

# 1. GETTING STARTED



***The fact that you have opened this book shows that you are interested in going to university. But what does that mean? Why would that be one of the best decisions you will make in your entire life?***

The word “university” derives from the same Latin word as “universe” – the whole of creation. At university, a whole new world will open up to you, and you will be able to study parts of it. University life will take you on a journey of discovery of something bigger than yourself, something far bigger than the world you have known thus far in your life and in your experience.

In the first place, the university experience will let you **discover more about yourself**: personally, emotionally, spiritually and physically. One day, when you look back on this phase of your life, you will probably say that these were the greatest, happiest and most important forming years of your life. You will form lifelong friendships and will probably also meet your life partner.

In the second place, university will let you **discover more about the world**. Not only will you add immensely to your knowledge about nature, human beings and the world in general (“facts”), but you will also learn how to perceive life, history and the world in general (“perspective”). After university life has come to an end, you would be able to understand the world (the universe) as an interrelated system, something that will be invaluable on your life’s journey.

In short: university life will allow you to learn more about yourself and the world. It will allow you to grow into a mature adult that can use knowledge responsibly by contributing to the improvement of our world.

## DISCOVERING MORE ABOUT YOURSELF

### **A new living environment**

Whether you are going to live in a university residence, or in a flat or in a student commune, you will experience a new living environment. Perhaps for the first time in your life, you will live among new and different people.

Sharing a room or a flat might be a new experience for you. For instance, not to listen to your music too loudly so as to disturb a roommate, will need a new measure of courteousness (yes, even an iPod can be too loud!). You may of necessity have less privacy than you have had in your parents’ house. This will take some getting used to, especially if you have never lived in a residence. In most cases you can’t choose your roommate and you have to learn to live with someone you (initially) don’t know at all. This is mostly a steep learning curve. In

addition, most residences have rules (some of which may seem strange at first) that first year students must learn to understand. Life is the same everywhere: newcomers must adapt to their environment, and not the other way around. How you adapt to all of this, will teach you a lot about yourself ...

In short, your place of residence will be quite different from your parents' house. Adapting to this may be easy for some, but difficult for others. The best way to manage this is to approach these changes with an open mind, and make the best of it. This is also part of your self-discovery.

### **A new study environment**

A totally different aspect of university life is the routine of attending lectures, and the novelty of "free" time during the day. What you do with the time when you don't have lectures, is very important. You can use it to study in the library or your room; you can use it to socialise with your friends and to have a cup of coffee. But the most important thing – and something that requires some self discipline – is to prepare for your next lecture!

### **A new social environment**

Perhaps the most important change is the intensive social experience that awaits you. You will come into contact with many more people than you used to do at school. These include other students in your residence, commune or flat, students who take the same course as you, student leaders and lecturers. Most university residences or societies have a strong sense of cohesion. Your participation in sport or cultural activities will also create a sense of social cohesion. All of this forms the nucleus of university social life and will let you discover the social side of your personality. You will have the opportunity to meet and get to know new people and forge strong friendships.

This, however, causes you to face certain crucial choices, especially who you choose to make friends with. It can happen that a student makes the wrong choices in friends, and that those friendships ruin a study career or even one's whole life. The same applies to relations with the opposite sex. Experience has shown that a high percentage of people who studied at university chose their life partners during their time of study. And this choice is fundamentally influenced by your circle of friends in your first year.

You also will be given the opportunity to participate in sport and cultural activities. It is important to take part in at least one sport or cultural activity. It immediately broadens your circle of potential friends and is an important

builder of character. Just think of how difficult (but important!) it was at school to process losing a match or coming last in the competition of the debating society! And yet, sport and culture are great builders of a sense of belonging at university.

The discovery of social life at university is perhaps one of the most important and unique experiences that awaits you. For a few years you are pitched into a social cauldron with thousands of other students, like nowhere else in life. This can make you a better, more mature and wiser person – if you use the experience correctly.

In this regard, for some students, a new **experience of diversity** awaits. Although you may find that you have a lot in common with quite a number of fellow students, it is also true that you will be different from many. This "being different" may apply to race, language, gender, culture or religious views (to name but a few).

To be exposed to diversity has important educational value. South Africa has been called the "rainbow nation" and boasts eleven official languages! Therefore it is important for students to have contact with other parts of the (same) rainbow, because you will in later life work and live in that rainbow country. Many different languages can be heard on all university campuses throughout South Africa, some from Africa and quite a few from further abroad. The diversity experience at university is not limited to race, language and culture, but also includes political and religious beliefs.

