As the Bachelor of Pharmacy degree is very broad and diverse, a number of different curriculum types need to be adopted to accommodate all of the various subjects being taught. It is not possible to group the whole curriculum into just one type of curriculum style, as there are so many inter-subject variations to take in consideration.

In Namibia, there are various national structures which contribute to the framework and policies of various educational programmes in the country. The Ministry of Education is responsible for the provision, monitoring and evaluation of education programmes. The National Institute for Educational Development provides in-service training and curriculum development, while the Namibia College of Open Learning provides distance and informal education. UNAM, for example, is responsible for professional or academic training and research within the context of Education for All (EFA) in Namibia. UNAM is just one part of a bigger picture, other institutional structures which also contribute to the implementation of EFA in Namibia include, for example; the National Youth Council, Council of Churches, Community Learning and Development centres, the UN system in Namibia, Ministry of Trade and Industry, Ministry of Women Affairs and Child Welfare etc.…

Curriculum development within the institutional context of UNAM is influenced by the vision, mission and values of the university. These also include the dominant ideas, beliefs and values of the university and are listed below as follows (Hangula, 2014).

Vision

To be a beacon of excellence and innovation in teaching, research and extension services.

Mission

To provide quality higher education through teaching, research and advisory services to our customers with the view to produce productive and competitive human resources capable of driving public and private institutions towards a knowledge-based economy, economic growth and improved quality of life.

Values

- Professionalism
- Mutual respect
- Integrity
- Transparency
- Equity
- Accountability

The School of Pharmacy is dedicated to the vision, mission and values of the university (as mentioned above). These values are on a board as you enter the School of Pharmacy for everyone to see. The mission and vision of the university are vital in providing the direction for the underpinning of all the activities which take place at the School of Pharmacy. As a result, from first year (and onwards), lecturers should ideally be consistently teaching the core values (as mentioned above) to all the students involved. In the future, these students will become ambassadors of the university and this value system is very important in sustaining a successful and healthy Namibian society.

In addition, the School of Pharmacy aspires to have what is known as '7 star' graduates with the following qualities (Rennie, 2015):

- Care Provider
- Decision-maker
- Communicator
- Leader
- Researcher and life-long learner
- Teacher
- Manager

As a follow on from this, the key objectives for the School of Pharmacy are as follows (Rennie, 2015):

The key objectives of the School of Pharmacy are:

- To promote equity of access to health care services for all;
- To promote affordable health care service delivery by strengthening health care systems that are sustainable, cost-effective, efficient, culturally relevant and acceptable;
- To institute pharmaceutical care measures to counter major health risks including the prevailing communicable diseases;
- To develop academically and professionally qualified pharmacists in sufficient numbers to support the health care infrastructure of Namibia;
- To conduct research directed to the health care needs of the Namibian society at large, and which is instrumental in ensuring quality health care service delivery;
- To utilise the natural resources available and the skills and research generated in producing commercially viable quality pharmaceutical products.

It is a combination of both the '7 star pharmacist' attributes and the key objectives for the School of Pharmacy, as well as the vision, mission and values of the university which influence curriculum development within the UNAM institutional context.

Curriculum transformation and decolonialisation are being addressed at UNAM in varying degrees. For example, we are encouraged to recontextualise information to suit the Namibian setting as well as address Namibian problems with Namibian solutions. Namibia is encouraged to rely less on outside intervention and be more accountable for itself and its' action. For example, the Bachelor of Pharmacy programme is unique in that the curriculum has been designed in such a way that UNAM pharmacists are very well equipped to deal with Namibian healthcare issues such as HIV/AIDS, malaria and TB. Priority or emphasis is intentionally placed on these topics during the students' undergraduate years. The notion that Namibians must use knowledge to liberate themselves instead of colonializing themselves with solely Western ideas and solutions has become very important.

The Bachelor of Pharmacy curriculum was not completed by just one individual. The development process was lengthy and very well researched by numerous key stakeholders. For example, exhaustive consultations were held with with external pharmacy stakeholders from; industry, Ministry of Health, hospital and community, USAID and the Health Professions Council of Namibia (HPCNA), to name a few. These agents met with academic developers to build the processes and practices which are now represented by our current day pharmacy curriculum.

Institutional curriculum development practices

This involves a number of key concepts, such as: curriculum responsiveness, curriculum paradigms/perspectives and understanding the purpose of higher education. In addition to this, in order for a curriculum to serve the needs of the Namibian public, the curriculum must be successfully aligned, decolonialised and recontextualised.

One dominant feature of successful curriculum development (at the moment) is simply understanding the purpose of higher education.

Purposes of higher education

Higher education contributes to social and economic development by increasing the level of cognitive skills throughout society (Luckett, 2001). The challenge is to integrate generic skills into a traditionally content-based curriculum. According to Luckett (2001), all four ways of knowing and learning are needed for this to be successful. These are the traditional cognitive learning of propositional knowledge; learning by doing for the application of disciplinary knowledge; learning experientially and fourthly developing epistemic cognition so as to be able to think reflexively and contextually about one's learning (Luckett, 2001).

Using this approach generic skills (both transferable and transferring) can be best integrated into the curriculum. All curricula should lead to some area of specialisation or career field which can provide a context for the application of knowledge learnt and for the performance of appropriate practical tasks. A curricula should address both local and global dimensions and should be epistemically diverse in order to serve the purposes of higher education (Luckett, 2001).

All pharmacy students are encouraged to actively participate in the healthcare needs of the country and to make full use of their cognitive and practical skills for this purpose. This is done through community placements, hospital placements, pharmaceutical industry placements, one year pharmaceutical internships and soon compulsory community service with also be introduced. These students are highly employable and will contribute to improving the healthcare of Namibia as well as the country's economy. This area of higher education and pharmaceutical specialisation is a niche that will certainly benefit all Namibians in the future.

Curriculum responsiveness

Curriculum responsiveness gives us a bench mark from which we can determine whether our courses are meeting the needs of a transforming society (Moll, 2004).

For example, is X responsive to Y by doing Z?

In this case X is the university curriculum and we are interested in various substitutions for the other two terms, Y and Z of the frame that are apparent in the debates that discuss 'curriculum responsiveness'. In addition, several different kinds of curriculum responsiveness exist, for example:

Economic / policy responsiveness asks the question, are sufficient numbers of qualified personnel being trained in key sectors of the economy? This refers to labour market responsiveness, 'the market' (i.e. industry, government, the service sector, even the informal sector) sends a definitive message to higher education that it requires it to produce skills. These skills are not just qualifications that are practical, but must also emphasise flexibility and effectiveness and provide enough knowledge to enable employees to learn and increase economic competitiveness (Moll, 2004).

Important questions to ask regarding responsiveness include, for example:

- How responsive is UNAM in effectively addressing the challenges in training sufficient numbers of qualified professionals for both the industry and government?
- What are models of 'best practice' that can guide schools and industries desiring to work together more effectively?
- What policy changes can facilitate greater responsiveness between higher education and industry?

Institutional / cultural responsiveness examines how cultural dissonance between teachers and ethnically diverse groups contributes to school failure (amongst other things). Cultural responsiveness may encompass responsiveness to gender, acknowledgement of cultural heritage, different socio-cultural realities, and incorporation of multiple cultural resources and materials in all the subjects and skills routinely taught in schools. Cultural responsiveness has a dual purpose; it relates to the work as educators and the way they articulate and research their own knowledge disciplines (Moll, 2004).

Knowledge discipline responsiveness looks at whether a good teacher keeps up to date with the latest developments within the profession.

Learning responsiveness examines the learning needs of the students by teaching them in terms that are accessible to them and assessing them in ways that they understand (Moll, 2004).

How do these four senses of 'curriculum responsiveness' compare to what is observed at the UNAM School of Pharmacy curriculum?

At the moment, three cohorts of pharmacy students have graduated from the School of Pharmacy. In 2014 there were 14 graduates, in 2015 this number was 15, while in 2016 this number more than doubled to 36 graduates. This is a major accomplishment for the country as a whole. All of these graduates are currently employed, either as qualified pharmacists or still completing their pharmacy internships. In terms of labour market responsiveness, Namibia has a major shortage of pharmacists, so producing our own pharmacists is a big step in the right direction. UNAM can therefore say that it is responsive in addressing the challenges of training qualified professionals for the industry. Industry itself places a very important role in curriculum design (Clarence-Fincham, 2013), however industry itself is by no means a homogenous body with unified expectations and needs. However, UNAM is still working on getting sufficient numbers of pharmacists to serve the critical shortage that the healthcare system faces. In terms of models of 'best practice' that can guide schools and industries desiring to work together more effectively, the School of Pharmacy has regular interactions with pharmacists in hospital, community and industry. Feedback from external stakeholders has been extremely positive and encouraging. The Namibian people are very happy with the Bachelor of Pharmacy product which has been tailored to the needs of the country. Policy changes are already in place to facilitate greater responsiveness between higher education and industry, for example, the Ministry of Health and Social Services (MoHSS) plans on implementing compulsory community service for all pharmacists in order to uplift the national healthcare system by increasing the numbers of qualified pharmacists in rural or remote areas of the country. Therefore, before a pharmacist can become fully registered and work in the private sector (which pays better than the public sector), he/she must complete a year working for the state sector (after his/her pharmacy internship). In addition, in terms of responsiveness, curriculum review takes place every four years, so that the curricula can be tweaked or aligned with the national needs of the country.

In terms of Institutional / cultural responsiveness and to meet the needs of the people, there is an emphasis on solving Namibian health related problems such as HIV/AIDS, malaria and TB (tuberculosis) within the curriculum of the Bachelor of Pharmacy degree. For example, for the subject, Medicinal Chemistry, we focus more on drugs molecules related to HIV/AIDS, malaria and TB than any other group of pharmacologically active compounds. A similar emphasis is also seen with other pharmacy related disciplines such as pharmacy practice, pharmaceutics and pharmacology. This intentional bias has been made to educate and treat the healthcare needs of the Namibian people.

Good teaching keeps up to date with the latest developments within the profession. To address this, numerous experts in the field of pharmaceutical science and pharmacy practice often visit the School of Pharmacy and deliver excellent presentations. Attendance at these presentations also counts for CPD (Continuing Professional Development) points. In addition, the School of Pharmacy library is modern and up-to-date. Both these factors greatly assist the lecturers in keeping abreast of the latest developments within the pharmacy profession.

Learning responsiveness is another important factor to consider. It is well-known that the majority of the students are not first language English speakers and that they do not have lots of money for books or even food. As a result, lecturers know to speak slowly and audibly during lectures. In addition, the library contains sufficient textbooks for each student. To boost learning resources, the university also issues each students with free internet access (for as long as they are registered students). Students are assessed in ways they understand, as this is clearly spelt out in the module guide for each subject.

Curriculum paradigms/perspectives

This involves examining the product, process and praxis of the curriculum as a paradigm in relation to both the students and the society in which we live. There are three different kinds paradigms of curriculum theory, namely the; traditionalist paradigm, the hermeneutic (or interpretive) paradigm and the critical paradigm. These different approaches may also be viewed as three 'knowledge-constitutive interests'. For example, technical (empirical-analytic) interest, the practical (historical-hermeneutic) interest and the emancipatory (critical) interest (Luckett, 1995). These different areas constitute the shape and determine what counts or constitutes as knowledge. Values and ethical choice determine the best approach to take. When considering various modes of delivery, one needs to consider the

type of interaction taking place, for example; learner-teacher interaction, the learner-material interaction and the learner-learner interaction. For example, content knowledge can preferably be transferred after an initial introductory teacher-learner interaction, and knowledge can be transferred effectively through a learner-materials interaction. Therefore, it has been argued that during precious contact time, the teacher-learner interaction should not solely be used to transmit and explain content (Luckett, 1995).

The School of Pharmacy curriculum has responded to this by introducing Moodle and Panopto to the lectures. Lectures are encouraged to record their lectures for the students to watch in their own time *via* the Moodle platform. This gives the lecturer more time to discuss other matters which are relevant to students completing a pharmacy degree. Pharmacy students are also exposed to a number of placements in which they work in various locations such as community, hospital and industry. These placements are of great assistance to both the students learning and outlook of pharmacy related matters.

The relationship between knowledge and disciplinary field structures and curriculum development

Epistemology is the study of knowledge. In an overly simplified sentence, this discipline attempts to answer two main themes or questions. For example, on what basis can we fail someone or say that their understanding and comprehension of a topic is insufficient? How much can or should we know for a particular subject?

Claims that epistemic power often masks various forms of social power and domination have been made (Maton, 2013). But what are knowledge structures that affect this claim? Knowledge structures are derived from Bernstein's theory of education (Maton, 2013). In this work Bernstein analyses curricular and pedagogic practices in educational fields in terms of 'classification' and 'framing', through an account of the construction of educational knowledge in terms of the 'pedagogic device' to study the intellectual fields from which knowledge is selected and pedagogized in terms of 'knowledge structures' (Maton, 2013). Bernstein offers different concepts for analysing intellectual fields (knowledge structures) and educational fields (classification and framing).

There are different kinds of knowledge structures for different professions or topics. For example; horizontal discourse (which is everyday common-sense knowledge) and vertical

discourse (which is scholarly or professional knowledge). Within vertical discourse there exists both horizontal knowledge structures and hierarchical knowledge structures. Humanist culture (or Bachelor of Arts subjects) according to Bernstein are defined as having a horizontal knowledge structure. Whilst, science culture was described by Bernstein as having a hierarchical knowledge structure (Maton, 2013).

The relationship between knowledge and disciplinary field structures and curriculum development in the Bachelor of Pharmacy program does take into account the knowledge structure of the discipline. As the Bachelor of Pharmacy degree has a science background, one would expect the course to follow a hierarchical and vertical knowledge structure. Typically, the degree starts off in first year with a broad base of basic sciences and then progresses into a narrower more specialised field of advanced pharmaceutical science in subsequent years. First year has an extensive base of scientific information, onto which more specialised topics in pharmacy are slowly built on top of. This demonstrates the hierarchical nature of the scientific degree as stipulated by Bernstein. To further emphasise the nature of this hierarchical structure, the Bachelor of Pharmacy degree has a number of prerequisites. For example, you can't study subjects in fourth year, unless you have completed prerequisite subjects in third year etc. Below, see academic advancement rules below from the School of Pharmacy prospectus (Rennie, 2015).

ACADEMIC ADVANCEMENT RULES

FIRST YEAR TO SECOND YEAR OF PHARMACY

A student must have passed at least 12 of the prescribed First Year modules (192 credits) to register for Second Year modules. If any of the failed modules is a pre-requisite for a Second Year module, the student cannot register for the affected Second Year module until the pre-requisite is passed.

SECOND YEAR TO THIRD YEAR OF PHARMACY

A student must have passed **ALL** the prescribed First Year modules. In addition, the student must have passed at least 11 of the prescribed Second Year modules (408 credits). If any of the failed modules is a pre-requisite for a Third Year module, the student cannot register for the affected Third Year module until the pre-requisite is passed.

THIRD YEAR TO FOURTH YEAR OF PHARMACY

A student must have passed **ALL** the prescribed First Year and Second Year modules. In addition, the student must have passed at least 13 of the prescribed Third Year modules (656 credits). If any of the failed modules is a pre-requisite for a Fourth Year module, the student cannot register for the affected Fourth Year module until the pre-requisite is passed.

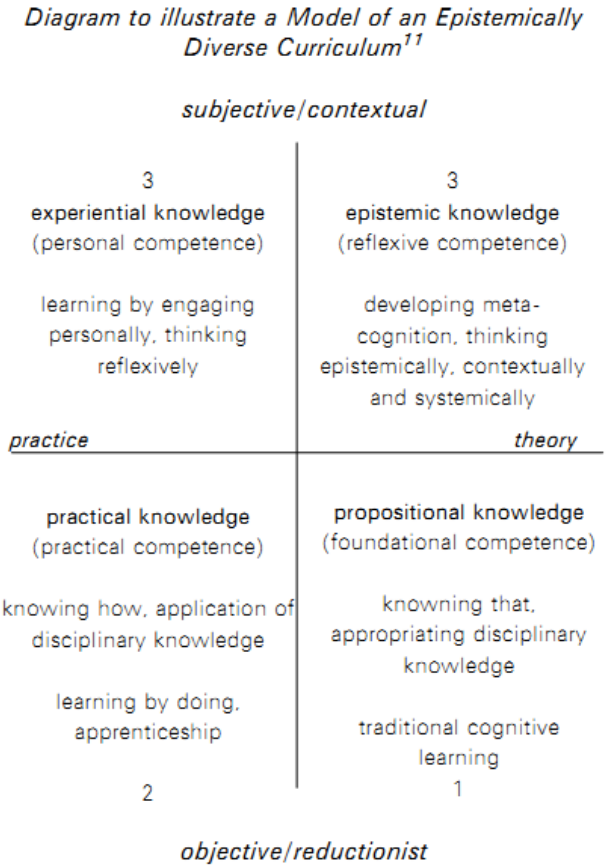

Figure 3.1 The four different kinds of knowledge according to Luckett (2001)

According to Luckett (2001), there are four different kinds of knowledge (Figure 3.1). Propositional knowledge is normal traditional cognitive learning which takes place in the classroom (quadrant 1). Learning in quadrant 2 involves practical competence. This involves learning by applying the knowledge learnt in quadrant 1 and 'doing' in quadrant 2. In this instance, pharmacists in training have a number of practicals (within each subject) to consolidate the knowledge learnt in quadrant 1.

The movement from quadrants 1 and 2, (where the HE curriculum has traditionally operated), into the ways of knowing represented in quadrants 3 and 4 is crucial according to Luckett (2001). After completing the 4 year Bachelor of Pharmacy degree, students must undertake a one year internship year before they can be registered with the Health Professions Council of Namibia (HPCNA). This is an example of quadrant 3 or experiential learning. Here pharmacy graduates work in real pharmacies under the supervision of a registered

pharmaceutical tutor. This is an example of a pedagogical relationship of mentorship, which is a facilitator and mediator rather than an instructor. Here pharmacy graduates learn by engaging personally and thinking reflexively. In addition, students learn to take responsibility for their own learning.

Quadrant 4 is the most intellectually demanding of the 4 ways of knowing. Metacognition, or an awareness of how and why one thinks and learns as one does, is emphasised. In addition, epistemic cognition, or the capacity to think epistemically, to recognise and evaluate the assumptions and limits of theories of knowledge and to be able to suggest alternative, is also emphasised. As a lecturer at the School of Pharmacy, I believe that to be a good lecturer, I need to operate in quadrant 4 in order to transfer important pharmaceutical skills to others. However, in most cases, quadrant 4 is at a Masters or PhD level and therefore many of the graduates do not experience this final step in the liberation of the epistemically diverse curriculum (in my opinion).

The curriculum certainly takes the Namibian context into consideration. From a theoretical perspective, the curricula has an emphasis on addressing and treating Namibian health related problems such as malaria, HIV/AIDS and TB. From a practical perspective, students are sent on placements to learn in Namibian hospitals, Namibian community pharmacies and even Namibian pharmaceutical industry. This certainly gives the students a very good background of pharmacy in the Namibian context.

What are knowers and knower-structures? According to Bernstein, knower structures are hierarchical (in humanist culture) and horizontal (in scientific culture). Therefore the opposite of knowledge structures. For every knowledge structure, there is also a specific knower structure (Maton, 2013). For the Bachelor of Pharmacy degree, all the knowers should be registered pharmacists with the Health Professions Council of Namibia (HPCNA). In this way, the curriculum does take into account appropriate knowers for the course. In addition, all lecturers are encouraged to specialise and get a PhD (horizontal) or a Diploma in Higher Education (hierarchical) to improve their knowledge and enhance their teaching performance.