It is important that one approaches the diversity experience with an open mind, without necessarily forfeiting your own views. Just as pebbles in a river mould and shape one another, so one person moulds and shapes the other. Your contact with students from diverse backgrounds is an important part of your educational experience for life.

In this regard, the Bill of Rights is important. One should approach diversity with respect, and in a spirit of equality and tolerance. Even though you may not agree with the view points and actions of others, you should leave room for diverse views and actions (within the boundaries of the law, of course!). It is also important to know what you believe and why you believe. This is again part of your self-discovery.

## DISCOVERING MORE ABOUT THE WORLD

While discovering new aspects about yourself and your interaction with other people, there is another aspect to university life that is even more life-changing. You will, in a very short space of time, discover more about the world around you than you thought possible.

### Discovering masses of new knowledge and information

University is per definition a place where knowledge is generated, either as existing knowledge being transferred and studied or as new knowledge being explored. You will be amazed that you will, in a short time at university, learn more than during your whole school career! In some subjects you will have not only one, but several handbooks, supplemented by study guides.

It is important to remember that at university you will have to study by yourself. No more teachers and spoon-feeding of knowledge! Some universities use the term teaching-learning. The lecturer still “teaches” and leads, but the student must learn and study – especially given the massive amount of knowledge and information available electronically. Your knowledge experience will therefore also be a learning experience.

It is also important to remember that due to the “knowledge explosion” in the world today, one’s learning gets dated very quickly. Even though it may sound strange, you will, in the first few months of your employment again learn more in a short time than all the years at university! You are at university to learn how to learn, how to apply knowledge, how to solve problems – because this is what will be expected of you later in life. Remember that the tests and exams are simply ways to ascertain whether you have mastered this.

And in this regard, even though you have written and passed your matric exam recently, you will be confronted by how little you really know. You will experience an information “overdose”. But this is part of the excitement of the new knowledge experience. You will have many questions, and not all of those will be answered – this is part of life’s mystery.

### Discovering a new world view

A number of years ago, a book with the title *The World is Flat* was published. The author (Thomas Friedman), makes the point that modern technology (and especially information technology) has made the world “smaller” by making the boundaries between countries and continents more flexible. Accountants in

India do tax return forms for Americans – because they can do it cheaper than the Americans while the latter are sleeping!

During your years at university, you may have the same experience. Not only will you encounter a substantial number of international students from various continents, but you will also realise that knowledge and information are truly global and have no boundaries. Through the internet you can download information and articles from all across the world – in your room or in the library! Your world is much smaller and more accessible than that of your parents.

At the same time, you will discover where you (and your community) fit into the “bigger scheme of things”. You will discover that you are part of a specific university, a city/town, a country and a continent. It is indeed a new view of the world – the universitas!

### Discovering a new financial world

Notwithstanding who pays for your tuition and accommodation (your parents, a bursary, a loan), university life brings with it a **new financial discovery**. Financially, you will be on your own – even though you may be able to fall back on your parents if things go terribly wrong. It is you who will have to take financial decisions and who will have to take responsibility for those decisions. An example: few students have the money to buy all the handbooks that are used in your studies. You have to make a choice: either you buy (some of) your books second hand, or you share with others or you use the library. The same choice may apply to a cell phone, food and recreation.

If you waste your money on unimportant things, you will pay a price. It may even lead to your being forced to drop out of university. Studies have shown that lack of funding is one of the single most frequent reasons for students dropping out of university. Many students do part-time work and this is an important part of financial independence. But part-time work is not always available. It is therefore very important to manage your money well and in a constructive way, so that you can continue and complete your studies.

One aspect of student life that has important financial implications is your academic progress. Some universities have incentive schemes for students who perform academically. These students then receive “discount” (up to 70%) on their tuition fees for the next year. Unfortunately, the opposite is also true. Students who fail modules and must repeat them cost their parents or themselves more money. And such students also cost the university money, because the university receives less funding from the state for repeaters.

Therefore: begin with the basics by ensuring that you make good academic progress. In this way, the rands and cents will look after themselves. And remember, one of the most important reasons for going to university and getting an education and a degree is that you will be better remunerated when you go into the world of work. Studies worldwide have shown that graduates' remuneration is much higher than those who do not go to university.