The role of an academic in the relation to curriculum development in the institutions

As a staff member or agent, I am able to play an import role in the micro alignment of the course elements (Biggs' constructive alignment) (Biggs, 2003). Biggs argues that setting the curriculum objectives is the first important step. He states that if one can do this is right then the rest will follow. For example, decisions such as to how the students are supposed to be taught and assessed etc. There are different beliefs in practice as to whether assessment should be designed before or after learning methods. However, the most popular approach for a programme or module is to focus on the aims or outcomes. For example;

Table 3.1 Bachelor of Pharmacy micro alignment table.

Major outcomes ***On completion of this course students should be able to:***	**Assessment Methods**	**Teaching/Learning Activities**
Practise pharmacy within the legal requirements in a professional and ethical manner	Theoretical, practical, *viva-voce*	Pharmacy law and ethics – PCSL3721
Provide high quality-centred pharmaceutical care	Theoretical, practical, *viva-voce*	Pharmacy Practice – PCSP3622 Pathophysiology – PCST3752
Interpret and dispense prescriptions and medication orders	Theoretical, practical, *viva-voce*, research projects	Introduction to pharmacy and dispensing – PCTI3631
Provide information about medicines	Theoretical, practical, *viva-voce*, research projects	Placement II (industry and regulation) – PCPL2680 Rational use of medicine – PCRU2680
Promote and support Primary Health Care	Theoretical, practical, *viva-voce*, research projects, field attachment assessments	Primary health care promotion – PCDP351 Rural attachment – PCSU3739
Manage the manufacture of pharmaceuticals and related substances	Theoretical, practical, *viva-voce*, research projects, field attachment assessments	Pharmaceutical Science IV – PCPS2610 Placement II (Industry and regulation) – PCPL2680

		Applied pharmaceutical microbiology – PCTA3752 Pharmaceutical technology – PCTT3871 Physical Pharmacy – PCTP3632
Manage the pharmaceutical supply chain system	Theoretical, practical, *viva-voce*, research projects, field attachment assessments	Pharmacy supply and business I – PCSB2521
Manage pharmaceutical human resources	Not found	Not found
Manage pharmacy budget and financial operations	Theoretical, practical, *viva-voce*,	Pharmacy management – PCSM3872
Manage physical facilities for pharmaceutical operations	Theoretical, practical, *viva-voce*, field attachment assessments	Pharmacy management – PCSM3872
Manage pharmaceutical information systems	Not found	Not found
Conduct pharmaceutical and related research	Theoretical, practical, *viva-voce*, research projects	Research methods – PCSR3632 Research project – PCSR3880
Optimise patient care and inter-professional relationships	Theoretical, practical, *viva-voce*, research projects, field attachment assessments	Pharmacy management – PCSM3872
Apply information and communication technology	Theoretical, practical, *viva-voce*, field attachment assessments	Introduction to pharmacy and dispensing – PCTI3631

Based on this Biggs sequence we can see that the Bachelor of Pharmacy degree has a relatively good degree of micro alignment. However, it is not aligned in terms of the management of pharmaceutical information systems and pharmaceutical human resources (as seen above). This serious lack of information was reported to management. Such omissions have the ability to jeopardise the School of Pharmacy from fully realising all of its key objectives successfully in the imminent and distant future (unless rectified soon).

After critically reflecting on the micro alignment of my particular subject area, namely, Medicinal Chemistry (which falls under) Pharmaceutical Science (mentioned above in Table 3.1), I included the following sentence under the learning outcomes of my module: "Critique the use of this knowledge for the purpose of managing the manufacture of pharmaceuticals and related substances," as a means of directly improving the micro alignment of this module (See Appendix 3).

It is also important to note that there are different kinds of learning outcomes according to Hussey (2008), namely, those that are used in individual teaching events, those specified for modules or short courses and those specified for whole degree programmes. The first being the most useful, while the last, according to Hussey (2008), being a misuse of the term 'learning outcome'. In addition, the definitions of learning outcomes *vs* learning objectives is also highly contentious.

Institutional Quality Assurance (QA) principles and processes

The School of Pharmacy curriculum has been approved and accredited by national structures such as the Health Professions Council of Namibia (HPCNA), National Qualifying Authority (NQA) and the National Council for Higher Education (NCHE) – these are three independent examples of Quality Assurance (QA) mechanisms that work in relation to curriculum development at the institution on a macro level. Accreditation is vital to the success of the program.

Each subject in the curriculum has an NQF rating. The objectives of the NQF are to:

- Create a single integrated national framework for learning achievements;
- Facilitate access to, and mobility and progression within, education, training and career paths;
- Enhance the quality of education and training;
- Accelerate the redress of past unfair discrimination in education, training and employment opportunities.

The objectives of the NQF are designed to contribute to the full personal development of each learner and the social and economic development of the nation at large.

A four year Bachelor of Pharmacy degree is equivalent to a Professional Bachelor Degree or a Bachelor Honours Degree (Gertze, 2015), both of which are awarded at level 8.

Characteristics and purpose (Gertze, 2015)

According to the Namibia qualifications authority (NQA), 'Professional Bachelor degrees represent substantial attainment of a body of outcomes of learning greater than and in advance of a Bachelor degree. Such degrees normally contain a substantial element of 'learning by doing' and often focus on preparation for entry into a professional field of practice.'

The Namibian qualifications authority also state that Professional Bachelor degrees must:

- Build to a level of conceptual sophistication, specialised knowledge and intellectual autonomy (similar to that described for Bachelor Honours degrees)
- Include a terminal project or other supervised practice-based exercise(s) intended to demonstrate readiness for employment in the professional or occupational field of the qualification, and
- Require performance in accordance with a regulatory framework administered by a regulatory or professional body (and thus have the direct recognition and endorsement of that body).

A lower qualification may not be awarded for early exit from a Professional Bachelor degree programme except where exit represents the attainment of another qualification.

Level of certification (Gertze, 2015)

A Professional Bachelor Degree shall be awarded at Level 8.
A *minimum* of 480 NQF credits at Level 4 and above are required of which a *minimum* of 120 credits must be at level 8.

Size of qualification (Gertze, 2015)

The number of contributing credits from Level 4 is restricted to a *maximum* of 40 credits.
The Bachelor of Pharmacy degree has a total of 792 credits (and each credit represents about 10 hours of notional learning time). Of this, 176 NQF credits are at level 8. This is 'way'

above the 120 NQF credits which are required. This also suggests that the Bachelor of Pharmacy degree is loaded with an addition NQF points. We can conclude that this program definitely meets the NQF requirements.

In terms of institutional QA (Quality assurance) principles and processes on a micro level, how does one ensure the quality of education being taught or transmitted? Firstly, within a curriculum, all the module guides have very specific outcomes which need to be achieved in order for the student to pass (See Appendix 3). Special care should be taken reading the verbs of Blooms taxonomy (Table 3.2) for each module guide of the subjects which make up the curriculum, as these verbs reflect different levels or NQF of education (Table 3.3). As a result, I reworded the objectives of my Medicinal Chemistry II module guide (See Appendix 3) to be more in line with NQF level 8 'evaluation' type questions. For example, verbs such as appraise, evaluate, critique and justify are now in place.

Knowledge	Count, Define, Describe, Draw, Find, Identify, Label, List, Match, Name, Quote, Recall, Recite, Sequence, Tell, Write
Comprehension	Conclude, Demonstrate, Discuss, Explain, Generalize, Identify, Illustrate, Interpret, Paraphrase, Predict, Report, Restate, Review, Summarize, Tell
Application	Apply, Change, Choose, Compute, Dramatize, Interview, Prepare, Produce, Role-play, Select, Show, Transfer, Use
Analysis	Analyze, Characterize, Classify, Compare, Contrast, Debate, Deduce, Diagram, Differentiate, Discriminate, Distinguish, Examine, Outline, Relate, Research, Separate,
Synthesis	Compose, Construct, Create, Design, Develop, Integrate, Invent, Make, Organize, Perform, Plan, Produce, Propose, Rewrite
Evaluation	Appraise, Argue, Assess, Choose, Conclude, Critic, Decide, Evaluate, Judge, Justify, Predict, Prioritize, Prove, Rank, Rate, Select,

Table 3.2 Bloom's taxonomy verbs (Reece & Walker, 2006) (Hughes, 2017)

Blooms Taxonomy – classification of levels of intellectual behaviour
Evaluation level (NQF level 5 and up) Measures the highest level of cognition
Outcomes formulated at this level require learners to make judgements involving good or bad, right or wrong, competent or not yet competent, effective or ineffective, efficient or inefficient. Terms that can be used to assess the learner at the evaluation level: Judge, asses, decide, conclude, give an opinion, decide which is better, criticize, justify, appraise
Synthesis level (NQF 5 and up)
Outcomes formulated at this level require learners to have the ability to put parts together to form a new whole. Terms that can be used to assess the learner at the synthesis level: Create, plan, construct, formulate, put together, design, develop, draw up, illustrate, reconstruct, rearrange, revise, combine
Analysis level (NQF 4, 5 and 6)
The desire to know 'why', 'what' and 'how' is the basis of this level of performance. When something is analysed, the parts or components from which the facts or situation is composed, are determined. Analysis refers to the ability to break down a situation, procedure or object into its various components so that the organizational structure is understood. Analysis requires a higher level of understanding than application, as understanding of both content and structural form is required. Terms that can be used to assess the learner at the analysis level: Why, analyse, explore, compare, identify, interpret, determine, do you agree/disagree, separate, subdivide, infer.

Table 3.3 Bloom's Taxonomy verbs according to NQF level (Smith, 2017)

In addition, student lecturer evaluation reports are another form of QA. Here one can assess the classes' response to the lecturer and this can also indicate various types of QA issues that might need to be addressed. For example, does the lecturer come to lectures at the right time? Does the lecturer prepare for his or her classes adequately? Is there consistent order and structure to the material being delivered? This can provide valuable feedback from one of the key stakeholders in pharmacy education – namely the students.

All the exams at the School of Pharmacy are subject to external moderation and review. This is yet another means to ensure QA at the School of Pharmacy. Exams are normally sent to prominent academics in the South Africa who make sure that the level of the questions are comparable to other international institutions. This greatly assists the School of Pharmacy with both international accreditation and recognition. However, at this stage, staff are not sitting in on others' classes, mainly due to time constraints. Even though we all know that this is a very beneficial practice (Hendry & Oliver, 2012). Having student-lecturer feedback is extremely valuable (See Appendix 4), however, it is not being followed up with expert

personalised feedback as a means to improve quality. Therefore there is still more that can be done to improve quality.

Institutional Quality Assurance (QA) principles and processes is also enhanced by curriculum revision, which is an important part of academic work. Intensive dialogue between educational developers and academic staff provides important understanding in the context in which curriculum revision occurs (O'Neill, 2010). Being open and flexible is important during this activity.

To conclude, factors such as institutional context in relation to the curriculum, curriculum development practices, the relationship between knowledge, structures and curriculum development, my role as an academic in relation to curriculum development and institutional QA principles all play a vital and intertwined role the curriculum of the university. It is only through understanding these key factors that underpin the output of the university that one can fully grasp the direction in which the university and students are heading. Having a curriculum wish list or recommendation list is valuable to make sure that you are constantly moving towards your goals. This would require having a curriculum audit of sorts at the School of Pharmacy to ensure that the curriculum in place is being implemented correctly and that the curriculum is 'speaking to' the constantly evolving needs of all the stakeholders. Curricula themes such; alignment, relevance, institutional context, curricula responsiveness, curricula perspectives and quality assurance need to be constantly discussed in all meetings involving curricula development and implementation. I believe that if we had such curricula discussions or meetings more often at the School of Pharmacy, we would have a better product to offer the Namibian people.

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Chapter Four

Can I teach? What skills are needed for teaching and learning?

The aims here were to improve my knowledge of traditional and modern teaching and learning methods that are used in Higher Education and learn when to use them, as well as the strengths and weakness of these various methods. Once this was established, they had to be incorporated into an appropriate and theoretically informed teaching and learning philosophy for the courses that I teach. This fusion (combined with what was learnt in chapters 1-3) was that was needed to deliver an optimal learning experience for the learners. Academic development practitioners should also consider how they might influence dominant discourses, and enhance the dispositions of teaching academics to support quality teaching (Van Schalkwyk, 2015).

Design an appropriate and theoretically informed teaching and learning philosophy for the courses that you teach

Philosophy must be transformative, dynamic, curriculum with purpose, relevant, up to date, accredited and global… With this in mind, the following important points need to be considered:

a) Establish a baseline of what is *versus* what should be in an ideal world, in terms of structure (programs/ support), agency (personal/ psychology) and culture (beliefs / way of doing things).

b) Study international norms, standards and outcomes for pharmacy related subjects (especially pharmaceutical sciences).

c) Identify gaps and areas which need to be improved on.

d) Implement changes, evaluate, redo macro and micro alignment. Rediscover the subject and context to integrate and strengthen the Bachelor of Pharmacy degree.

Present situation

The existing philosophy and strategy is not sufficiently reflective and is hardly self-improving. Teaching is mainly limited to lecture based classes (transmitting knowledge) and practicals which are quite often not aligned to the theoretical component. Students often wonder the relevance of the topic and might disengage as they don't see the immediate link between medicinal chemistry (for example) and the practice of pharmacy in the real world.

Therefore, an observation is that medicinal chemistry classes are quite often out of context with the reality of the chemistry that a pharmacist is required to practically know (in many or cases).

It is my suggestion that Medicinal Chemistry lecturers therefore ought ideally to be registered pharmacists and not chemists (in order to fully understand the expectations and requirements of being a qualified and registered Namibian pharmacist). However, this is not always possible as there are limited pharmacists who have specialised in Medicinal Chemistry.

A full retrospective analysis is required to align this module with current perceptions and market place requirements. Instead of pure chemists believing that they know what pharmacists need to know, I suggest that the medicinal chemistry lecturers be sent to the community, hospital and industry pharmacy settings to rediscover the discourse required to be competent and able.

In addition, extra support from the Royal Pharmaceutical Society or other international universities (i.e. educational tool and module guides) should be obtained and studied by experts at the School of Pharmacy (standing on the shoulders of giants). This information then needs to be decolonialised and recontextualised to serve the needs of the Namibian people and market demands.

During my visit to the University of Cardiff I had a very interesting discussion with my counterpart, Dr Claire Simons. I was very impressed with the methods that they use to teach various pharmaceutical science subjects. At the School of Pharmacy (University of Cardiff) subjects are often not taught in isolation. Instead, they use a cross cutting method.

When studying the chemistry (isolation, characterisation and synthesis) of salbutamol (for example) the lecture is also linked with how the drug works in the body (pharmacology), the manufacture of the inhaler (pharmaceutics) as well as how the product should be

administered to the patient (pharmacy practice). In this way the pharmacy students are able to see the 'big picture' much easier because the links between the various disciplines have been clearly outlined and explained to the student. This approach is often lacking with the pharmacy students at the University of Namibia. Harden (2000) has proposed that integration is an important educational strategy in medical education. Harden (2000) describes 11 points, namely; isolation, awareness, harmonization, nesting, temporal co-ordination, sharing, correlation, complementary, multi-disciplinary, inter-disciplinary and trans-disciplinary which are key for good integration to take place (Figure 4.1).

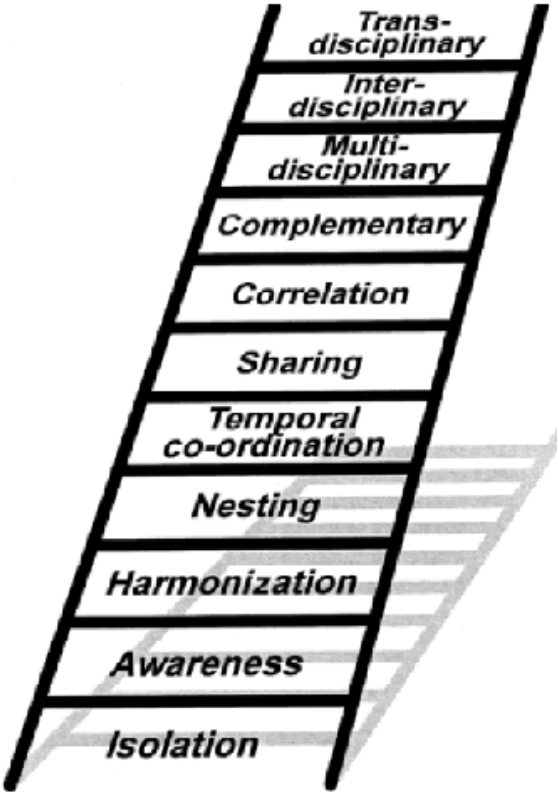


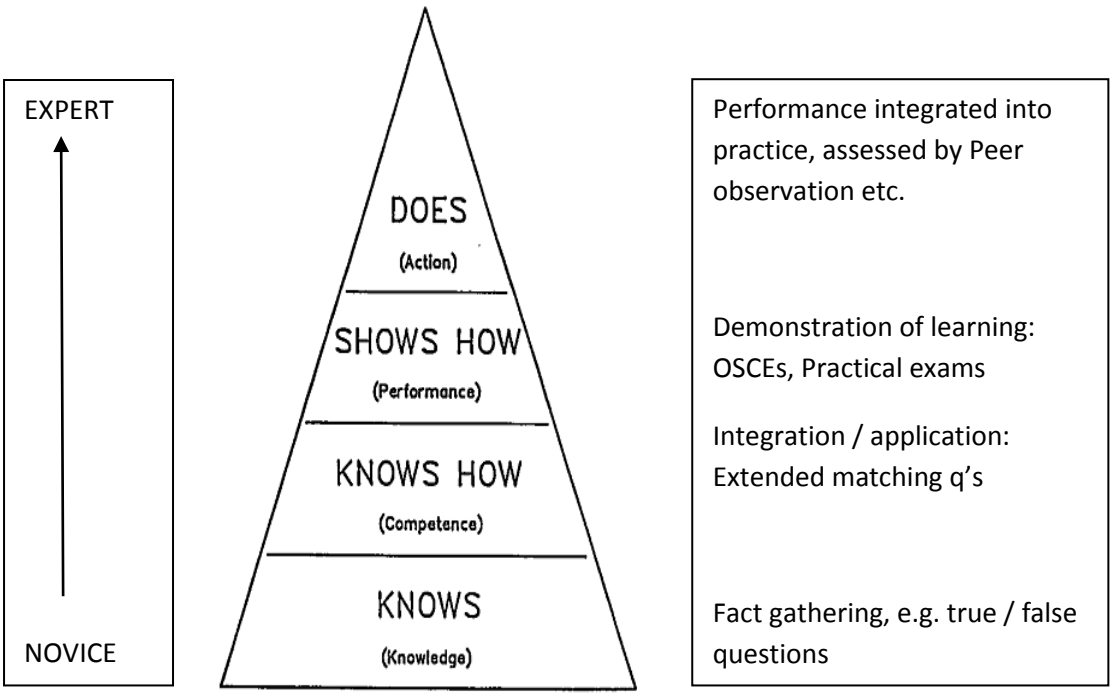
Figure 4.1 Harden's Integration Ladder (Atwa & Gouda, 2014)

Teaching and learning (Strategic plan)

The contemporary (modern day) university teacher should transform education and ensure that interactive blended learning with the use of various academic technologies (for example by making use of Panopto lecture capture and Moodle online platform) are used to his or her advantage (Chu et al., 2010).

There is a structured move by some towards defining pedagogy in terms of the process of student learning rather than the details of teaching inputs (Luckett & Luckett, 2009). Knowledge is to be transmitted *via* technology, while face-to-face engagement should be of the highest importance and should be primarily interactive. The formation of virtual or actual learning communities or discussion groups is also encouraged. The idea is that a student 'knows how' from technology and gets 'showed how' from face to face classes. The framework for clinical assessment is shown below (Figure 4.2). From this we can see that knowledge alone is not sufficient. For this reason, theoretical lectures have to be aligned with the practical components.