### **Discovering more about religion and the diversity of belief**

With the greater diversity awaiting you at university, there will also be a greater diversity of religions and belief systems. You have, by this time in your life, developed your own religious or other belief system. Your religious customs and traditions are known to you and you know what to expect. Most religions and churches are very active on our university campuses, and they are afforded enough space and opportunity to serve their members.

You will, however, discover that a community of faith on a university campus is "different" from that of your home. For instance, for many Christian young people there is a different "feel" to the university religious experience, and this demands an open mind. Many churches have camps for first year students to help them to adapt to this new experience and university life in general.

In addition, you will come into contact with fellow students who belong to a different church or faith. The principles mentioned with regard to diversity are also applicable here. Respect and tolerance are non-negotiable. Contact with students who have different belief systems need not make you worried or anxious, as it is part of the diversity that is South Africa. But it will demand that you will, on an ongoing basis, give account of what you believe. If handled correctly, this will strengthen your faith and spirituality and may even make you discover a new side of yourself.

### **DISCOVERING THAT MORE FREEDOM BRINGS MORE RESPONSIBILITY**

All this emphasises that you are on the verge of a very exciting time of your life. But in all the examples mentioned above, you will have to make a choice. It is a time of choices, but then the right choices.

*You will have more freedom.* For example, you will be able decide for yourself whether you want to get up and attend lectures, or whether you will use money

that is meant for your studies on other things. It may seem that boundaries have suddenly fallen away.

*Truth is that the greater freedom will also bring greater responsibility.* You will have to take responsibility for your choices, including the wrong ones you will make (almost inevitably). And this is part of the university discovery: to make mistakes and learn from them – and in the process to make better choices and fewer mistakes. And this is the best way to learn and prepare for your life after university.

The kind of choices you will have to make include all the aspects mentioned above and more. Your university journey of discovery will force you to make these choices and to learn from them. And even though you may have views on a score of issues already, some of these will change during your study years. And this is because you will start thinking (even more) for yourself, and discovering more about yourself and the world.

In deciding to go to university, you will make a life choice. It will have many kinds of consequences, all of them having to do with preparing you better for the "university of life".

# WHY GOING TO UNIVERSITY IS NOT ALWAYS EASY

## 7 questions to Jonathan Jansen

### 1. How did you find the transition between school and university?

I found it exceptionally difficult to make the transition between school and university. I failed my first year at university and had to repeat *Chemistry 1* three times before I passed it. Okay, I was the product of a poor high school education – every day I had to drive three hours to and from school and the previous political crises prevented several members of my generation from coming to class. Sometimes I wish that I had someone to inform me of the basic things that were necessary in order to pass and survive my crucial first year at university. It would have saved me a lot of time, stress and money.

### 2. Why did you find the transition to university difficult?

The first thing that they should have told me is that at school you only have to start studying a few days before the exams, but at university you have to study every day. The reason is simple: The sheer volume of work at university makes it impossible to wait until just a few days before the exams to get serious. Waiting is a recipe for disaster.

They should also have told me that simple memory work will result in failure. Universities don't place a high premium on what you can remember and repeat. A good lecturer wants to find out how much more you know than just what had been shared during the lecture; what else you read, above the prescribed texts; if you can expand the ideas that you learnt about in class to other contexts; if you can think for yourself.

It is also extremely important to form your own study groups. Obviously lecturers aren't as available as teachers. Group work enables you to learn from your fellow students, to make a contribution to others' learning and to find support during tough times – something that you're bound to experience.

### 3. And the difference in the classroom?

Classes are much, much bigger than at school, which means that opportunity for personal interaction with the lecturer is scarce and irregular at best. Although this doesn't mean that you can't consult the lecturers during scheduled office hours, it does mean that you mostly have to work independently; and to a much larger extent than was the case at school.

### 4. What do you mean by working independently?

A good example is the fact that university studies revolve around the reading of books and journals. In some countries people rightly talk about "reading for a degree". On the one hand this means that you have the texts that are prescribed for class, but on the other hand it also means that you have to read more than is expected of you in order to contribute to an assignment or class discussion and have a broader frame of reference. Naturally you will at first find it difficult to master academic language, but students who read consistently will find that it soon becomes second nature to read texts in their discipline as they become more familiar with the key concepts and methods. This of course means that the university library is an essential resource during your studies.

### 5. And what about writing?

Something else that someone should have told me is that at university you will firstly be judged on your writing ability. Unlike at school, lecturers will first take notice of you on the grounds of your excellent writing. The ability to write well is an important skill for successful university students. It requires you to practise your writing skills: to sum up important texts, identify key arguments,

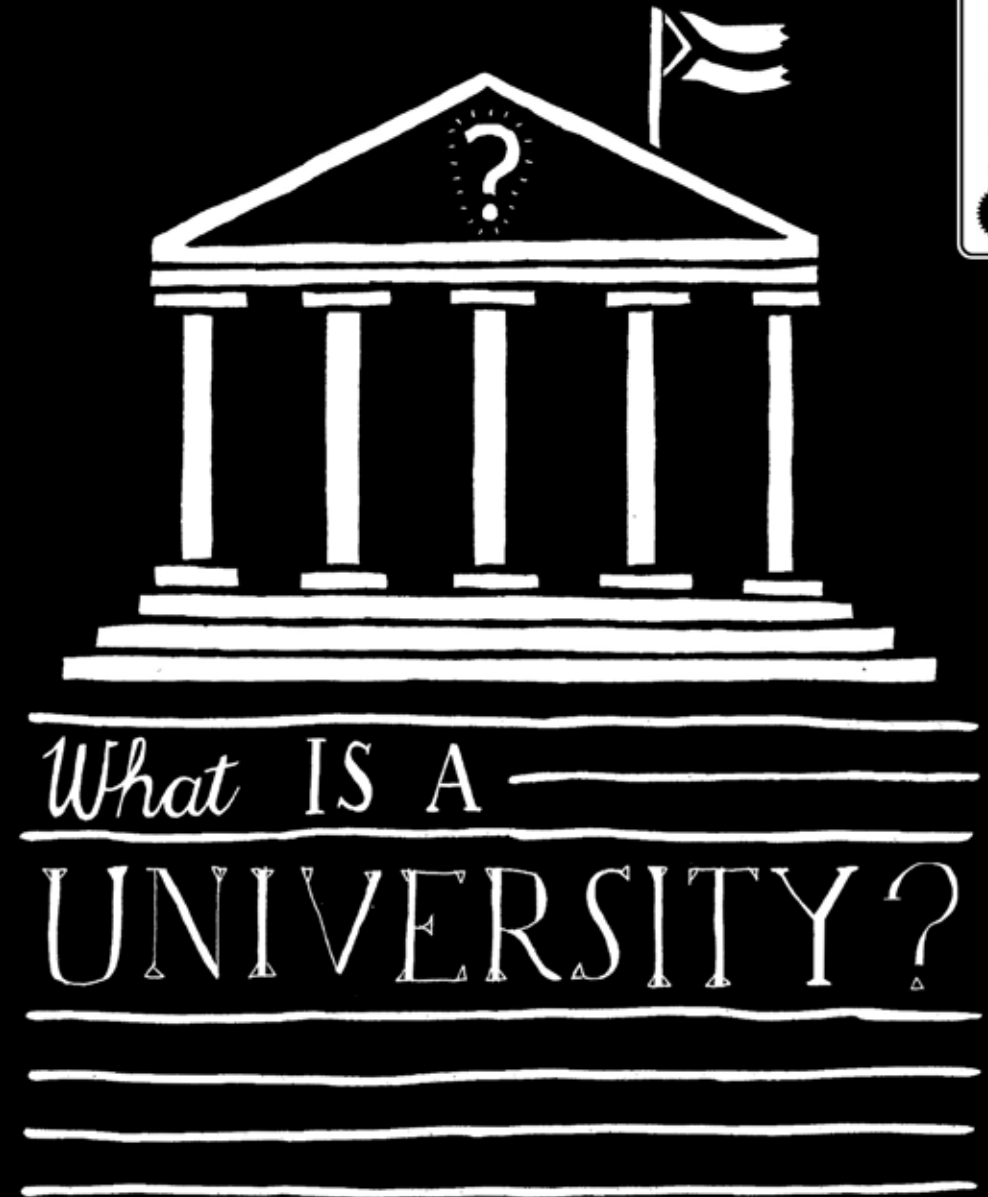
compare clashing viewpoints, as well as report these aspects in writing in a clear and meaningful way. Just like playing a musical instrument, there is only one way to master this art, and that is by continuously writing.