Figure 4.2 Framework for clinical assessment (Miller, 1990)



The lecturer should ensure that the course being offered or presented is dynamic and responsive to the needs of society by building links with pharmaceutical industry and healthcare facilities. The lecturer should guarantee top standards and international accreditation and ensure that external moderators regularly give the latest advice and mentoring. The lecturer should design a curriculum fit for purpose, which underpins the values and mission of the university. In addition, the lecturer should regularly undergo educational training and be an agent of positive and meaningful change. Benchmarking against international pharmaceutical science exams, anticipating the needs of the country (in terms of pharmacist's pharmaceutical science knowledge) and also collaborating with other universities is considered essential.

What next in terms of teaching techniques?

The implementation of this teaching and learning philosophy is essential. However, before this could be done, I needed to practically explore the various kinds of teaching strategies which one might use in a particular scenario. I also needed to ask the question, which of these strategies is best suited to pharmaceutical science in Namibia?

There are a number of different types of teaching strategies and techniques (some more formal than others). Each techniques has its own process (as well as advantages and disadvantages) (Shalyefu, 2017). For example;

- Brainstorming – this encourages active input from the students and uses their knowledge and expertise.
- Case studies – used to analyse and learning from real situations which the students might encounter.
- Demonstration – used to allow students to see how something is done.
- Drama – is a good way of allowing people to come together to discuss and solve problems.
- Field trips – this allows students to see how things are done in the real world.
- Film – this technique can be very useful (i.e. a picture is worth a thousand words)

- Fishbowl – this allows the student on the outside to see what is happening on the inside. (i.e. observation of role play)
- Games – are intended to help the students learn information or skills.
- Ice breakers/ Energizers – used to assist students to relax, wake up or regain their interest.
- Jigsaw technique – whereby each participant is an expert in a small area and the students share their knowledge to build up a complete picture of the topic being discussed.
- The Kitchen concept – involves asking the members of the local community to share their knowledge with the students.
- Lecturettes – are short lectures which are used to highlight key points of importance.
- Role plays – are used to explore real situations and what can be done or solved.
- Panel discussions – involve experts exploring a topic, while the students listen and learn.
- Peer training – enables experts in a field to assist in the training process.
- Pictures – the use of simple pictures can often greatly assist explaining complex theories.
- Simulations – are able to involve the students directly in an experience.
- Song and dance – is often used as a part of learning about traditional cultures.
- Small groups – are often used if the training group is too large (for example).
- Buzz sessions – are used when students need to express opinions or discuss a topic.

Equipped with all these possibly useful 'educational arrow's' in my quiver, I was overwhelmed with these different options which needed to be explored further below.

What next in terms of learning theories?

Learning theories play an import role in the manner in which your lecture is to be delivered.

Which paradigm is best suited to a particular environment? The following are well-known paradigms (David, 2017).

- Behaviourism – For example, classical conditioning by Pavlov or classical and operant conditioning by Skinner.
- Cognitivism – For example, Gestalt theory (the idea that the whole is greater than the parts)
- Constructivism – For example, Social development theory by Vygotsky
- Design-based research methods – For example, balancing theory and practise in education
- Humanism – For example, experimental learning by Kolb or incorporating Maslow's hierarchy of needs
- 21st Century skills – For example, digital citizenship. Can the internet promote equal opportunity, improve democracy and better human rights?

What next in terms of both teaching techniques and learning theories?

With this plethora of options as well as so many varied academic and technical techniques and theories, where does one start? I had already learnt that my opinion was not always the best approach. I had also learnt that a teaching technique or learning theory might work for one subject, but not another. As a result, I put this question to the class instead…

A discussion was held in the classroom. I explained the different teaching techniques as well as the different learning theories briefly to the student body (as part of a stakeholder engagement initiative). I asked them to choose the way forward. Again, the results were both surprising and informative for me.

No one style or technique was preferred by everyone in the class to any great degree as might be expected when considering different learning styles and preferences. This suggested that a

blended approach would be the best method of teaching. A central theme which came out was that a good lecturer should be kind, caring, patient, motivated and able to develop relationships with the students (because he or she understands the students' needs). Some of these qualities were already highlighted in chapter 2 and here go a step further to suggest that these crucial humanistic features of a good lecturer are even more important than the teaching technique or learning theory being used in the class.

From theory to actually doing

Armed with all this theory, how could I use this to improve my own teaching? One does not simply walk into a classroom and hope for the best. Lots of preparation and passion is key when delivering a successful teaching session. Many lecturers are resistant to change or self-improvement (Quinn, 2012), however, I do not feel that I am part of this cohort.

Obviously, a lot of thought, reflection and understanding has to go into each teaching session as you need to successfully combine teaching philosophy, teaching techniques, learning theories and evaluation criteria into a fruitful 'performance' for the class.

According to the Centre for Professional Development, Teaching and Learning Improvement (CPDTLI) the following 43 evaluation criteria also need to be skilfully addressed when lecturing (CPDTLI, 2017) (Table 4.1):

Table 4.1 CPDTLI's 43 evaluation criteria

EVALUATION CRITERIA
1. LESSON PLAN & PREPARATION:
a) Appropriate objectives developed i.t.o [1] of topic
b) Attainable competencies indicated
c) Content described in detail
d) Appropriate teaching strategies indicated
e) Appropriate learning strategies indicated
f) Resources identified and available for use
g) Appropriate assessment strategies indicated i.t.o attainment of competencies
2. LESSON INTRODUCTION
a) Gained immediate interest
b) Linked up with students' prior knowledge
c) Clarified objectives for lesson
d) Creative introduction

3.	**LESSON PRESENTATION**
a)	Presented content in a logical sequence
b)	Made insightful use of subject knowledge
c)	Used a variety of relevant learning and assessment tasks to develop students thinking skills
d)	Communicated with all students
e)	Patient with, interested in, listening to students
f)	Demonstrated good questioning skills
g)	Included open/higher level questions
h)	Praised and corrected answers to questions/learning efforts
i)	Sensitive to gender, ability, special needs and individual differences of students
j)	Students engaged in active learning
k)	Student-centered activities used
l)	Positive methods of reinforcement
m)	Summary of main ideas and conclusion given
4.	**SUBJECT KNOWLEDGE**
a)	Demonstrated an understanding of subject knowledge
b)	Related knowledge to life situations and other subjects
c)	Developed the thinking and values of students
d)	Used own subject knowledge
5.	**COMMUNICATION SKILLS**
a)	English usage was proficient
b)	Spoke clearly with a varied tone
c)	Appropriate non-verbal communications skills used effectively
d)	Communicated with all sectors of the class
6.	**TEACHING AND LEARNING MEDIA**
a)	Varied use of creative and appropriate media
b)	Effective and skillful use of teaching/ learning media
7.	**LECTURE ROOM MANAGEMENT**
a)	Implemented orderly procedures for students entrance, leaving, participation
b)	Maintained discipline assertively
c)	Organized physical conditions well
d)	Created a democratic atmosphere
e)	Managed time effectively
8.	**ASSESSMENT**
a)	Assessed students' understanding continuously
b)	Used constructive probing of students' knowledge and understanding
c)	Appropriate feedback provided
d)	Provided exercises for practice/homework give
9.	**GENERAL IMPRESSION OF LECTURER**
a)	Demonstrated confidence and enthusiasm for teaching
b)	Appeared friendly and caring towards students
c)	Demonstrated emotional maturity and responsibility
d)	Appropriately dressed and groomed

To assist with this process, I also attended a number of lectures given by other staff in the School of Pharmacy (Appendix 5). The benefits of peer observation of teaching to augment and improve teaching sessions are well-known (Bell & Mladenovic, 2008). From this eye-

opening experience, I learned a lot about how other lecturers deal with similar challenges that I face on a daily basis in the classroom. I took the best for what was working for both the students and the lecturers and brought some of these styles and techniques into my own classroom.

For example, I saw that students prefer learning through games and not excessive lecture slides. Students also enjoy movement and not just sitting still and being quiet.

The following list of positive styles, attitudes or approaches, seen during my peer observation of other lecturers who were giving lessons, helped me to boost certain aspects of my own teaching and learning experience. These lecturers had:

- A decent amount of confidence (which is very subjective)
- Passion and enthusiasm
- Lots of knowledge surrounding the subject
- Lots of lecturer-student interaction in the classroom
- Discussion based more than solely reading off the slides alone
- Good use of English language
- Relating to the students and their problems (within the context of Namibia)
- Caring, understanding and respect
- Self-directed learning along with full notes placed on Moodle to allow for better classroom based discussions

My observed teaching session

How was I feeling?

My nerves were shot! It felt that the more I learned about teaching and learning, the less I knew… My confidence was falling, I had doubts and I was beginning to wonder if I was in the right place? Maybe I was better suited to a dispensary than a university lecture room? Surely, nobody can be a successful lecturer with all these educational skills that are prescribed? I felt overwhelmed and underprepared… Gripped with anxiety, cognitive dissonance and a sense of fatality, I had to make a choice; to walk into the classroom or to walk out of the university… I chose to pack up and hide my anxiety, tachycardia and self-doubt. Instead I decided to, 'Fake it until I make it.'

Rationale

The underlying principles of cognitive behavioural therapy (CBT) suggest that by continuously imitating confidence and good lecturer behaviour, one eventually becomes what he or she is imitating (McLeod, 2015). Hence the notion of, 'Fake it until I make it.'

Preparation

The lecture I was evaluated on was a broad based community pharmacy related topic entitled, 'Expectations of the employer' and copies of the slides can be seen in Appendix 6.

Appendix 7 is a copy of the lecture plan that was implemented. This includes the pre-presentation component, the presentation component and the post-presentation component. This teaching session was based on my knowledge of the students, the context of the university and adult education, the outcomes required by the stakeholders and the aligned curricula as well as my belief in applying a humanistic and constructivist fun teaching style. I hoped to get the students interested and motivated about working in a community pharmacy by preparing them (in an interactive manner) as to what they could expect during their placement.

Outcome

Appendix 8 is a copy of the lecturer observation form which was completed by Prof. Timothy Rennie, the Associate Dean of the School of Pharmacy which showed very positive feedback.

Conclusion

The positive outcome and feedback from this process can be seen in Appendix 8. For this I was given a final grade of 90% and an A rating, which means that I demonstrated excellent competence of the criterion.

I felt happy about getting good peer reviewed feedback from someone that I respect. Although the results were good, I felt that I could have used more of my technological educational knowledge and skills. For example, I could have uploaded the slides onto the Moodle platform (for the students) or incorporated the teacher session onto Panopto for online viewing.

I could also have used more of my face to face time with the students by showing them how to behave in a pharmacy, instead of spending the time focussing on building up the students' knowledge of what to expect in a pharmacy.

However, since most the teaching session was successful, I am also inclined to keep doing the same as before with respect to aspects of the session which the students responded well too (for example: teaching through interactive games, relating the subject to the expectations of the students and the real world, trying to understand the academic and contextual needs of the students etc.)

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Chapter Five

How do we evaluate and assess (the students)?

In order to demonstrate skills on the assessment and evaluation of teaching and learning in Higher Education I had to learn the concepts used in assessment and evaluation. Then I had to evaluate the various types of assessment and evaluation in Higher Education with reference to a specific subject content, in my case pharmaceutical sciences. For example, where are the gaps? Are there opportunities for doing things better? What tools could be developed and what skills are needed?

The flipside of evaluating or assessing students is of course ensuring that the students also have good test or exam technique. I also wanted to assist the students with some relatively easy techniques so that they could be more 'testwise' and benefit by possibly improving their overall performance.

What is 'testwise'?

Testwiseness (is advantageous over simply education guessing) is defined as the ability of a test taker to react to the presence of secondary clues in way advantageous to himself on a MCQ test (Mahamed et al., 2006). Some might argue that being testwise is a reflection on the poor quality of the assessment which is poorly written. It can be about being able to pass an assessment without knowing anything about the topic. For example, some students are good at passing tests as they are able to work out how to rule out MCQ options on basis of structure /layout / grammar rather than content. Some of these useful skills can be learnt by the students.

I often spend time with the students giving very obvious advice regarding how to answer MCQ questions. As obvious as the advice is, many still do not listen, for example:

- Please answer all the MCQ questions. Do not leave out answers. (Especially since I do not use negative marking.)
- Please make sure you understand the MCQ question before answering it.
- Eliminate the outliers.

- Do not spend too much time on one question.
- Be careful of double negatives.
- Often, the longest answer is the correct answer. In theory, this means in some cases, you can answer without knowing anything about topic!
- Trust your first answer – it is usually the correct answer. Going back later and changing your first answer often leads to mistakes.

Many interesting questions about testwiseness still need to be researched. For example, does testwiseness correlate with performance in experiential learning in clinical practice, in retention and recall of learned material or even contribute to the day to day practice as a pharmacist (Mahamed et al., 2006)? The students appreciated this information and where surprised that nobody had ever taken the time to explain some of the above mentioned bullet points to them before.

Explain the concepts used in assessment (and evaluation) and evaluate various types of assessment (and evaluation) in Higher Education

Pharmaceutical science modules are evaluated and assessed in two ways, continuous assessment and a final exam. The final semester grade is based on the total percent as indicated below in Table 5.1 (See Appendix 3).

Table 5.1 Mark allocation for pharmacy subjects

Continuous Assessments	**(60%)**	**Exam Assessment**	**(40%)**
Course assignments (x 3)	**15%**	Final Examination (written)	**100%**
Written tests (x 3)	**60%**		
Practice labs (x 10)	**25%**		

There are three main kinds of assessment, namely; diagnostic, formative and summative. The nature of these assessments has been summarised in Table 5.2 below.

In brief, diagnostic assessment investigates and measures the prior knowledge, skills and preconceptions of the learners, whilst formative assessment occurs during the learning process. Formative assessment provides feedback during the learning process and is most often conversation related. It does not count for marks. Summative assessment occurs at the end of the learning block. It counts for marks and usually evaluates a student against a specific number of standards (Queens University, n.d.).

Table 5.2 Summary of the various assessment types (Queens University, n.d.)

	Diagnostic	**Formative**	**Summative**
Feedback	Informal	Dialogue-based/comments	Grades
Timing	Prior to instruction	During learning experience (small check-ins)	End of unit or course
Rationale	Assess prior knowledge, skills, preconceptions, etc.	Monitor learning and provide feedback	Evaluate student against some standard benchmark
Examples	Background knowledge survey; ungraded quiz	Practice quizzes, minute papers, in-class writing exercises, clearest/muddiest point exercises, various kinds of group work in the class	Multiple choice midterm and final exams; final project; term paper

The approach taken by lecturers for various types of informal diagnostic assessment questions is most often based (for example) on the subject matter being taught:

For example, in social sciences or psychology the instructor might survey the students' assumptions about the concepts that will be taught during the course (e.g. the nature of mind or behaviour). While in hard sciences (such as mathematics and physics) the instructor might use a set of conceptual questions to assess the students' understanding of fundamental concepts at the start of the course (Queens University, n.d.). Both of these different techniques have pros and cons. Often with social sciences subjective opinions are important and can be debated freely in class as part of the learning process. However, with hard sciences (in many cases) opinions are not as important as facts which are better assessed with a pen and paper (than a discussion). However, in both cases diagnostic assessment is a useful tool to find out how much the students know. This information is valuable to the lecturer as it assists him or her in pitching the lecture at the correct level. It also gives the lecturer more informal information about the students which will assist the lecturer in setting the correct

tone or context of the approach taken towards the class. For example, if you found out that your class consists solely of conservative Roman Catholics, a lecture on various contraceptive methods might be more controversial than normal. Depending on the type of formative assessment which is carried out (i.e. discussion or oral survey), one of the cons is that diagnostic assessment can sometimes be too informal and subjective to give an accurate academic baseline level of the entire class.

Examples of formative assessments include most commonly various kinds of Classroom Assessment Techniques (CATs) – for example; background knowledge probe, muddiest point in the lecture questionnaire, or simply a one minute test. CAT's are a very useful measure to establish if the students are grasping the concepts and information which is being delivered to them. They can also be fun and interactive if done correctly. However, CAT's do require good class participation to be successful. CAT's can be difficult to perform if some students' refuse to participate.

Summative assessments are formalised and refer to final exams, projects and assignments which count for grades. There are of course a number of different summative methods of assessment or summative assessment tools available to the lecturer, for example (Exeter University, n.d.):

- Assignments – group or individual
- Case studies – based on hospital clinical patients
- Exams – may consist of multiple choice questions (MCQ's) such as ZipGrade. ZipGrade is an app which turns an iPhone or iPad into an optical scanner for the immediate grading of MCQ type questions.
- Exams – may also consist of short questions or essay type questions.
- Oral Presentations
- Poster Presentations
- Peer Review - Students assess each other
- Performance assessments
- Portfolios – A collection of evidence complied to demonstrate that the learning outcomes have been achieved.

From these examples it can be seen that a lot of thought needs to go into finding the correct summative assessment method for your particular subject, your students and your context.

Choice of summative assessment

The aim of assessments is to promote student learning. Good assessment is linked to having an effective curriculum and effective types of instruction in place. These three different branches should work together and also reinforce each other (National Research Council, 2001). In other words, constructive alignment is required. According to Biggs (2014), 'Constructive alignment is a design for teaching in which what it is intended students should learn and how they should express their learning is clearly stated before teaching takes place. Teaching is then designed to engage students in learning activities that optimise their chances of achieving those outcomes, and assessment tasks are designed to enable clear judgments as to how well those outcomes have been attained.'

Is there such a thing as the 'ideal assessment'? If so, what factors will determine this? There are many pros and cons for each type of summative assessment. For example, assignments and case studies are a great way of getting students' to do their own research and investigations. However, if you give the whole class the same assignment or case study, this drastically increases the tendency of the students to copy one another (an act of plagiarism). As a result, course assignments or case studies do not often (or always) reflect the actual academic ability of the individual student. Based on this, we reduced the mark allocation (Table 5.1) of the course assignments from 30% to 15% back in 2015. Oral presentations are excellent for testing communication skills, but this would be the wrong assessment method if you were testing medical writing skills for example. Poster presentations are usually done in a group. In many cases, the leader of the group does all the work and all the talking, whilst others in the group might do little and still take credit for the work.

Most assessments in the field of pharmaceutical science are summative assessments as this is appropriate for a professional degree whereby you need to demonstrate competence. It could be argued that more formative assessment should take place during some of the classes to assist the students with their learning and understanding (i.e. more classroom interactions).

In addition, one soon learns that what works for one pharmacy subject (in terms of the style of assessment) might not work for another. For example, Socrative is an online app which is useful for MCQ testing of various clinical Pharmacy Practice knowledge related questions, however it cannot be used if you want the student to explain how a lengthy chemical reaction mechanism takes place.

Logistics

Logistics should not be the main reason for a choice of assessment, but it naturally plays a role in terms of whether or not you can have the 'ideal' (theoretically) assessment. One soon learns that assessing big classes is very different to assessing smaller classes. For example, if you have over 100 students in first year, this is a very large class to assess. One of the only viable options is the use of MCQ questions and ZipGrade paper for rapid marking. However, if you only have 20 students, one is able to give essay type assignments with ease. MCQ's have certain pros and cons, as do essay type questions. With some subjects certain kinds of technology can be very useful, however, with other subjects certain kinds of technology can be a burden or very cumbersome to use. For example, using ZipGrade technology is of little use if one is going to assess if students can write properly. However, ZipGrade MCQ type questions can be useful for assessing knowledge recall of the students'. If MCQ's are to be used, they must reflect mastery of the domains targeted by the examination. Standards must be in place.

Standards

Setting good standards is critical with examinations used in medical education, as these students must acquire the skills, knowledge and competence necessary for safe and effective patient care (De Champlain, 2010). What standards should be used? There are two types of standards, norm-referenced and criterion referenced standards. In pharmaceutical science, we generally follow criterion referenced standards. This is because the student must be capable of demonstrating clinical pharmaceutical skills before he or she is eligible to practise as a pharmacist. Many of these generic type clinical skills are directly imported from UK based pharmaceutical educational programmes (for example; how to counsel patients, how to test blood pressure and cholesterol, how to check for drug-interactions etc.)
The results of norm-referenced exams are based on the results of the class or group as a whole and adjusted to reflect a more normal distribution curve. Norm-referenced exams often take place at High Schools around the country.

The Angoff method (with norm based criteria) is compensatory to some degree and the final standard is obtained by averaging all the individual items. Therefore, a student can do very poorly in one section and very well in another and still pass. This method is most commonly

employed in the field of pharmaceutical sciences to assess the pharmacy students. However, this method is not acceptable in areas where the student needs to pass key areas to demonstrate that competence has been achieved. For this, an examinee-centred approach is highly recommended (for performance assessments) as they entail direct judgment regarding the level of the student (De Champlain, 2010).

Feedback

Another important aspect of assessment is timely and honest feedback. This is a crucial part of the learning process and should not be ignored as a key component of the learning process. Feedback can have powerful and positive effects on achievement (Juwah et al., 2004). Formative assessment can therefore be an important platform for effective learning, especially if both feedback and feed forward are used correctly. Emphasising continuous learning and encouraging self-regulated learning is best done *via* formative assessment.

Formative assessment also allows the students a chance to make mistakes and learn from these mistakes before their summative assessments take place. This process is very important to the learner (Wheatley et al., 2015). It is important to conceptualise these techniques and methods and find out what works best for each unique group and or subject concerned.

Identify and design various assessment and evaluation tools for a specific subject

Before starting, it is important remind yourself to focus on what the learning outcomes are that you are trying to assess for a particular subject. These can be found in the module guide. These learning outcomes must then be linked to the correct choice of assessment design. Learning outcomes should be the base of any assessment design. In short, what are we trying to assess and how can we best do this?

For the 2016 Medicinal Chemistry exam a number of various assessment techniques were taken into account. For interest, I have included only my questions found in the exam in Appendix 9.

One of the stated learning outcomes was to evaluate the physico-chemical properties, various modes of action, chemical synthesis, nomenclature and side effects of various drug molecules (in relation to the patient who is of course taking the medicines in question). In my experience, one of the best ways as assess the students understanding of the physico-chemical properties and side effects of drugs and how they affect the human body in asking the students to draw the chemical mechanisms of the reactions taking place. This approach is unique to Medicinal Chemistry and is not used in other pharmacy related subjects.

When choosing the best question type for a particular exam one is faced with many challenges. It involves balancing both cost and benefits.

A well designed assessment will use different types of questions for the content being examined. Research also suggests that the question format is of limited importance and that it is the content of the question that determines what the question tests (Schuwirth & van der Vleuten, 2003). However, this does not suggest that using the correct format for the questions is not important. For example, some types of knowledge cannot be tested using MCQ's, while MCQ's are much better than open ended questions for other types of knowledge. The Medicinal Chemistry exams as seen in Appendix 9 has a blended approach and consists of MCQ's, short questions and long answer question. This was intentionally done to embrace the pros and cons of different questioning styles.

The advantage of MCQ questions according to Schuwirth & van der Vleuten (2003) is that they can be used well to evaluate the correctness of an assumption. The disadvantage is that MCQ's cannot be used to test creativity, hypothesising and writing skills. In addition, it is also important to teach the teachers how to write good MCQ's. Interestingly, studies have also shown that MCQ questions can be used with success to assess application, analysis, synthesis and evaluation for pharmacology (Stupans, 2006).

Short answer open ended questions are more suited to questions that require creativity and spontaneity. For example, if you wish to test factual knowledge, MCQ's are often a better method, however, in more practice based topics there may be more than one correct answer. In such cases, short answers are often a useful approach to take.

Long questions or essays are good for assessing how well students can summarise, hypothesis, find relations and apply known procedures to new situations. In addition, essay questions also give insight into the students' ability to write and express his/her ideas.

However, these questions are often very time consuming to mark (Schuwirth & van der Vleuten, 2003). For my subject, namely Medicinal Chemistry, I find that long essays alone are not the most appropriate assessment method. Instead, I prefer a combination of illustrated 'reaction mechanisms' and brief discussions explaining the proposed reaction mechanisms. In terms of expressing the language of Medicinal Chemistry, illustrated reaction mechanisms are more effective than simply using words alone (in my opinion).

There are five criteria that can be used to evaluate various types of questions (Schuwirth & van der Vleuten, 2003):

- Reliability – refers to the accuracy of the mark allocation.
- Validity – does the question actually test what it is supposed to test?
- Educational impact – students focus on what they believe is important.
- Cost effectiveness – in terms of time and resources
- Acceptability – amongst both students and lecturers

In terms of my Medicinal Chemistry exam (Appendix 9); reliability and validity was assessed by the internal and external moderators, namely, Dr. Vetja Haakuria and Prof. Jacques Petzer. The internal and external moderators were also able to assess the cost effectiveness (i.e. was there enough time to answer these questions and there the resources at UNAM adequate?) as well as the acceptability of the exams.

The order to address educational impact, the long questions in Section C (as seen in Appendix 9) are all questions that the students felt were important during class. The students felt that these questions were important because they directly explained the reasons for doing things in a pharmacy (in terms of the unique language used in Medicinal Chemistry, namely reactions mechanism). For example, question one uses Medicinal Chemistry to explain why expired tetracyclines should be thrown away (and never consumed). Question two explains why Penicillin G is an injectable preparation and not in a tablet form (in terms of the chemistry involved). Question five explains how to reduce the gastric side effects of erythromycin and also decrease daily administration rates by synthesizing azithromycin or clarithromycin analogues (in terms of the chemistry involved). It is important to note that my

long questions in Section C were not pure essay type questions (as one might expect from a normal Section C type question). Instead, my Section C questions were a blended approach which incorporated drawing reaction mechanisms and explaining or discussing these mechanisms in detail. This assessment technique was intentionally done so that my exam would suite the subject matter as well as the competence criteria that the students out to demonstrate, which is (amongst other outcomes) for them to evaluate the physico-chemical properties and side effects of drugs and how they affect the human body (in terms of Medicinal Chemistry).

In Section B (for example), question one asks the students to explain why Penicillin G has a narrow spectrum of activity and how a possible solution ought to be found? Question three also had more than one answer, 'Highlight the key structural features of fentanyl and diphenoxylate and how both these compounds where derived from the same parent compound.' These types of questions are suitable for short questions as there is more than one answer. The students enjoyed answering these questions as they felt they had direct relevance to the practice of pharmacy.

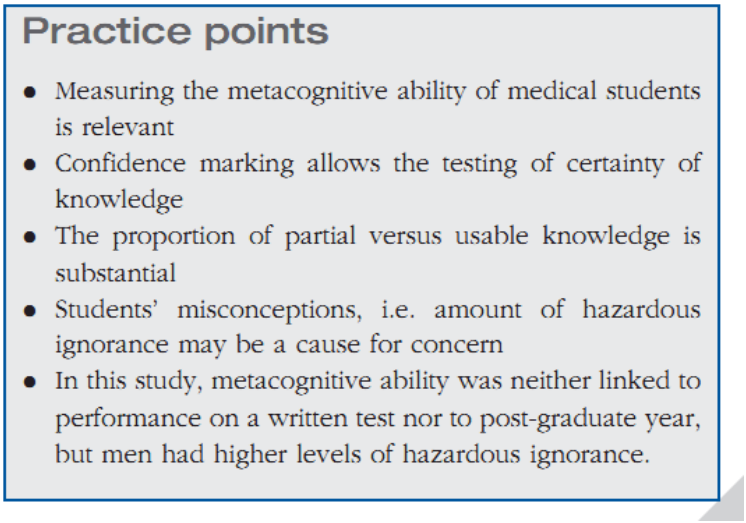
In addition, students should be assessed not only on clinical reasoning and progress of clinical reasoning, but also on their ability to judge their own reasoning (Dory et al., 2010). How confident are the students about their knowledge? A third of trainees' knowledge was partial, a sixth of their ignorance was hazardous. Therefore, confidence marking (which might incorporate negative marking) is a useful tool for summative assessment (Dory et al., 2010). In terms of MCQ type questions, negative marking can improve test reliability by penalizing misinformation as well as by discouraging guessing (Burton, 2004).

Although I have not yet made use of negative marking in my exams, I sometimes ask a similar question in two different ways to assess if the student is certain of his/her answer. For example, in Appendix 9, some of the MCQ's have a slight overlap with the longer questions in Section B and C.

Metacognition is, 'Knowing about knowing.' Pharmacists must be able to monitor their abilities and performance in order to be safe and effective to the public. Instilling this sense of self-regulation is very important in the pharmaceutical profession. This is often done during class when I make use of formative assessment techniques. I inform the class where to look up various kinds of pharmaceutical information and not to be afraid to refer or to ask for additional pharmaceutical advice from others if required.

The following summary has practical points which are very important with regards to the students' metacognition (Figure 5.1) (Dory et al., 2010). Note, although this study was done on medical students, it also applies to pharmacy students.

Figure 5.1 Practical points regarding a student's knowledge and metacognition (Dory et al., 2010)

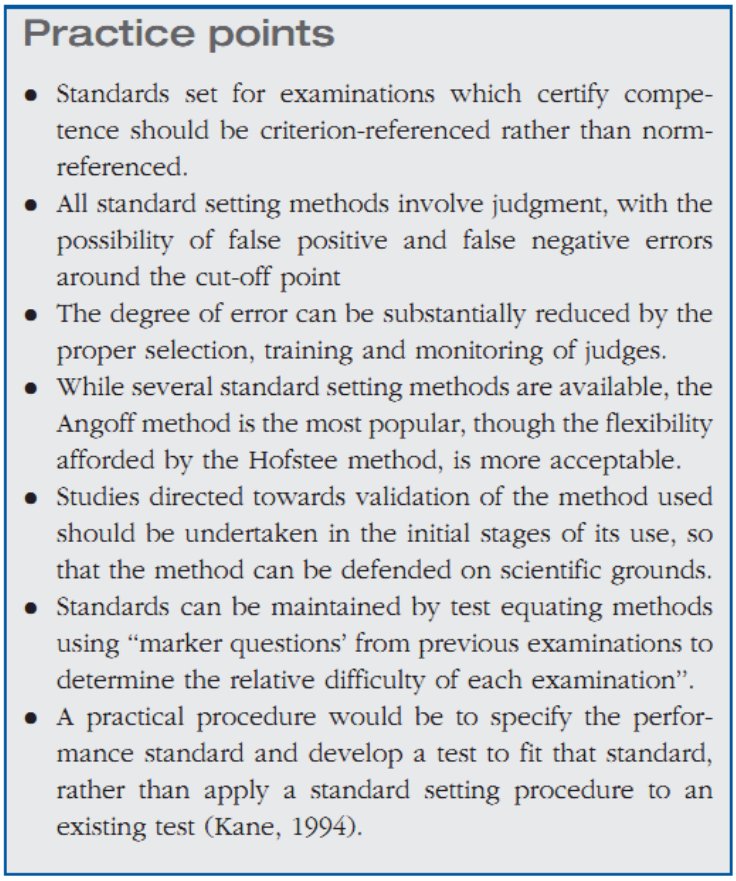


Quality control in Higher Education

All exam papers at the School of Pharmacy are sent outside of Namibia for external moderation. Most of them are sent to professors of pharmacy in South Africa. This is an important means of quality control and its management in Higher Education at UNAM. Some of the practical points of setting standards are highlighted below (Figure 5.2).

Standing on the shoulders of giants always saves a lot of time! For the purpose of improving quality control, I am always on the lookout for new or novel Medicinal Chemistry exam questions, especially if they come from the Royal Pharmaceutical Society of Great Britain or a university of great repute. Integrating theory and practice is a synergistic learning experience for the student. However, cross-cutting and integrating various themes within the pharmacy discipline across subjects is even more synergistic and further improves quality control (in my opinion). For example, an assessment on aspirin could incorporate medicinal chemistry (synthesis and analysis of aspirin), pharmacology (how the drug works), pharmaceutics (how to make Dispirin®) and pharmacy practice (how to counsel patients on taking the medicine).

Figure 5.2 Practical points on setting and maintaining standards (Bandaranayake, 2008)



Practice points

- Standards set for examinations which certify competence should be criterion-referenced rather than norm-referenced.
- All standard setting methods involve judgment, with the possibility of false positive and false negative errors around the cut-off point
- The degree of error can be substantially reduced by the proper selection, training and monitoring of judges.
- While several standard setting methods are available, the Angoff method is the most popular, though the flexibility afforded by the Hofstee method, is more acceptable.
- Studies directed towards validation of the method used should be undertaken in the initial stages of its use, so that the method can be defended on scientific grounds.
- Standards can be maintained by test equating methods using "marker questions' from previous examinations to determine the relative difficulty of each examination".
- A practical procedure would be to specify the performance standard and develop a test to fit that standard, rather than apply a standard setting procedure to an existing test (Kane, 1994).

The above mentioned assessment approach might further enhance quality control. In terms of teaching, a students' performance in an assessment also can enhance the quality of our teaching as we may identify problem areas where all students seem to be confused and then we can adapt and change our teaching in the future.

Conclusion

The aim of assessments is to promote student learning. From this chapter we can see that evaluating or assessing students is not straightforward or simple. It is often very subtle and involves a meticulous and rationalised approach which can be very time consuming if done properly, as one needs to take into account; selecting the correct type of assessments, logistics, standards, feedback and quality control for the specific subject and students involved.

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Chapter Six

What am I hoping to achieve in the future?

Getting this portfolio together has been a fascinating experience in itself and yet it still only represents a part of my current journey in tertiary education. A long journey still lies ahead of me... Education is about the students having a brighter future through excellent training and supervision. This portfolio showcases some of my accomplishments over the last two years under five different themes, however, there is still a lot more that I need to learn about in the space of pharmaceutical university education.

In the future I hope to achieve an even greater understanding of tertiary education as well as positively transforming the lives of all my students by inspiring them through my passion and enthusiasm for pharmacy.

This diploma has already greatly enhanced the quality of my teaching ability and knowledge of Higher Education. I will continue using all the knowledge and skills which I have learnt during this course to benefit my students. As a result of this diploma, I am also better equipped and capable of balancing teaching methodology and content to meet the students' academic needs.

What next? A doctorate degree in tertiary education? Or a lifelong learner in tertiary education? The skills learnt from this diploma will certainly assist me in understanding the fundamentals of managing various kinds of tertiary education functions at a higher level, which in turn will also contribute to my eligibility for promotion.

This learning experience has certainly given me insight and rekindled my curiosity into the brave new world of education. Contrary to Pandora's Box which only let out the evils of the world, opening this 'educational box' has let out a lot of positive and insightful discoveries, especially in the areas of pedagogy, educational context, diversity, instructional strategies, assessment, critical thinking and professional responsibility.

In the future, I certainly plan on transforming people and communities for the better through outstanding and quality education. Thank you for sharing this exciting and new journey with me into the heart of Namibian pharmaceutical science education.

Appendix 1 - Questionnaire

Learning about my students.

This questionnaire has 7 sections and should take less than 7 minutes to complete.

Demographics

1. Are you male or female?
   Mark only one oval.

   - Male
   - Female

2. What is your date of birth?

Example: 15 December 2012

3. Are you a Namibian citizen?
   Mark only one oval.

   - Yes
   - No
   - Namibian Resident

4. Are you a first language English speaker?
   Mark only one oval.

   - Yes
   - No

5. What is your first language?

6. Where you raised by your biological parents?
   Mark only one oval.

   - Yes
   - No

7. How many siblings do you have?
   Mark only one oval.

   0 1 2 3 4 5 6 7 8 9 10

8. Are you married?
Mark only one oval.

- Yes
- No

9. Do you have children of your own?
Mark only one oval.

- Yes, living with me
- Yes, not living with me
- No

10. Would you describe yourself as being religious?
Mark only one oval.

- Yes
- No
- Sometimes

Social features

11. Where do you live while attending classes at UNAM?
Mark only one oval.

- UNAM student residence
- With parents
- With other family members
- Rented accommodation outside UNAM
- None of the above

12. Do you study alone or with friends?
Mark only one oval.

- Alone
- With friends

13. Do you party a lot while at university?
Mark only one oval.

- Yes
- No
- Sometimes

14. Is student peer pressure a factor in your life?
Mark only one oval.

- Yes
- No
- Sometimes

15. If the answer to the above question was yes, please give examples...

16. Do you feel safe at home?
Mark only one oval.

- Yes
- No
- Sometimes

17. How do you get to campus and into the city?
Mark only one oval.

- I own a car
- Taxi
- I walk
- I ask friends for lifts
- Bicycle
- Other

18.In terms of safety, have you ever been attacked or robbed in Windhoek during your University studies?
Mark only one oval.

- Yes
- No

19. If the answer to the above question was yes, what happened?

Economic situation

20. How are you funding your studies?
Mark only one oval.

- Student Loan
- Bursary
- Privately funded (family)
- Combination of the above
- Other

21. Are you working and studying at the same time?
Mark only one oval.

- Yes
- No
- Sometimes

22. If the answer to the above question was 'yes' or 'sometimes', what work do you do?

23. Do you have enough money to feed yourself every day?
Mark only one oval.

- Yes
- No
- Most of the time
- Seldom

Psychological characteristics of the adult learner

24. I look on the bright side.
Mark only one oval.

1 2 3 4 5

No Yes

25. I pay attention to details.
Mark only one oval.

1 2 3 4 5

No Yes

26. I feel others' emotions.
Mark only one oval.

1 2 3 4 5

No Yes

27. I trust what people say.
Mark only one oval.

1 2 3 4 5

Never Always

28. I take things as they come.
Mark only one oval.

1 2 3 4 5

No Yes

29. I feel sad.
Mark only one oval.

1 2 3 4 5

Always Never

30. I accomplish my work on time.
Mark only one oval.

1 2 3 4 5

Never Always

31. I worry about what people think of me.
Mark only one oval.

1 2 3 4 5

Never Always

32. I can find the positive in what seems negative to others.
Mark only one oval.

1 2 3 4 5

Never Always

33. I know how to comfort others.
Mark only one oval.

1 2 3 4 5

No Yes

34. I make friends easily.
Mark only one oval.

1 2 3 4 5

Never Always

35.I think highly of myself.
Mark only one oval.

1 2 3 4 5

Yes No

36. I remain hopeful despite challenges.
Mark only one oval.

1 2 3 4 5

No Yes

37. I use laughter to brighten the days of others.
Mark only one oval.

1 2 3 4 5

No Yes

38. I am interested in people.
Mark only one oval.

1 2 3 4 5

No Yes

Possible learning barriers

39. Rate your level of English on a scale of 1-5.
Mark only one oval.

1 2 3 4 5

Poor Excellent

40. Is English language a possible learning barrier?
Mark only one oval.

1 2 3 4 5

No Yes

41. Is your mathematical ability a learning barrier?
Mark only one oval.

1 2 3 4 5

No Yes

42. Are financial constraints a possible learning barrier?
Mark only one oval.

1 2 3 4 5

No Yes

43. Is transportation a possible learning barrier?
Mark only one oval.

1 2 3 4 5

No Yes

44. Are family commitments and responsibilities cause learning difficulty?
Mark only one oval.

1 2 3 4 5

No Yes

45. My family supports and encourages me...
Mark only one oval.

1 2 3 4 5

No Yes

Future plans

46. Which sector of Pharmacy do you wish to work in after you graduate?
Mark only one oval.

- Community
- Hospital
- Industry
- Academia
- Other

47. Do you plan on staying in Namibia?
Mark only one oval.

- Yes
- No
- Maybe

Appendix 2 - Responses

Edit this form

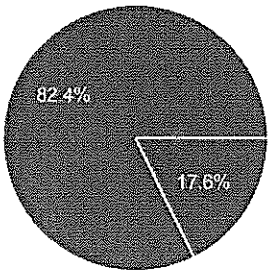
18 responses

View all responses Publish analytics

Summary

Demographics

Are you male or female?