### **6. How does one find time for everything?**

At university you suddenly find yourself with loads of free time and the inability to manage this newfound freedom has caused many a first year student to go under. Schools are regulated – according to me they are sometimes too regulated. Schedules are packed, homework is required, and the school day is filled with class tests and other assignments. At university students sometimes only have one or two lectures a day; or sometimes even no classes. It is a fatal mistake to think of it as “free time”: At university level it means you have to study, read, make use of the library or connect with lecturers.

### **7. So is university just about studying?**

The most important thing that I was told about my first year at university was that it was going to be the most exciting time of my life. Coming to university doesn't mean that you will only be studying: it means new friends, it brings new challenges, it implies new freedom and it means new opportunities. During your first year, students forge lifelong friendships and some people even meet their future spouses during their university years. It is important to take part in the rich variety of social events (rag, clubs, residences, outings) which help to form the total university experience. Because these activities aren't just one dimensional they bring balance to student life and provide an important opportunity within the academic environment for getting rid of stress.



***Imagine the following situation: An overseas colleague visits my university. We discuss all kinds of interesting things, I invite her to lunch and afterwards she asks me to “please show her the university”. What do I do if someone asks me a question like that?***

One answer could be: Put her in your car and drive past the university buildings. But has my visitor seen “the university” if she has just seen a series of buildings from the outside, or even the inside? There surely is more to a university than simply buildings. Maybe, we could wonder, the university isn’t essentially the buildings, but all the *knowledge* found in the space known as the university? If so, can that be *shown* to anybody? How do you perceive knowledge? One possible answer could be that the knowledge which exists at the university is collected in the library and all the texts which lecturers, researchers and students have produced. Nowadays knowledge doesn’t only have to exist in printed form, but can also be stored electronically. Is the university the total collection of knowledge in printed and electronic media in all the buildings of the university and on the computers in the lecturers’ researchers’ and students’ studies? Most of us, I am sure, will feel a bit uncomfortable with such an answer.

A more promising line of argument is to claim that a university is not only or essentially buildings or knowledge. It is, essentially, a collection of *people*, united into a group by something or other. Which people? Only the teaching and administrative staff? If so, the university is, compared to all the people we normally see on campus, a very small group of persons. Or is the university also, and maybe even essentially, its students – the large majority of people we encounter on any campus?

## **A UNIVERSITY CONSISTS OF STUDENTS**

The idea that a university actually and essentially consists of *students* is, to my mind, the most reliable – in fact, the correct - view.. The reason for this is not the fact that the students form the majority of people associated with the university. The reason much rather has to do with *what students are* and *what they do or, at least, are supposed to do when they act as proper university students*. If you understand the latter, you will understand better why “university” and “being a student” essentially mean the same thing.

In the history of the university where I work, Stellenbosch, the idea that the university is in essence the students was strongly propagated for the first time by a well-known professor, SJ Shand. In 1916 when a law passed in the

then Union Parliament which changed the name of the Victoria College to the “University of Stellenbosch”, Shand delivered a lecture entitled: “The making of a university”.<sup>1</sup> In this famous lecture Shand made the following statement: “The real university is neither a collection of books, nor a collection of buildings, nor a collection of lecturers; it is a collection of students who possess the will to knowledge – the will to possess it and still more the will to advance it. A university is constituted by its students and by them alone”.<sup>2</sup> With this Prof. Shand didn’t mean that lecturers aren’t part of the university. According to him, what turns a university into a university is a “frame of mind” which refers to the “the will to knowledge”.

Being a student has nothing to do with how old a person is or how many degrees you have. Being a student is also not synonymous with messing up, drinking a lot, searching for a husband or wife, doing sport, bunking class or participating in serenades. According to Shand being a student is a frame of mind: the mindset with which we search to understand our world better. *All persons who try to understand our world better are therefore students.* Students are people who differ from each other in several aspects, but who are united (thus a *universitas*, a unit society) by the search for more and better *knowledge*.

But this raises another question: what is “knowledge”? There are several types of knowledge. Getting to know a girl is acquiring a certain type of knowledge. Learning a language entails the acquisition of a certain type of knowledge. Believing the earth is round, merely on the grounds of the fact that most people believe it, is a type of knowledge. Hearing voices in the forest like the French Middle Age heroine Jeanne d’Arc, believing them and, going against every accepted social convention of the time, inspiring and leading the French to big military victories against formidable enemies, is a type of knowledge.