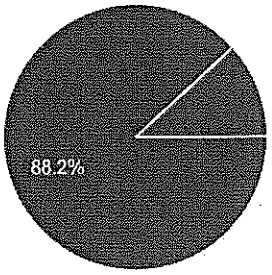
Male	3	17.6%
Female	14	82.4%

What is your date of birth?

Oct 1991	26
Nov 1991	3
Jun 1992	7
May 1993	25
Jun 1993	11
May 1994	26
Jul 1994	2 5
Sep 1994	1
Feb 1995	23
Jun 1995	19
Sep 1995	30
Oct 1995	24

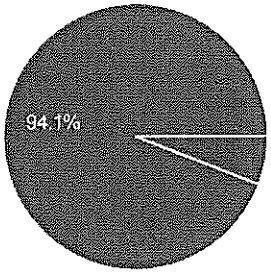
Mar 1996	8
Dec 2016	30

Are you a Namibian citizen?



Yes	**15**	88.2%
No	**2**	11.8%
Namibian Resident	**0**	0%

Are you a first language English speaker?



Yes	**1**	5.9%
No	**16**	94.1%

What is your first language?

Oshiwambo

oshiwambo

Oshikwanyama

Afrikaans

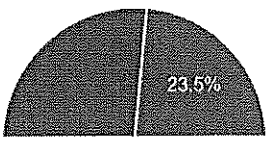
Swahili

Oshiwambo

German

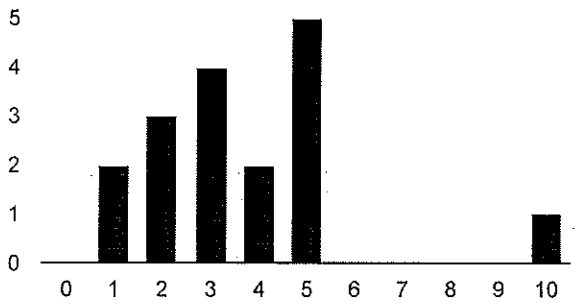
Shona

Where you raised by your biological parents?



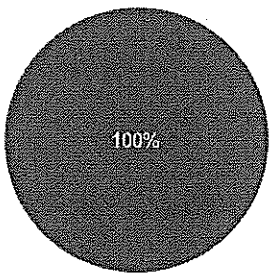
Yes	**13**	76.5%
No	**4**	23.5%

How many siblings do you have?



0	**0**	0%
1	**2**	11.8%
2	**3**	17.6%
3	**4**	23.5%
4	**2**	11.8%
5	**5**	29.4%
6	**0**	0%
7	**0**	0%
8	**0**	0%
9	**0**	0%
10	**1**	5.9%

Are you married?

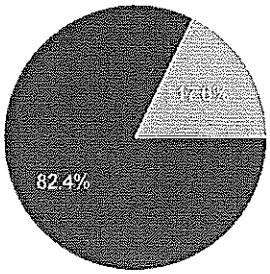


Yes	**0**	0%
No	**17**	100%

Do you have children of your own?

Yes, living with me	**0**	0%
Yes, not living with me	**0**	0%
No	**17**	100%

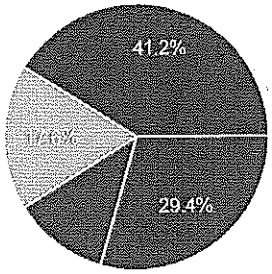
Would you describe yourself as being religious?



Yes	**14**	82.4%
No	**0**	0%
Sometimes	**3**	17.6%

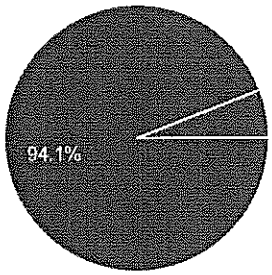
Social features

Where do you live while attending classes at UNAM?



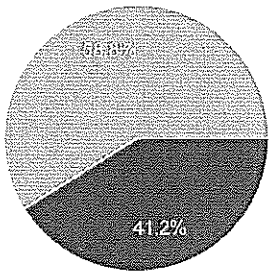
UNAM student residence	**5**	29.4%
With parents	**2**	11.8%
With other family members	**3**	17.6%
Rented accommodation outside UNAM	**7**	41.2%
None of the above	**0**	0%

Do you study alone or with friends?



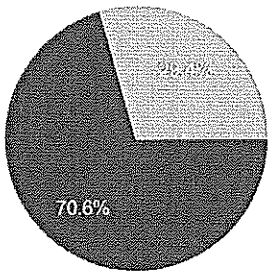
Alone	**16**	94.1%
With friends	**1**	5.9%

Do you party a lot while at university?



Yes	**0**	0%
No	**7**	41.2%
Sometimes	**10**	58.8%

Is student peer pressure a factor in your life?

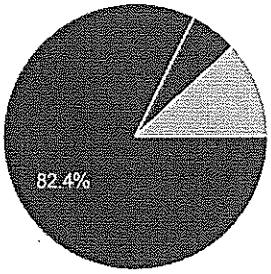


Yes	**0**	0%
No	**12**	70.6%
Sometimes	**5**	29.4%

If the answer to the above question was yes, please give examples...

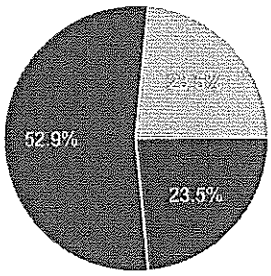
N/A

Do you feel safe at home?



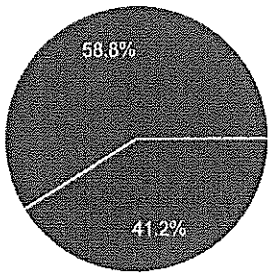
Yes	14	82.4%
No	1	5.9%
Sometimes	2	11.8%

How do you get to campus and into the city?



I own a car	4	23.5%
Taxi	9	52.9%
I walk	4	23.5%
I ask friends for lifts	0	0%
Bicycle	0	0%
Other	0	0%

In terms of safety, have you ever been attacked or robbed in Windhoek during your University studies?



Yes	7	41.2%
No	10	58.8%

If the answer to the above question was yes, what happened?

N/A

I lost my phone in a robbery, they treatend me with a knife

I went to the new gate after school and there was no security officer.so four guys enter the premise heading the side of the school, when they looked back they realised that there was no safety officer so they came back for me i screamed loud and i bite one guy.They kicked me on the head and neck trying to get my bag.luckly they didnt take it because one security officer came.

My phone got stolen

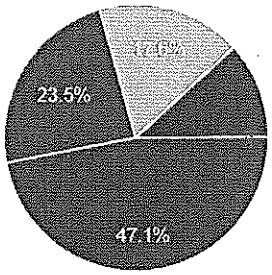
bag snatched in town

We were three, after school, escorting a school-mate home, in windhoek-west and a car with a group of guys stopped right next us and pointed a gun at me as i was the one in front. I didn't know if it had bullets or if it was cocked or they were just trying to scare us so we give our staffs. so i took a risk and ran in the opposite direction from where they came from, while shouting to my two schoolmates to do the same and follow me. Only two of us managed to run away, but my friend who we were escorting lost all his gadgets, (laptop, phone), money and log-book. He is also a student at UNAM school of medicine, although we were together when all happened. i never felt so weak, as there was nothing we could do to go back and help out my friend, the guys had guns and we had nothing, no weapons of any kind. we didn't even remember to get hold of the plate number as everything happened too fast. so we hid in some bushes while we waited until all was clear. when i think of it i still feel the same feeling of shock and fear that i felt during the whole scene.

Robbed off my phone while walking to school

Economic situation

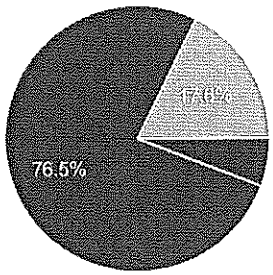
How are you funding your studies?



Student Loan	8	47.1%
Bursary	4	23.5%
Privately funded (family)	3	17.6%
Combination of the above	2	11.8%

Other	0	0%

Are you working and studying at the same time?



Yes	1	5.9%
No	13	76.5%
Sometimes	3	17.6%

If the answer to the above question was 'yes' or 'sometimes', what work do you do?

N/A

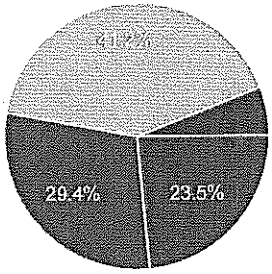
Student Pharmacist at a community pharmacy.

Help out at a nearby pharmacy

Help out at a Pharmacy

Work in community pharmacies sometimes

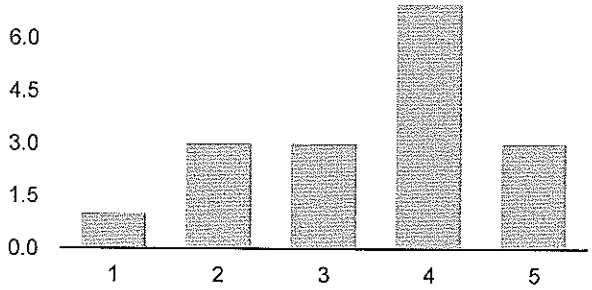
Do you have enough money to feed yourself every day?



Yes	4	23.5%
No	5	29.4%
Most of the time	7	41.2%
Seldom	1	5.9%

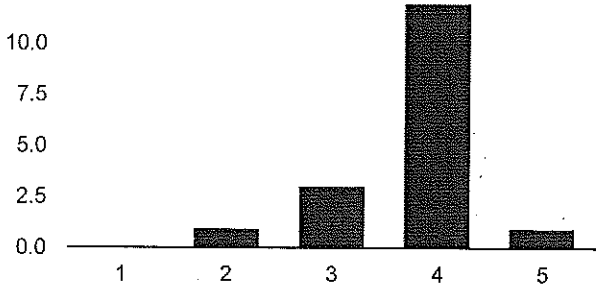
Psychological characteristics of the adult learner

I look on the bright side.



No : 1	**1**	5.9%
2	**3**	17.6%
3	**3**	17.6%
4	**7**	41.2%
Yes: 5	**3**	17.6%

I pay attention to details.

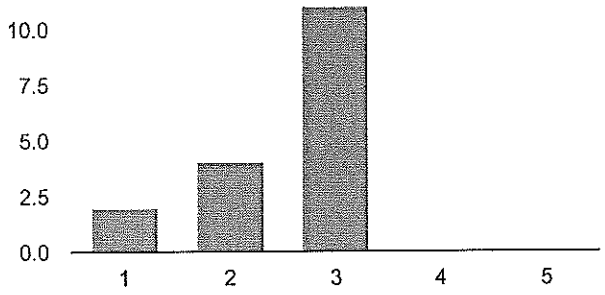


No : 1	**0**	0%
2	**1**	5.9%
3	**3**	17.6%
4	**12**	70.6%
Yes: 5	**1**	5.9%

I feel others' emotions.

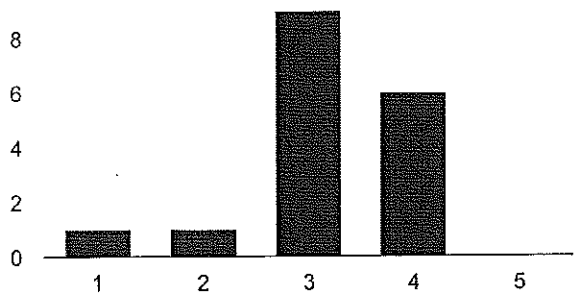
No : 1	0	0%
2	1	5.9%
3	6	35.3%
4	7	41.2%
Yes: 5	3	17.6%

I trust what people say.



Never : 1	2	11.8%
2	4	23.5%
3	11	64.7%
4	0	0%
Always: 5	0	0%

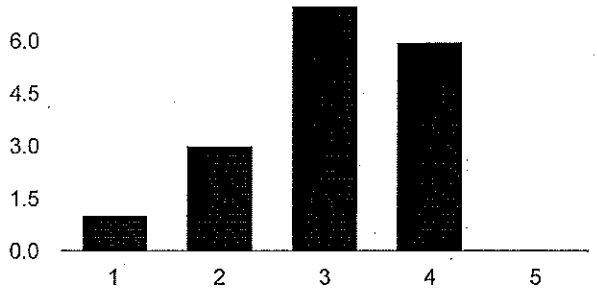
I take things as they come.



No : 1	1	5.9%

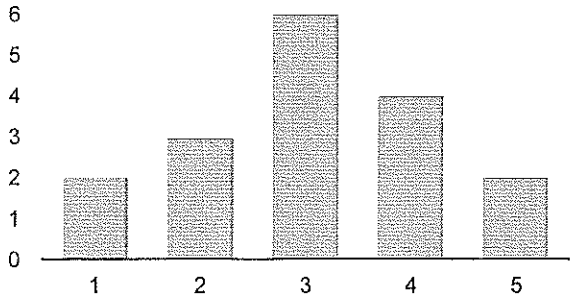
2	1	5.9%
3	9	52.9%
4	6	35.3%
Yes: 5	0	0%

I feel sad.



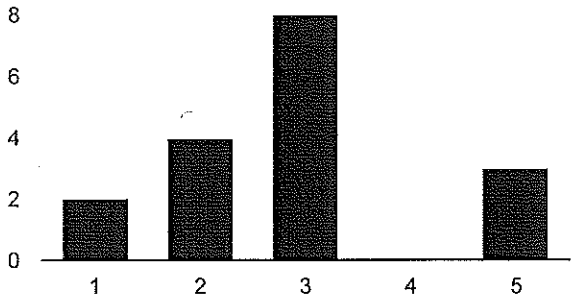
Always: 1	1	5.9%
2	3	17.6%
3	7	41.2%
4	6	35.3%
Never: 5	0	0%

I accomplish my work on time.



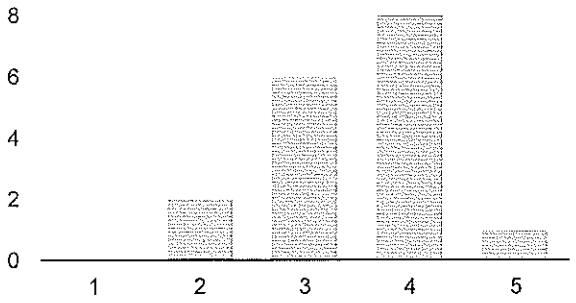
Never : 1	2	11.8%
2	3	17.6%
3	6	35.3%
4	4	23.5%
Always: 5	2	11.8%

I worry about what people think of me.



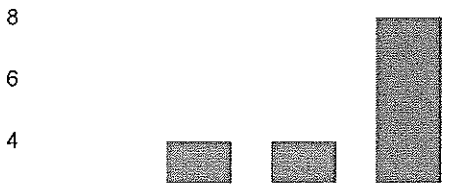
Never : 1	**2**	11.8%
2	**4**	23.5%
3	**8**	47.1%
4	**0**	0%
Always: 5	**3**	17.6%

I can find the positive in what seems negative to others.



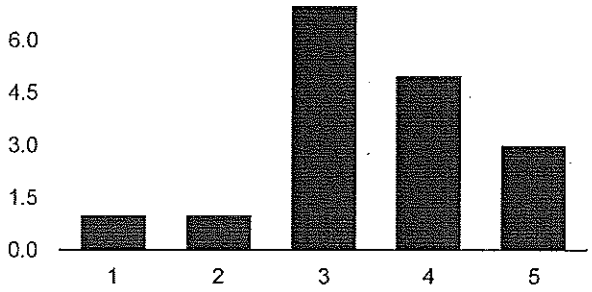
Never : 1	**0**	0%
2	**2**	11.8%
3	**6**	35.3%
4	**8**	47.1%
Always: 5	**1**	5.9%

I know how to comfort others.



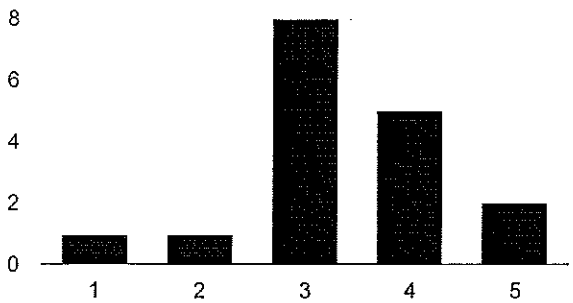
No : 1	**0**	0%
2	**4**	23.5%
3	**4**	23.5%
4	**8**	47.1%
Yes: 5	**1**	5.9%

I make friends easily.



Never : 1	**1**	5.9%
2	**1**	5.9%
3	**7**	41.2%
4	**5**	29.4%
Always: 5	**3**	17.6%

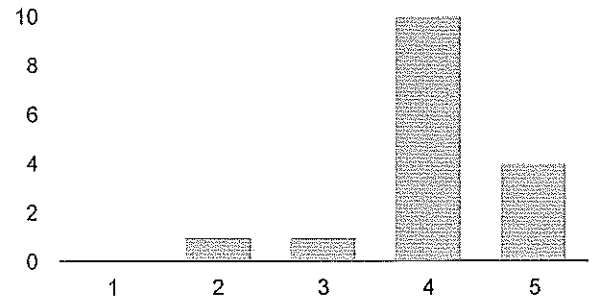
I think highly of myself.



Yes : 1	**1**	5.9%

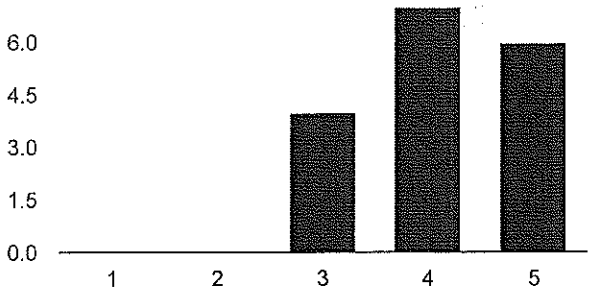
2	**1**	5.9%
3	**8**	47.1%
4	**5**	29.4%
No : 5	**2**	11.8%

I remain hopeful despite challenges.



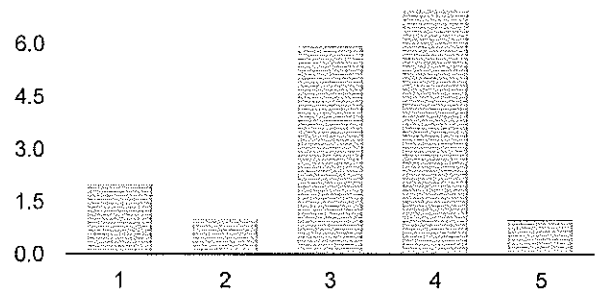
No : 1	**0**	0%
2	**1**	6.3%
3	**1**	6.3%
4	**10**	62.5%
Yes: 5	**4**	25%

I use laughter to brighten the days of others.



No : 1	**0**	0%
2	**0**	0%
3	**4**	23.5%
4	**7**	41.2%
Yes: 5	**6**	35.3%

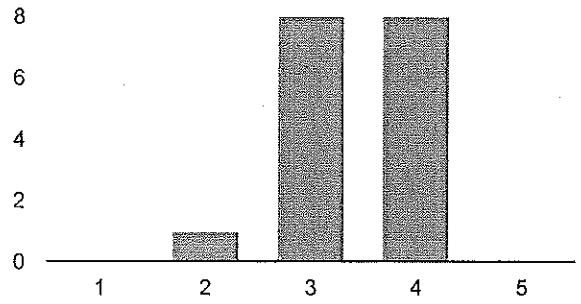
I am interested in people.