Are all these types of knowledge the point of issue in the frame of mind which we call a university student’s search for knowledge? Not exactly. The mindset of a student is an aspiration towards a certain type of knowledge. We call that knowledge “scientific knowledge”. *A university is an institution where students search for scientific knowledge.* Practising science means acquiring a certain type of knowledge, but also sharing it. The acquisition of knowledge is called research. The sharing of knowledge is called teaching. Students at a university are busy with the research and teaching of scientific knowledge.

1 Although the act was accepted by parliament in 1916, it only came into operation on 2 April 1918. Since that date the existence of the “University of Stellenbosch” became official.

2 Shand, S.J. 1995. *The making of a university*. Stellenbosch: Stellenbosch University. p. 3.

## AT A UNIVERSITY WE PRACTICE SCIENCE

What then is “scientific” knowledge? A definition by HW Rossouw simplifies the matter. He alleges namely that science is the result of the “endeavour of the human intellect to attain in a disciplined way a whole of coherent, rationally justifiable, and universally valid insights with regard to the reality in its different facets”.<sup>3</sup> One should look at each of these qualifications in a little more detail.

### Scientific knowledge has a specific method

*The strictness of its method distinguishes science from other types of knowledge.* There are many philosophers of science, of which Karl Popper is the best-known, who allege that science is characterised by its method. Different subject fields have specific methods which are adapted to the type of questions that are asked and the type of phenomena which are examined. Microscopic observations for example have no place in sociology (the study of human behaviour within the social context), while questionnaires for opinion polls, which are often used in sociology have no place in microbiology, where the smallest living organisms are studied. Something like experimenting plays an important role in most of the scientific methods, especially in the natural and applied sciences.

Methods are of great importance in science because it can be used and applied by anybody who has the necessary background knowledge. The thing that distinguishes science from many other types of knowledge acquisition is the fact the scientific knowledge claims and methods can be confirmed and applied by a range of research workers. In short, scientific knowledge is never “private” or privileged. It is public and can be tested and controlled. *Two factors determine whether or not knowledge is scientific.* The first is that the knowledge should be based on observations accessible to all, and the second is that it should be based on logical argumentation.

### Scientific knowledge is rational

Rossouw further states that scientific knowledge is *rationally justifiable* knowledge. That simply means that for all knowledge claims that pass as science, a person should be able to give good reasons. In scientific practice a person doesn’t suck knowledge claims out of their thumb, and you don’t just defend theories because you have a feeling that they are the best or your

3 Rossouw, HW. 1993. *Universiteit, wetenskap en kultuur*. Cape Town: Tafelberg. p. 95.

common sense tells you that you must accept something. Some of the most famous breakthroughs in the history of sciences, like Einstein's development of his relativity theory, has sprung from a genius' questioning and rejection of several views that we see as "obvious", for example that space cannot be "curved". In the practice of science your gut feeling is not important; what is important are those claims that you can give good *reasons* for, even if those claims conflict with established knowledge and wisdom.

### **Scientific knowledge is systematic**

Scientific knowledge is also systematic. This means that scientific knowledge connects different ideas with one another in such a way that they make sense to us. We can illustrate this by means of a simple example: The claims "iron expands when heated up" and "lead shrinks when cooled" are both surely true, but on their own they're not yet "science" in the true sense of the word. It makes more sense when you place that which these two statements claim in relation to a wider theory that claims "*metals* expand when heated up and shrink when cooled", and that then be brought in relation to a theoretical law that explains the behaviour of certain elements in nature on a molecular and even atomic level. To quote Rossouw on this: "That's why scientific practice, in capability as well as in result, still tries to make connections and integrate knowledge items through comparison, classification, subsumation and generalisation"<sup>4</sup>.

*What then is a university? A university, I would answer, is a societal institution where students (in a way that admits that every lecturer and researcher is actually also a student) obtain and share scientific knowledge as has just been described. It is the frame of mind that truly gives the phenomenon of the university its content.*

Of course other things also happen at universities. People practise sport at a university. Friendship and collegial relationships that play a big role in people's lives, also outside of the professional context, are forged. An alarming number of meetings are held. Community service is done on a wide front, often also by students. Parties are held, money is collected, series of activities are organised by societies, politics is practised, late-night conversations about serious issues as well as total banalities are held around tea-urns and in bars – and I could go on. But all the last mentioned activities are secondary to the main business of the university, namely practising science by devoted students. Where science

<sup>4</sup> *Ibid.*, p. 96.

is practised in a context where experienced students (lecturers if you want) lead less experienced students into the wonderful world of science, in order to equip them to become science practitioners themselves and give recognition (in the form of degrees and diplomas) for the progress made with the process – there we see the heart of the university.