No : 1	**2**	11.8%
2	**1**	5.9%
3	**6**	35.3%
4	**7**	41.2%
Yes: 5	**1**	5.9%

Possible learning barriers

Rate your level of English on a scale of 1-5.

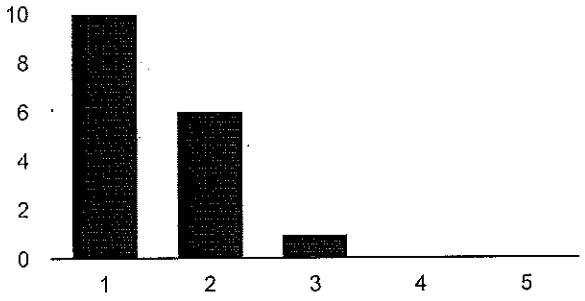


Poor: 1	**0**	0%
2	**1**	5.9%
3	**8**	47.1%
4	**8**	47.1%
Excellent: 5	**0**	0%

Is English language a possible learning barrier?

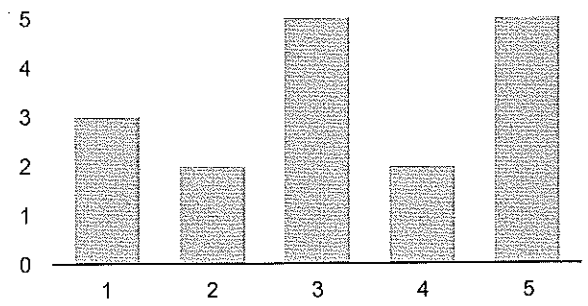
No : 1	**7**	41.2%
2	**2**	11.8%
3	**2**	11.8%
4	**2**	11.8%
Yes: 5	**4**	23.5%

Is your mathematical ability a learning barrier?



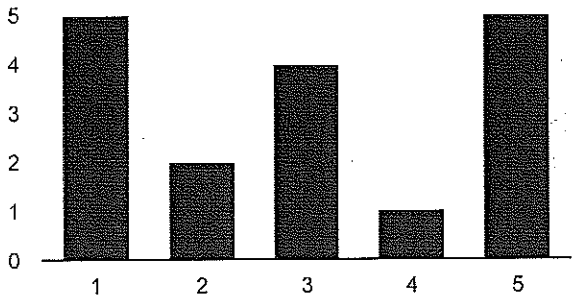
No : 1	**10**	58.8%
2	**6**	35.3%
3	**1**	5.9%
4	**0**	0%
Yes: 5	**0**	0%

Are financial constraints a possible learning barrier?



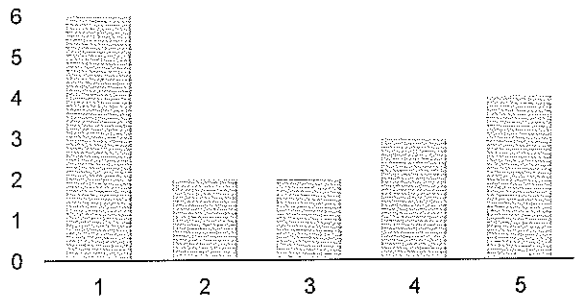
No : 1	3	17.6%
2	2	11.8%
3	5	29.4%
4	2	11.8%
Yes: 5	5	29.4%

Is transportation a possible learning barrier?



No : 1	5	29.4%
2	2	11.8%
3	4	23.5%
4	1	5.9%
Yes: 5	5	29.4%

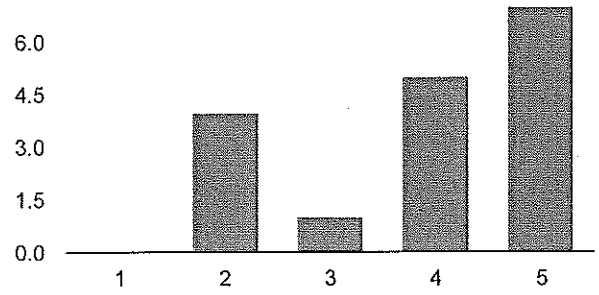
Are family commitments and responsibilities cause learning difficulty?



No: 1	6	35.3%
2	2	11.8%
3	2	11.8%
4	3	17.6%

Yes: 5 **4** 23.5%

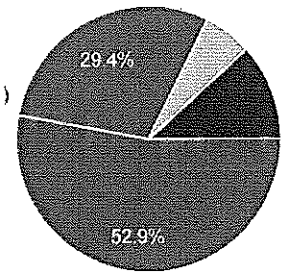
My family supports and encourages me...



No : 1	**0**	0%
2	**4**	23.5%
3	**1**	5.9%
4	**5**	29.4%
Yes: 5	**7**	41.2%

Future plans

Which sector of Pharmacy do you wish to work in after you graduate?

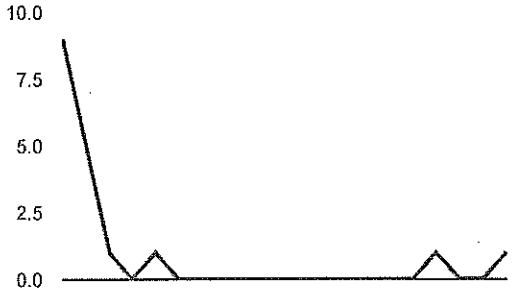


Community	**9**	52.9%
Hospital	**5**	29.4%
Industry	**1**	5.9%
Academia	**0**	0%
Other	**2**	11.8%

Do you plan on staying in Namibia?

Yes	**12**	70.6%
No	**3**	17.6%
Maybe	**2**	11.8%

Number of daily responses



Appendix 3 - Module Guide for Medicinal Chemistry II

FACULTY OF HEALTH SCIENCES

SCHOOL OF PHARMACY

COURSE SYLLABUS / STUDY GUIDE

PCMM3871

MEDICINAL CHEMISTRY II

B. Pharm IV

PREPARED BY: DR MICHAEL KNOTT

DEPARTMENT OF PHARMACEUTICAL CHEMISTRY AND PHYTOCHEMISTRY

SCHOOL OF PHARMACY

UNIVERSITY OF NAMIBIA

JANUARY 2017

Table of content

Module Facilitators:

Dr Michael Knott

Office phone: 061 2065054

E-mail: mknott@unam.na

Room number: School of Pharmacy

Office Hours: 09:00 – 16:00

Mr Anthony Ishola

Office phone: 061 2065001

E-mail: aishola@unam.na

Room number: School of Pharmacy

Office Hours: 09:00 – 16:00

Mr Daniel Mavu

E-mail: dmavu@unam.na

Room number: School of Pharmacy

Office Hours: 09:00 – 16:00

Ms Klaudia Amakali

E-mail: ktamakali@unam.na

Room number: School of Pharmacy

Office Hours: 09:00 – 16:00

Module information

Module title	Medicinal Chemistry II
Module Code	PCMM3871
NQF level	8
Contact hours	3 lecture hours + 3 hours of practical's per week
Credits	16
Assessment	60% Continuous assessment 40% Examination (1 X 3 hours written paper)
Pre/Co-requisite	PCMM3752
Lecture days and Class hours	Wednesday (9:30-10:30) and Thursday (9:30-11:30)
Lecture Venue	School of Medicine, New Campus
Practical days and Class hours	Monday (14:00-17:00)
Progressive Examination dates*	TBC
Final Examination dates*: First Opportunity Second Opportunity	TBC

Module description

An introduction to the design and discovery of new compounds that are suitable for use as drugs was covered in medicinal chemistry I. Medicinal chemistry II in an extension of this and covers not only the discovery or design process, but also nomenclature, the synthesis of the drug, it's structure activity relationships (SAR's), physico-chemical properties, methods of administration, mode of action, chemical reactions and side effects of the drug molecules. In addition, this module also has a focus on pharmaceutical biotechnology and radiopharmaceuticals.

1.0 Learning Outcomes

At the end of the module a, student is expected to be able to:

- Evaluate the basic concept of drug discovery, design and synthesis
- Evaluate the physico-chemical properties, various modes of action, chemical synthesis, nomenclature and side effects of various drug molecules
- Appraise various processes in pharmaceutical biotechnology
- Justify your understanding of radiopharmaceuticals in the pharmacy profession
- Critique the use of this knowledge (above) for the purpose of managing the manufacture of pharmaceuticals and related substances

2.0 Methods of Teaching and Learning Environment

In order to achieve the intended outcomes of a seven star pharmacist, various methods of teaching will be adopted in this module. Such methods will include didactic lecturers, practicums, and problem based tutorial sessions as well as self-directed learning will be encouraged. Virtual media will also be used.

2.1 Didactic Lecture Sessions

All the lectures in this module will not be for more than 60 minutes in duration, ideally, 45 minutes for lecturing and 15 minutes for question-answer sessions. The power point presentation is the intellectual property of the lecturer and he/she has the right not to distribute it – we encourage students to take notes. Pharmacy students are expected to behave professionally and appropriately in lectures. Distracting classmates and/or faculty with conversation is unprofessional and is not acceptable. All lectures remain compulsory for all B Pharm students – it is only in the interests of the students to attend!

2.2 Problem Based Tutorials/ Case Studies

Before PBL is introduced, students will have a revision in this teaching method.

A number of sessions will be conducted using 'real life' simulated problems and case studies through tutorials sessions organized in small groups. Students will resolve problems that address issues covered in the lectures. The students will elect a chair person who will guide the group members on a procedure to resolve the problem. A tutor will be available in each session to facilitate learning and guide students.

These sessions will last not more than 60 minutes at locations that will be communicated. Such case studies will enhance the development and application of key skills in drug discovery, design and synthesis and team playing and multidisciplinary learning. Students are expected to review case studies before the tutorial and come prepared to contribute. Attendance of small group sessions is mandatory for this module. Student's active participation will be assessed during these tutorial sessions.

2.3 Practice laboratories ('practicums')

Pharmacy practice relates to all aspects of the 7-star pharmacist. This module will assist you to develop skills, knowledge and decision-maker, communicator, community leader, manager, researcher, and life-long learner. Students will be able to apply and integrate knowledge gained through lectures into practice through practicums. Practicums will be introduced to acquaint

students with the steps and tenacity of medicinal Chemist in discovery, design synthesis and testing of drugs.

2.4 Self-directed learning

One of the attributes of a 7 star doctor or pharmacist trained at UNAM is being a lifelong learner. The Medicinal Chemistry module will stimulate and open up a new world for pharmacist and enhance self-learning through course work particularly for most aspects of the subject where time and lectures are not adequate to cover important topics in great detail. Such self-directed learning will be reflected in small group tutorials where students will be requested to individually respond to questions. It is the student's responsibility to conduct independent research on the topic. Students will be randomly divided into small groups for 'home' study at the beginning of the semester.

3.0 Attendance policy

Please refer to the University of Namibia attendance policy for the class. You must attend all classes and practicals in order to be able to meet the course objectives. Arriving late in class of practicals is disruptive to the learning environment for both students and lecturers.

4.0 Plagiarism policy

The Pharmacy profession is based on individual integrity. Personal responsibility and professionalism are two key areas in the development of a pharmacist. By taking an oath as a student pharmacist, it is assumed that you accepted a role at the School of Medicine community with self-respect and duty. You will be requested to sign a form as acceptance to maintain integrity during the Medicinal Chemistry module. All course work and examinations submitted by the student are expected to be the student's work.

5.0 Textbooks and references

The main reference text books for Medicinal Chemistry module will be:

1. Lemke, T.; Williams, D. Foye's Principles of Medicinal Chemistry. 7th Edition, 2013
2. Patrick, G. An introduction to Medicinal Chemistry. 5th Edition
3. Beale, J.; Block, J. Organic Medicinal and Pharmaceutical Chemistry. 12th Edition, 2011

6.0 Evaluation methods

The module will be assessed in two ways including continuous assessment and final examinations. The final semester grade will be based on the total percent as indicated by the letter grades below.

Continuous Assessments	**(60%)**	**Exam Assessment**	**(40%)**
Course assignments (x 3) Written tests (x 3) Practice labs (x 10)	**15%** **60%** **25%**	Final Examination (written)	**100%**

6.1 Missed Examinations

In the event that you miss an examination such as with serious illness, you are advised to contact both the Course Coordinator and the Chair of the Examinations Committee so that appropriate preparations can be made. Any decisions to enter a candidate for a supplementary exam will be at the discretion of the examinations committee and they will consider, for example, whether notification was made before or after the examination. Unless it is impossible, written contact should be made **before** the commencement of the exam providing proof of extenuating circumstances (for example, a doctor's certificate).

Lecture schedule / Content: Medicinal Chemistry II

Week/Lecture	Date	Content	Remarks
1/1 Wednesday 09:30 -10:30	18/01/2017	Chemotherapeutic agents – Dr Knott	
1/2 Thursday 09:30 – 11:30	19/01/2017	Chemotherapeutic agents – Dr Knott	
2/1 Monday 14:00 – 17:00	23/01/2017	Preparation of benzocaine – Ms K Amakali	
2/2 Wednesday 09:30 -10:30	25/01/2017	Chemotherapeutic agents – Dr Knott	
2/3 Thursday 09:30 – 11:30	26/01/2017	Chemotherapeutic agents – Dr Knott	
3/1 Monday 14:00 – 17:00	30/01/2017	Preparation of benzocaine (MP and HPLC analysis of product) – Ms K Amakali	
3/2 Wednesday 09:30 -10:30	01/02/2017	Chemotherapeutic agents – Dr Knott	
3/3 Thursday 09:30 – 11:30	02/02/2017	Chemotherapeutic agents – Dr Knott	
4/1 Monday 14:00 – 17:00	06/02/2017	Phenytoin: i Preparation of benzoin – Ms K Amakali	
4/2 Wednesday 09:30 -10:30	08/02/2017	Chemotherapeutic agents – Dr Knott	
4/3 Thursday 09:30 – 11:30	09/02/2017	Chemotherapeutic agents – Dr Knott	
5/1 Monday 14:00 – 17:00	13/02/2017	Phenytoin: ii Preparation of benzyl – Ms K Amakali	
5/2 Wednesday 09:30 -10:30	15/02/2017	Chemotherapeutic agents – Dr Knott	
5/3 Thursday 09:30 – 11:30	16/02/2017	Chemotherapeutic agents – Dr Knott	
6/1 Monday 14:00 – 17:00	20/02/2017	Phenytoin: iii Preparation of phenytoin – Ms K Amakali	
6/2 Wednesday 09:30 -10:30	22/02/2017	Analgesic drugs – Dr Knott	
6/3 Thursday 09:30 – 11:30	23/02/2017	Analgesic drugs – Dr Knott	

7/1 Monday 14:00 – 17:00	27/02/2017	Phenytoin: iv. MP, HPLC and IR analysis of product – Ms K Amakali	
7/2 Wednesday 09:30 -10:30	01/03/2017	Analgesic drugs – Dr Knott	
7/3 Thursday 09:30 – 11:30	02/03/2017	Analgesic drugs – Dr Knott	
8/1 Monday 14:00 – 17:00	06/03/2017	Analysis of benzocaine or phenytoin if needed – Ms K Amakali	
8/2 Wednesday 09:30 -10:30	08/03/2017	Hormonal systems – Dr Knott	
8/3 Thursday 09:30 – 11:30	09/03/2017	Hormonal systems – Dr Knott	
9/1 Monday 14:00 – 17:00	13/03/2017	Practical as per Ms K Amakali	
9/2 Wednesday 09:30 -10:30	15/03/2017	**Test on Dr Knott's work**	
9/3 Thursday 09:30 – 11:30	16/03/2017	Central Nervous system – Dr Knott	
	20-24/03/2017	**1st SEMESTER BREAK**	
10/1 Monday 14:00 – 17:00	27/03/2017	Practical as per Ms K Amakali	
10/2 Wednesday 09:30 -10:30	29/03/2017	Central Nervous system – Dr Knott	
10/3 Thursday 09:30 – 11:30	30/03/2017	Central Nervous system – Dr Knott	
11/1 Monday 14:00 – 17:00	03/04/2017	Practical as per Ms K Amakali	
11/2 Wednesday 09:30 -10:30	05/04/2017	Radiopharmaceuticals – Mr Ishola	
11/3 Thursday 09:30 – 11:30	06/04/2017	Radiopharmaceuticals – Mr Ishola	
12/1 Monday 14:00-17:00	10/04/2017	Practical as per Ms K Amakali	

12/2 Wednesday 09:30 -10:30	12/04/2017	Radiopharmaceuticals – Mr Ishola	
12/3 Thursday 09:30 – 11:30	13/04/2017	Radiopharmaceuticals – Mr Ishola	
13/1 **Monday** **14:00-17:00**	**17/04/2017**	**PUBLIC HOLIDAY**	
13/2 Wednesday 09:30 -10:30	19/04/2017	Radiopharmaceuticals – Mr Ishola	
13/3 Thursday 09:30 – 11:30	20/04/2017	Radiopharmaceuticals – Mr Ishola	
14/1 Monday 14:00-17:00	24/04/2017	Pharmaceutical Biotechnology	
14/2 Wednesday 09:30 -10:30	26/04/2017	Pharmaceutical Biotechnology – Mr Mavu	
14/3 Thursday 09:30 – 11:30	27/04/2017	Pharmaceutical Biotechnology – Mr Mavu	
15/1 **Monday** **14:00 – 17:00**	**01/05/2017**	**PUBLIC HOLIDAY**	
15/2 Wednesday 09:30 -10:30	03/05/2017	Pharmaceutical Biotechnology – Mr Mavu	
15/3 **Thursday** **09:30 – 11:30**	**04/05/2017**	**PUBLIC HOLIDAY**	
16/1 Monday 14:00 – 17:00	08/05/2017	Pharmaceutical Biotechnology	
16/2 Wednesday 09:30 -10:30	10/05/2017	Pharmaceutical Biotechnology – Mr Mavu	
16/3 Thursday 09:30 – 11:30	11/05/2017	Pharmaceutical Biotechnology – Mr Mavu	
16/1 **17/1**	**12/05/2017** **18/05/2017**	**Lectures end 1st Semester (Senior Students) (16 weeks)** **Regular Examination Commence (Senior BPharm Students)**	

Pharmaceutical Chemistry & Phytochemistry

Medicinal Chemistry I (PCMM3752A) - Semester 2 2016
No. of responses = 33 Response Ratio = 235.7%

Overall indicators

Global Index

av.=4.6
dev.=0.6

Teaching Administration (Scale width: 2)

av.=4.6
dev.=0.6

Teaching of the Subject Matter (Scale width: 5)

av.=4.5
dev.=0.7

Assessment (Scale width: 5)

av.=4.6
dev.=0.6

Student Support (Scale width: 5)

av.=4.7
dev.=0.5

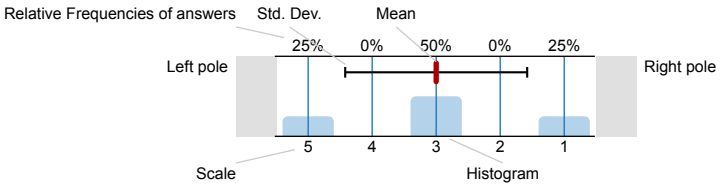
Professional Conduct (Scale width: 5)

av.=4.7
dev.=0.5

Survey Results

Legend

Question text

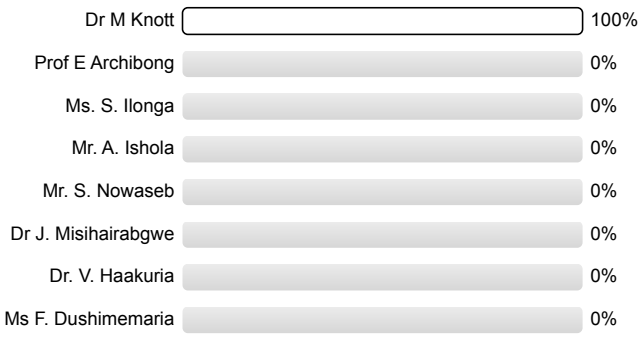


n=No. of responses
av.=Mean
dev.=Std. Dev.
ab.=Abstention

1. Lecturer's Name

1.1) Please select the name of the lecturer for this course (select only one)

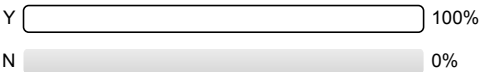
n=33



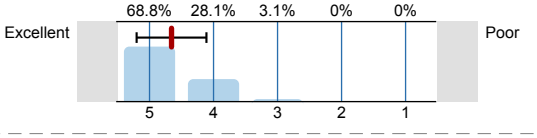
2. Teaching Administration

2.1) The Course outline was provided within the first week of the semester.

n=31

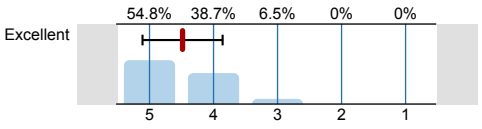


2.2) The course outline was clear, comprehensive and useful.



n=32
av.=4.7
dev.=0.5

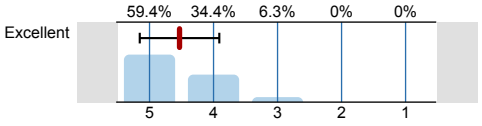
2.3) To what extent was the module outline clear, comprehensive and useful?



n=31
av.=4.5
dev.=0.6

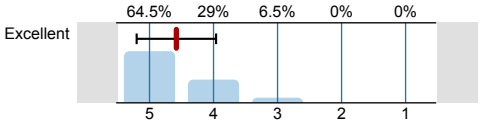
3. Teaching of the Subject Matter

3.1) The lecturer was prepared for classes.



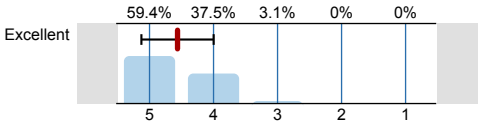
n=32
av.=4.5
dev.=0.6

3.2) The lecturer used class time effectively (the whole period).



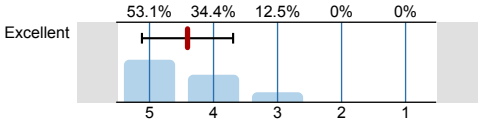
n=31
av.=4.6
dev.=0.6

3.3) The lecturer covered the curriculum topics as indicated in the course outline.



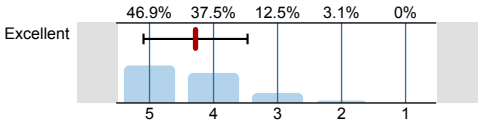
n=32
av.=4.6
dev.=0.6

3.4) The presentation of the subject matter was organized (systematic, clear and effective)



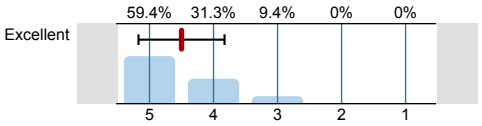
n=32
av.=4.4
dev.=0.7

3.5) The lecturer used a variety of teaching methods and visual aids, to make the course interesting, easy to follow, and rewarding.



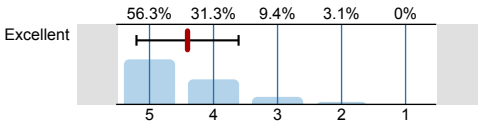
n=32
av.=4.3
dev.=0.8

3.6) The lecturer encouraged interactions with students.



n=32
av.=4.5
dev.=0.7

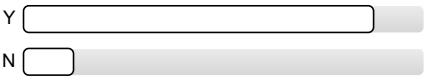
3.7) The lecturer gave you an opportunity to discuss and improve the module.



n=32
av.=4.4
dev.=0.8

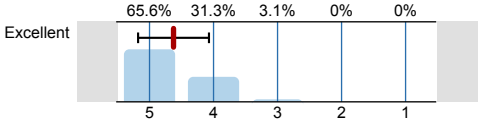
4. Assessment

4.1) The lecturer gave at least two evaluation opportunities.



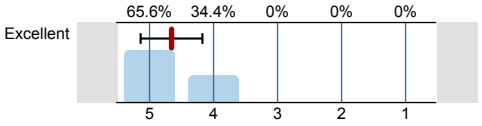
n=32

4.2) The lecturer gave clear instructions for tests and other assessments.



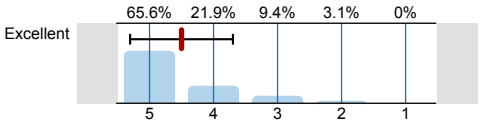
n=32
av.=4.6
dev.=0.6

4.3) The lecturer marked the scripts within a reasonable timeframe.



n=32
av.=4.7
dev.=0.5

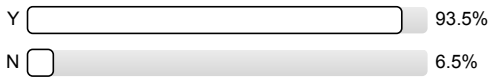
4.4) The lecturer provided helpful feedback on assignments and tests.



n=32
av.=4.5
dev.=0.8

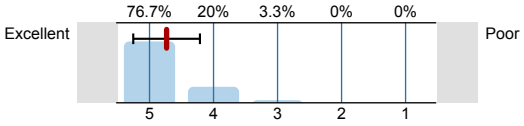
5. Student Support

5.1) The lecturer displayed consultation hours on his / her door.



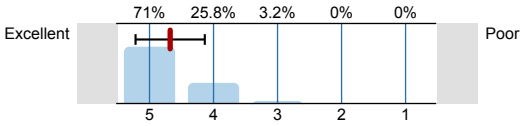
n=31

5.2) The lecturer was available during consultation time.



n=30
av.=4.7
dev.=0.5
ab.=2

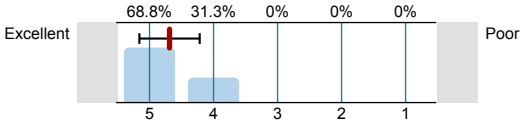
5.3) The lecturer treated you humanely and with respect.



n=31
av.=4.7
dev.=0.5
ab.=1

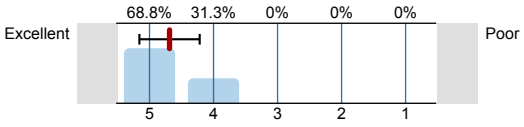
6. Professional Conduct

6.1) The lecturer turns up for classes regularly.



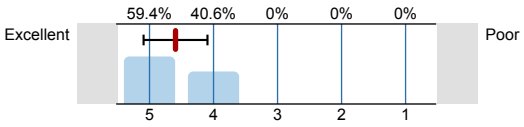
n=32
av.=4.7
dev.=0.5

6.2) The lecturer was on time for classes.



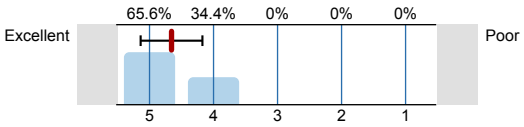
n=32
av.=4.7
dev.=0.5

6.3) The lecturer made arrangements well in advance when absent from a class.



n=32
av.=4.6
dev.=0.5

6.4) Your general impression of the lecturer in terms of professional behavior.



n=32
av.=4.7
dev.=0.5

Profile

Subunit: FHS Pharmaceutical Chemistry & Phytochemistry
Name of the instructor: Pharmaceutical Chemistry & Phytochemistry
Name of the course: (Name of the survey) Medicinal Chemistry I (PCMM3752A)

Values used in the profile line: Mean

2. Teaching Administration

2.2)	The course outline was clear, comprehensive and useful.	Excellent	Poor	n=32 av.=4.7 md=5.0 dev.=0.5
2.3)	To what extent was the module outline clear, comprehensive and useful?	Excellent	Poor	n=31 av.=4.5 md=5.0 dev.=0.6

3. Teaching of the Subject Matter

3.1)	The lecturer was prepared for classes.	Excellent	Poor	n=32 av.=4.5 md=5.0 dev.=0.6
3.2)	The lecturer used class time effectively (the whole period).	Excellent	Poor	n=31 av.=4.6 md=5.0 dev.=0.6
3.3)	The lecturer covered the curriculum topics as indicated in the course outline.	Excellent	Poor	n=32 av.=4.6 md=5.0 dev.=0.6
3.4)	The presentation of the subject matter was organized (systematic, clear and effective)	Excellent	Poor	n=32 av.=4.4 md=5.0 dev.=0.7
3.5)	The lecturer used a variety of teaching methods and visual aids, to make the course interesting, easy to follow, and rewarding.	Excellent	Poor	n=32 av.=4.3 md=4.0 dev.=0.8
3.6)	The lecturer encouraged interactions with students.	Excellent	Poor	n=32 av.=4.5 md=5.0 dev.=0.7
3.7)	The lecturer gave you an opportunity to discuss and improve the module.	Excellent	Poor	n=32 av.=4.4 md=5.0 dev.=0.8

4. Assessment

4.2)	The lecturer gave clear instructions for tests and other assessments.	Excellent	Poor	n=32 av.=4.6 md=5.0 dev.=0.6
4.3)	The lecturer marked the scripts within a reasonable timeframe.	Excellent	Poor	n=32 av.=4.7 md=5.0 dev.=0.5
4.4)	The lecturer provided helpful feedback on assignments and tests.	Excellent	Poor	n=32 av.=4.5 md=5.0 dev.=0.8

5. Student Support

5.2)	The lecturer was available during consultation time.	Excellent	Poor	n=30 av.=4.7 md=5.0 dev.=0.5
5.3)	The lecturer treated you humanely and with respect.	Excellent	Poor	n=31 av.=4.7 md=5.0 dev.=0.5

6. Professional Conduct

6.1)	The lecturer turns up for classes regularly.	Excellent	Poor	n=32 av.=4.7 md=5.0 dev.=0.5

6.2)	The lecturer was on time for classes.	Excellent	Poor	n=32 av.=4.7 md=5.0 dev.=0.5
6.3)	The lecturer made arrangements well in advance when absent from a class.	Excellent	Poor	n=32 av.=4.6 md=5.0 dev.=0.5
6.4)	Your general impression of the lecturer in terms of professional behavior.	Excellent	Poor	n=32 av.=4.7 md=5.0 dev.=0.5

Profile

Subunit: FHS Pharmaceutical Chemistry & Phytochemistry
Name of the instructor: Pharmaceutical Chemistry & Phytochemistry
Name of the course: (Name of the survey) Medicinal Chemistry I (PCMM3752A)

Teaching Administration (Scale width: 2)	- +	av.=4.6	dev.=0.6
Teaching of the Subject Matter (Scale width: 5)	- +	av.=4.5	dev.=0.7
Assessment (Scale width: 5)	- +	av.=4.6	dev.=0.6
Student Support (Scale width: 5)	- +	av.=4.7	dev.=0.5
Professional Conduct (Scale width: 5)	- +	av.=4.7	dev.=0.5

Comments Report

7. General comments

7.1) What is one thing that the lecturer does well?

Very interactive

Interacts well with class

Eventhing

~~Teaching method~~ assessments

N/A

The lecturer explains the concept.

Delivers lecture content very well

N/A

Lecturer is very interactive.

Explanation with examples

- Always punctual and gives clear instructions about tests and assignment

Teaches very well.

THE LECTURER WAS ORGANISED

Conveys his knowledge to students very well
Good interaction with the students.

All work content ~~well~~ was well explained.

Answers Questions. Helps alot.

ALWAYS PREPARED

He uses variety of teaching modes

lecture

Well explained lectures

Time - management

Letting students read out answers in class. This helps with participation

7.2) What is one thing that you can suggest to help this lecturer improve?

Must not repeat test papers, different group's (years) different set of questions

N/A

he must improve the teaching method

N/A

N/A

N/A

Nothing

Keep up the good work

Nothing

THE LECTURER SHOULD ~~KEEP DOING~~ CONTINUE BEING ORGANISED

nothing

NEEDS TO EXPLAIN MORE

N/A

No, everything was good

Nothing really. he is Okeee.

N/A

N/A

7.3) Highlight the key things you learnt in this module.

Alot, it's an interesting Module, no doubt

All concepts were well understood

phase I & II metabolism

N/A

Has to manage Paracetamol overdose

N/A

Drug optimization

Optimizing drug interactions

Drug interactions

DRUG DISCOVERY, DRUG METABOLISM

Drug design steps

Drug optimisation techniques

Drug Metabolism

drug - discovery design

Optimising drug interaction for PD & PK properties

Drug Design Development
Drug Metabolisms

Pharmaceutical applications.

Process of drug design.

Phase I and phase II metabolism

7.4) What would you improve about this module?

The module in well organized & constructed.

N/A

Stop reading slides and teach

N/A

N/a

N/A

More time during exam.

The Module is well organised but communication about labs need to be ~~well~~ strengthened further.

N/A

Nothing

More tutorials

~~N/A~~ TEACHING

N/A

No, everything was good.

Nothing

N/A

N/A

Appendix 5 - Observation form

UNIVERSITY OF NAMIBIA

FACULTY OF EDUCATION

2017 - OBSERVATION FORM

(To be completed by the PDHE students for Teaching Practice in Higher Education Requirement)

OBSERVE AT LEAST TWO LESSONS IN YOUR DISCIPLINE OFFERED BY OTHER LECTURERS, before you invite another lecturer to observe your teaching. Complete the form after each lecture that you have observed. Observe two lessons and get two records of another lecturer observing you for the entry to the Integrated Professional Portfolio using the other form.

Module/Course 1: PHARMACY PRACTICE

TOPIC	Programme Year Level	Name of Lecturer	Signature of Lecturer
1. PHARMACY PLACEMENT.	2	PROF RENNIE	
2.			
3.			
4.			
5.			
6.			

Module/Course 2: PHARMACY PRACTICE

TOPIC	Programme Year Level	Name of Lecturer	Signature of Lecturer
1. PHARMACY OWNERSHIP	2	MS LATES (CO-ORDINATOR)	
2.			
3.			
4.			
5.			
7.			

Identify **one** of these observed lessons and respond to the following questions:

Date: 1/1/17 **Year Level** 2 **Name of Module Observed:** PHARMACY PLACEMENT

Area 1	**How did the lecturer start the lesson**? Tie it to the previous learning? Arouse learners' interest? Yes, he spoke about his experiences in the workplace.
Area 2	**How did the lecturer make the purpose and relevance of the lesson apparent?** By making direct statements? By eliciting reactions from learners? Other? Yes, he asked the students about their expectations and what they enjoy doing.
Area 3	**What procedures were incorporated into the body of the lesson?** Lecture? Discussion? Audio-visual presentation? Demonstration? Learner activities? Discussion
Area 4	**What materials were used in the course of the lesson?** Textbooks? Computers? Concrete objects? OHP? Other (Specify)? None
Area 5	**What was the lecturer's style of teaching?** Direct? Indirect? Friendly, enthusastic, confident, easy to approach, caring
Area 6	**Did the lecturer show a broad knowledge of the subject a**rea? Did the lecturer stick to the textbook or bring in information from other sources as well? Did the lecturer relate the subject matter to other content the learners had studied, to current events, or to learners' personal interest? Yes he demonstrated a broad knowledge and was able to interweave different topics successfully & interestingly

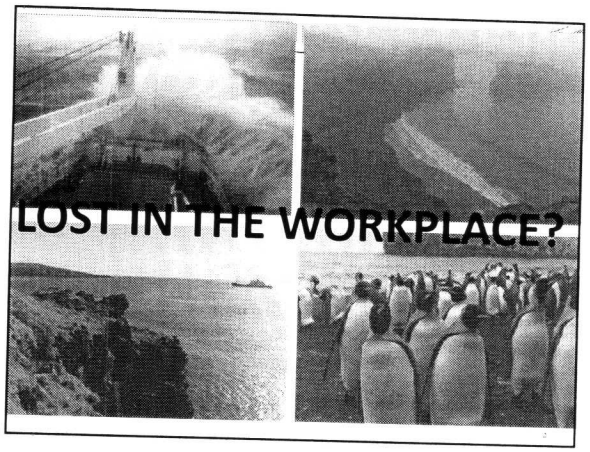
	Excellent discussion based session Was able to relate to the students and their problems within the context of Namibia.
Area 7	**What provisions were made for individual differences**? Small-group work? Individualized assignments? Differentiated reading material? Other (Specify)? None
Area 8	**What disciplinary techniques did the lecturer use?** Penalty points? Deprivation of privileges? Reward system? Time-out? Other (Specify) None needed
Area 9	**How did the lecturer's personal qualities help advance the lesson?** Dressed appropriately? Displayed no distracting mannerisms? Used correct grammar? Used appropriate voice volume and pitch? Excellent use of English Very approachable Very likeable Caring, respect understanding
Area 10	**How did the lecturer end the lesson?** Summarized the day's learning? Learning Tasks or Assignment homework (if so, specify the kind of assignment)? Other (Specify)? Yes - he summarized the discussion and prepared the students well for what to expect in the real world
Area 11	**What evaluation techniques did the lecturer use in the course of the lesson?** Oral questions? Written questions? Observation of learners' verbal responses? Observation of learners' application skills? Other (Specify)? Oral questions to make sure students are listening & learning

Expectations of the employer

Michael G. Knott

School of Pharmacy, University of Namibia, Private Bag 13301, 340 Mandume Ndemufayo Avenue, Pionierspark, Windhoek, Namibia, 9000

*Corresponding author. Email: mknott@unam.na (M.G. Knott)



Outline

- Background, relevance and prior knowledge
- Objectives
- Expectations of the employer
- Summary
- Questions
- Homework

Background, relevance and prior knowledge

- Employers look for people they think will help the company succeed. Employers will hire people who will most likely meet or exceed expectations.
- Employers will go to great lengths to get a good understanding of who you are.
- Employers will judge you based on your first impression, so make it a good one!

- Employers want to know the answers to two primary questions: Can you do the job? Will you do the job?
- In addition to your skills and abilities, employers want to know you have good work ethic to work successfully and add value to their team.

Objectives

- To understand and demonstrate the expectations of the employer in a community pharmacy setting.

Expectations of the employer

- Positive Attitude
- Dependability
- Continual Learning
- Initiative
- Co-operation

7

Expectations of the employer in a community pharmacy setting

8

Hidden YES/ NO questions

- Always be on time?
- Behave in a professional manner?
- Ask questions and learn?
- Ignore customers?
- Make money for the pharmacy?
- Clean the shelves?
- Be left alone to run the pharmacy?
- Dispense prescriptions without supervision?
- Count schedule 6 drugs?

9

Hidden YES/ NO questions

- Cleaning the mortar and pestle?
- Do calculations and prepare medicines alone?
- Deliver prescription medicine to a person's house?
- Prepare a patient information leaflets?
- Remain calm when someone shouts at you?
- Uphold the law?
- Make tea and coffee if required?
- Build trusting relationships with people in the community?
- Be helpful and caring?
- Unpack boxes?
- Fetch change from the bank?

10

SUMMARY

Even though employers and employees bring their own expectations to the workplace, high performance occurs when these expectations are blended together. Blending the expectations between the employer and employee is done through communication. Two-way dialogue ensures each party has a voice.

11

Questions?

12

Homework

- **Look through the expectation prism from the employer's perspective.**
- For example, pretend you are the boss of a busy community pharmacy and make of list of what you would expect from your staff (before you start your placement)...

13

Appendix 7 - Lecture plan form

UNAM
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FACULTY OF EDUCATION

LESSON PLAN FORM

SURNAME: KNOTT ***INITIALS :*** MG ***STUDENT NO.:*** 201614321

STUDY COURSE: ADHE ***SCHOOL:*** PHARMACY ***DATE:*** 25/10/17

SUBJECT: PHARMACY PRACTICE ***GRADE:*** — ***TIME:*** 10:30

LESSON TOPIC: EXPECTATIONS OF THE EMPLOYER

ASSESSOR SCORE: 18 / 20

ASSESSOR NAME & SIGNATURE: TIM RENNIE

A. PRE-PRESENTATION COMPONENT

1. LEARNERS' PRIOR KNOWLEDGE (relevant to the topic)

LEARNERS WERE ASKED ABOUT THEIR PRIOR EXPERIENCE IN COMMUNITY PHARMACIES AND TOLD TO SHARE THEIR STORIES WITH THE CLASS

2. BASIC COMPETENCIES (Indicate Syllabus Reference):

Learners should be able to

(a) UNDERSTAND AND DEMONSTRATE THE EXPECTATIONS OF THE EMPLOYER IN A COMMUNITY PHARMACY SETTING

(b)

(c)

3. LEARNING AND TEACHING RESOURCES TO BE USED

- POWERPOINT PRESENTATION WITH PROJECTOR (AND LASER POINTER)
- LECTURER WITH REAL LIFE EXPERIENCE AS A PHARMACY OWNER
- TEXTBOOK ON PHARMACY MANAGEMENT SUGGESTED

B. PRESENTATION COMPONENT

Describe in each phase exactly ***what content*** is involved and ***how*** you will facilitate the learning.

1. MONITORING OF HOMEWORK DONE

NOT APPLICABLE AS A GUEST LECTURER

2. INTRODUCTION TO THE LESSON

GAIN THE ATTENTION OF THE CLASS BY ~~MA~~ MEANS OF A STRIKING PICTURE OF A SHIP IN A STORM AND PENGUINS! BOLD TITLE "LOST IN THE WORKPLACE?"

3. PRESENTATION OF SUBJECT CONTENT AND LEARNING TASKS

- OUTLINE OF PRESENTATION (IE BACKGROUND, RELEVANCE, PRIOR KNOWLEDGE, OBJECTIVES, EXPECTATIONS OF THE EMPLOYER, SUMMARY, QUESTIONS, HOMEWORK)
- BACKGROUND, RELEVANCE AND PRIOR KNOWLEDGE (CLASS DISCUSSION)
- OBJECTIVES
- EXPECTATIONS OF THE EMPLOYER (GENERIC CHARACTERISTICS)
- " " " " (IN A COMMUNITY PHARMACY) - I ASKED A NUMBER OF PHARMACY RELATED QUESTIONS WITH YES AND NO ANSWERS. FULL CLASS PARTICIPATION WAS REQUIRED WITH EACH STUDENT DEMONSTRATING YES OR NO. (SNAKES & LADDERS)
- SUMMARY OF WHAT WAS LEARNED FOLLOWED BY QUESTIONS

4. CONSOLIDATION OF THE LESSON

STUDENTS WERE GIVEN A CHANCE TO ASK QUESTIONS AND DISCUSS KEY CONCEPTS OF EMPLOYER EXPECTATIONS.

5. ASSESSMENT/HOMEWORK/TASKS/EXERCISES

STUDENTS WERE ASKED TO LOOK THROUGH THE EXPECTATION PRISM FROM THE EMPLOYERS PERSPECTIVE.
FOR EXAMPLE PRETEND THAT YOU ARE THE BOSS OF A BUSY COMMUNITY PHARMACY AND MAKE A LIST OF WHAT YOU WOULD EXPECT FROM YOUR STAFF.
COMPARE THIS LIST TO YOUR OWN BEHAVIOUR DURING YOUR COMMUNITY PHARMACY PLACEMENT.

C. POST-PRESENTATION COMPONENT

After the lesson presentation describe how would you determine whether the outcomes were achieved by the learners.

REFLECTION
Reflection is a process of self-evaluation that effective teachers regularly perform or engage in to improve their teaching or professional practices.
1. As I reflect on the lesson, to what extent were learners productively engaged? Describe.
VERY ACTIVE ENGAGEMENT. OVER 20 PHARMACY RELATED QUESTIONS WERE ASKED ABOUT WHAT TO EXPECT IN A COMMUNITY PHARMACY. STUDENTS WERE ASKED TO STAND UP. STUDENTS PLACED THEIR HANDS ON THEIR HEAD IF THE ANSWER WAS NO AND HANDS ON BUMS IF ANSWER WAS YES. IF THEY GOT THE ANSWER WRONG THEY WERE TOLD TO SIT DOWN.
2. Did the learners learn what I intended? Were my objectives met? How do I know? (Describe the evidence.)
YES - DIRECT QUESTIONING WAS USED (AS BOTH A METHOD OF LEARNING AND INDIRECT ASSESSMENT)
3. Was there a need for me change my lesson objectives or lesson plan as I taught the lesson? If so, why?
NO - THE LESSON OBJECTIVES AND LESSON PLAN WORKED WELL
4. If I had the opportunity to teach this lesson again to the same group of learners, what could I do differently to improve the lesson? Why?
PERHAPS NEXT TIME I WILL ASK EVEN MORE QUESTIONS AND ALSO HAVE A PRIZE FOR THE LAST STUDENT STANDING. THIS WILL INCREASE BOTH DEPTH AND MOTIVATION EVEN FURTHER

Appendix 8 - Lecturer observation form

LECTURER OBSERVATION FORM

Surname: KNOTT Initials: M Staff No.: 100973

Study Course: PgDHE Year 2 Module —

Date: 1/11/17 Time: 1030 Assessor's Name & Signature: TIM RENNIE

GRADING:

FINAL GRADE %	A (80-100)	B (70-79)	C (60-69)	D (50-59)	E (Below 50)
90					

RATING:

A	Demonstrated excellent competence of the criterion
B	Demonstrated advanced competence of the criterion
C	Demonstrated above average competence of the criterion
D	Demonstrated average/satisfactory competence of the criterion
E	Demonstrated insufficient competence of the criterion

For each criterion, tick the box (A-E) that best describes the lecturer's competence in that criterion. Evaluate the lecturers' overall competence in each section (1-9). Making use of the ticks as a guideline, use the rating scale for each section to guide you in allocating a grade for that section. Add all the grades to determine the final grade.

EVALUATION CRITERIA	RATING SCALE					GRADE	COMMENTS
	A	B	C	D	E		
1. LESSON PLAN & PREPARATION:	12-15	10-11	9	8	0-7	15 (14)	Well prepared, thoughtful & organised – hard to fault.
a) Appropriate objectives developed i.t.o [1] of topic	✓						
b) Attainable competencies indicated	✓						
c) Content described in detail	✓						
d) Appropriate teaching strategies indicated	✓						
e) Appropriate learning strategies indicated	✓						
f) Resources identified and available for use	✓						
g) Appropriate assessment strategies indicated i.t.o attainment of competencies	✓						
2. LESSON INTRODUCTION (5)	5	4	3	2	0-1	5 (4)	Caught attention with a good opening question -> who has worked in a community planning? Also, highlighted the
a) Gained immediate interest							

b) Linked up with students' prior knowledge							Significance of placement for future employment. Could have followed up to see what those students had done.
c) Clarified objectives for lesson							
d) Creative introduction							
3. LESSON PRESENTATION (25)	20-25	18-19	15-17	13-14	0-12	20 (18)	Could have linked with previous placement?
a) Presented content in a logical sequence							
b) Made insightful use of subject knowledge							Great interactive exercise!
c) Used a variety of relevant learning and assessment tasks to develop students thinking skills							Great to deal with expectations.
d) Communicated with all students							
e) Patient with, interested in, listening to students							
f) Demonstrated good questioning skills							
g) Included open/higher level questions							
h) Praised and corrected answers to questions/learning efforts							Encouraged note taking to improve interaction.
i) Sensitive to gender, ability, special needs and individual differences of students							
j) Students engaged in active learning							
k) Student-centered activities used							
l) Positive methods of reinforcement							
m) Summary of main ideas and conclusion given							
4. SUBJECT KNOWLEDGE (15)	12-15	10-11	9	8	0-7	15 (10)	Would definitely have liked to have heard about MK's experiences and a few anecdotes as a community pharmacist.
a) Demonstrated an understanding of subject knowledge							
b) Related knowledge to life situations and other subjects							
c) Developed the thinking and values of students							
d) Used own subject knowledge							
5. COMMUNICATION SKILLS (12)	10-12	8-9	7	6	0-5	(12)	Cannot fault
a) English usage was proficient							
b) Spoke clearly with a varied tone							
c) Appropriate non-verbal communications skills used effectively							
d) Communicated with all sectors of the class							
6. TEACHING AND LEARNING MEDIA (8)	7-8	6	5	4	0-3	(8)	Cannot fault
a) Varied use of creative and appropriate media							
b) Effective and skillful use of teaching/ learning media							
7. LECTURE ROOM MANAGEMENT (10)	8-10	7	6	5	0-4	(10)	Cannot fault.

a) Implemented orderly procedures for students entrance, leaving, participation							
b) Maintained discipline assertively							
c) Organized physical conditions well							
d) Created a democratic atmosphere							
e) Managed time effectively							
8. ASSESSMENT (10)	8-10	7	6	5	0-4	**10** (9)	Maybe could have probed for student questions more?
a) Assessed students' understanding continuously							
b) Used constructive probing of students' knowledge and understanding							
c) Appropriate feedback provided							
d) Provided exercises for practice/homework give							
9. GENERAL IMPRESSION OF LECTURER (5)	5	4	3	2	0-1	(5)	Cannot fault.
a) Demonstrated confidence and enthusiasm for teaching							
b) Appeared friendly and caring towards students							
c) Demonstrated emotional maturity and responsibility							
d) Appropriately dressed and groomed							

1. i.r.t. = in regard to

Appendix 9 – Part of the Medicinal Chemistry II exam

FACULTY	HEALTH SCIENCES	SCHOOL OF PHARMACY	
DEGREE	B.PHARMACY (HONS) YEAR IV		
DEPARTMENT	Pharmaceutical Chemistry and Phytochemistry		
MODULE	Medicinal Chemistry II		
MODULE CODE	PCMM 3871		
DATE	TBC	**TIME:**TBC	
DURATION	THREE (3) HOURS	**MARKS**	100 Marks

FIRST OPPORTUNITY SEMESTER I EXAMINATION

Examiner: Dr. Michael Knott

Second examiner: Mr. Anthony Ishola and Dr. Vetja Haakuria

External Moderator: Prof. Jacques Petzer

This question paper consists of XX pages including this front page.

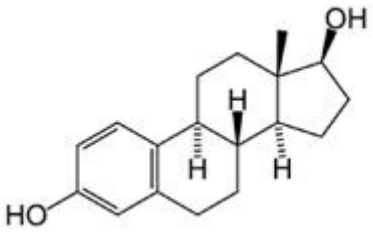
Instructions

1. **Write your STUDENT NAME and NUMBER *clearly* in the spaces provided on each page**
2. **Read each question carefully before answering**
3. **There are three sections in this examination - answer ALL questions in all sections**
4. **Write ALL your answers in the answer booklet provided**
5. **Any form of malpractice is unacceptable**

UNIVERSITY OF NAMIBIA EXAMINATIONS

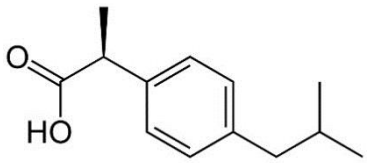
<u>Section A:</u> Multiple choice questions – mark ONE correct answer only (15 marks) – answer all questions

1. The following structure is a hormone. It would be best classified as;



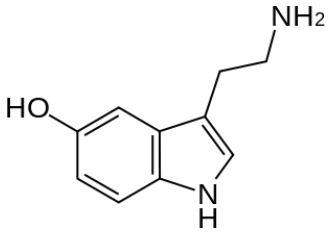
   a) an oestrogen
   b) a progestin
   c) an androgen
   d) a gonadotropin
   e) an adrenocorticosteroid

2. The following structure is that of an NSAID. Which NSAID is it?



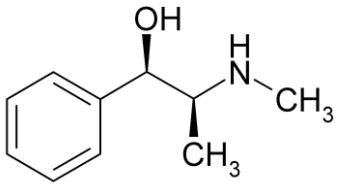
   a) Indomethacin
   b) Mefenamic acid
   c) Ibuprofen
   d) Piroxicam
   e) Coxflam

3. Which neurotransmitter does the following structure represent?



   a) Dopamine
   b) Serotonin
   c) Epinephrine
   d) Acetylcholine
   e) Norepinephrine

4. Which phenylethylamine compound does the following structure represent?



a) Ephedrine
b) Methamphetamine
c) Tyramine
d) Salbutamol
e) Dopamine

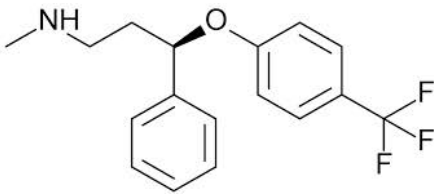
5. Why is azithromycin more acid stable than erythromycin?

a) Ring expansion between carbons 9 and 10
b) Ring expansion between carbons 8 and 9
c) Ring expansion between carbons 7 and 8
d) Ring expansion between carbons 6 and 7
e) Ring expansion between carbons 5 and 6

6. Clarithromycin differs from erythromycin in that the C-6 OH group has been converted semi-synthetically to a…..

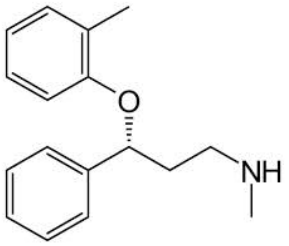
a) methyl ether
b) methyl ester
c) methyl amine
d) methyl amide
e) methyl aldehyde

7. What is the name of the following phenoxyphenylalkylamine?



a) Paroxetine
b) Citalopram
c) Duloxetine
d) Fluoxetine
e) Sertraline

8. The following compound is that of atomoxetine (Strattera®) and is often used to treat attention deficit hyperactivity disorder (ADHD), this structure maybe classified as a….



a) Phenoxphenylpropylamine
b) Phenoxyphenylalkylamine
c) Phenylalkylamine
d) Phenylethylamine
e) Phenylalkylamide

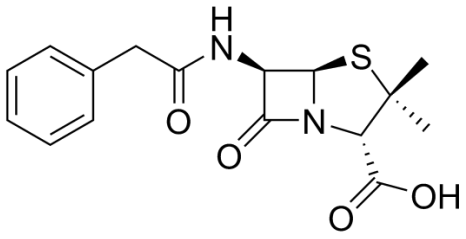
9. Tricyclic anti-depressants are structurally related to certain types of …..

a) Atypical antipsychotics
b) Typical antipsychotics
c) 3rd generation antihistamines
d) Benzodiazepines
e) Barbiturates

See over for section B

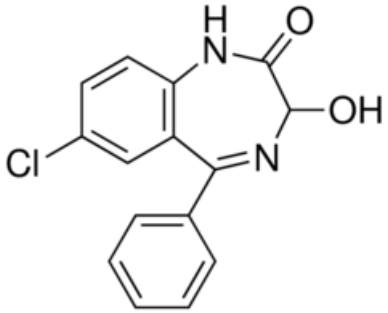
Section B: Short answer questions (25 marks) - answer all questions in this section

1. Penicillin G has a narrow spectrum of activity. Using a diagram, explain why this is the case, and in addition, find a solution to this problem. [4]



Pen G

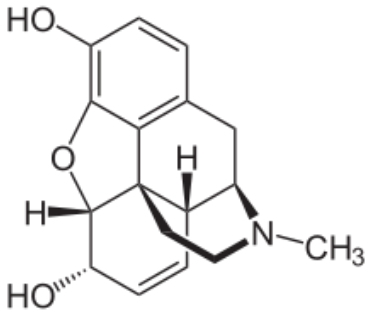
2. Briefly list the structure activity relationships (SAR's) associated with benzodiazepines. [4]



Oxazepam

3. Highlight the key structural features of fentanyl and diphenoxylate and how both these compounds where derived from the same parent compound.

[3]



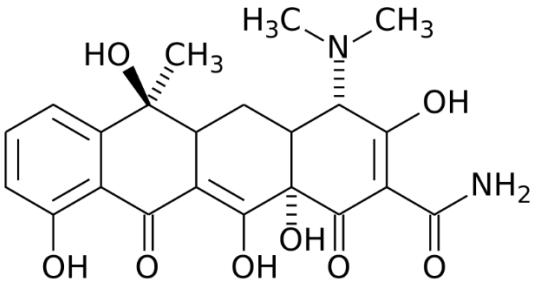
Morphine

See over for section C

Section C: (60 marks) - answer all questions in this section

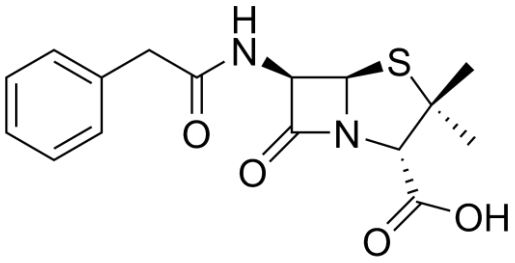
1. Certain expired tetracyclines are able to cause a Fanconi-like syndrome; which is a disease of the proximal renal tubule of the kidney in which glucose, amino acids, uric acid, phosphate and bicarbonate are passed into the urine, instead of being reabsorbed. Explain using mechanisms and words why expired (or old) tetracyclines should be discarded.

   Hint – this essay must explain the process of stereochemistry and epimerisation, as well as dehydration… [9]



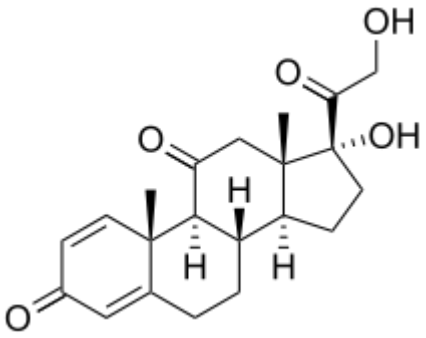
Tetracycline

2. List and explain three different reasons why is Pen G so acid sensitive? In addition, what can be done to improve acid stability? [8]



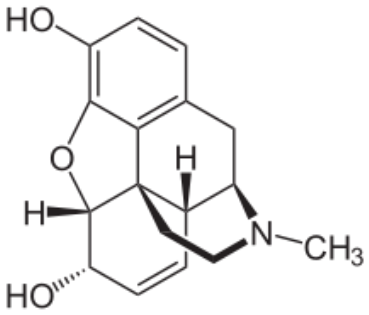
Pen G

3. List the SAR's of adrenocorticosteroids in terms of attempts to increase glucocorticoid activity while decreasing mineralocorticoid activity (give examples when possible). [8]



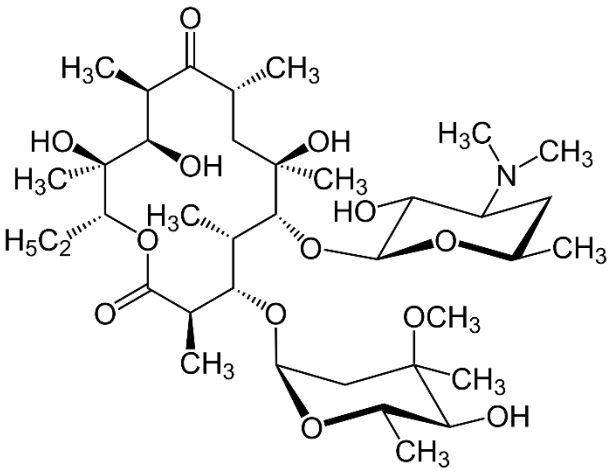
Prednisone

4. Discuss the structure activity relationships (SAR's), as well as attempts to increase analgesic activity whilst decreasing the side effects of morphine and its derivatives, giving suitable examples wherever possible. [10]



Morphine

5. Macrolides of the erythromycin class are chemically unstable in acid due to rapid internal cyclic ketal formation leading to inactivity. This reaction is believed to be clinically important. Draw the mechanism of this reaction, as well as describe TWO possible solutions to minimise this reaction from taking place. [5]



Erythromycin