## **THE UNIVERSITY IS A SOCIETAL INSTITUTION**

In the paragraph above I called the university a societal institution. But what is an institution? We could say that institutions are the ways in which people in a society act, not just as individuals but also as groups. These collective actions are usually inspired by some or other common goal. The state (government) is an example of such an institution: The government is the collective action of people to create order in our coexistence and to subject that coexistence to acts and the moral demand of justice. Marriage is also a societal institution, a form of collective action. Marriage (in all societies) is a wide-accepted way in which intergender relationships are organised and the practise of sexuality is directed and cultivated, and normally serves as the social space wherein children are begotten and brought up. The aims promoted by institutions are often deep-seated ideas that have obtained a very high level of acceptance and authority in a society. Take the idea that, when people's rights become infringed, the way to settle the problem is by due process of law. This is universally accepted in all democratic societies. An independent judiciary exists and embodies a the social institution that gives expression to the force and authority of this deep-seated idea or conviction.

The university is also such a societal institution. That means that the university is a kind of social or collective action by means of which people embody and promote a certain idea. This is the idea that scientific knowledge is the best type of obtainable knowledge and that young people are best prepared for life when they get familiar with the scientific knowledge that the university offer us.

The latter, as I said, is an *idea*. Like all ideas, you can ask critical questions about it: Is it really a valid idea? What we, however, cannot deny is that this idea is so widely accepted in nearly all current societies that it has developed into more than just an idea. It has developed into the present-day institution of the university. The university, to state it differently, is therefore nothing more than an *institutionalised idea*. Let's investigate how this idea has developed throughout the centuries.

## HOW THE UNIVERSITY DEVELOPED

In the antique civilisations like that of the Greeks and early Islam groupings (like the one in Timbuktu) we find schools where adults acquired all types of knowledge. In ancient Athens the philosopher Plato for example had a school with the Greek name *akademeia* – the word from which our “academy” is derived. But it is rare to find any references to these schools where they are called “universities”. The idea of the university is to a great extent a product of the Middle Ages, particularly the twelfth and thirteenth centuries. During that time Bologna in Italy, Paris in France, and Oxford and Cambridge in England came into being as the first institutions known as universities. These first universities were products of the medieval church, organised by the monastic orders. Central to this practice was a teacher who gathered a group of students around him<sup>5</sup> to whom he read aloud his written doctrines word for word during (literal) “lectures”. These doctrines were mostly interpretations of or commentaries on religious dogma. Initially the aim was not to stimulate critical discussions; it was rather to initiate the students into the master’s way of thinking, and so to enter his “school”.

The university as we know it today is however an institution that differs significantly from its medieval predecessors. The modern university is rather a product of the *Enlightenment* than of the Middle Ages. “Enlightenment” refers to the period in Europe during the late seventeenth and eighteenth centuries. With the Enlightenment the idea came to being “that knowledge [acquired at a university] is more likely to be advanced through free inquiry than through collective endorsement or rejection. More specifically, hypotheses can only be validated as knowledge – as opposed to dogma or official party policy – by being subjected to the tests of free inquiry”.<sup>6</sup> The latter idea usually represents a totally different world from that of the medieval university where the process of acquiring, systematising and transferring knowledge is totally in the service of the understanding and defending of the authoritative church dogma.

*One of the important shifts that the idea of the university has undergone since the start of the Enlightenment is the insight that scientific practice pertaining to the university takes place internationally, and that the game rules for scientific*

5 Unfortunately at that time women didn’t take part in these events.

6 Moulder, J. 1977. University neutrality: some puzzling reflections in a South African mirror, in HW van der Merwe & D Welsh (eds.). *The future of the university in South Africa*. Cape Town: David Philip. p. 251.

*practice are therefore determined internationally.*<sup>7</sup> A present-day university that thinks that they can just do their own thing within a certain, local environment, is no longer taken seriously. The game rules of universities require that all work done at universities must be able to be checked and scrutinised by peers, in other words colleagues on the same level of expertise connected to universities elsewhere in the world. This holds all kinds of implications for universities, especially with regard to the languages used for teaching and research. If the university’s primary medium of education is not a language accessible to peers, proper peer review of that university’s work cannot be done and that leads to a questioning of the quality of the university’s work. That is one of the reasons why we increasingly find that English is becoming the international language of university scientific practice.<sup>8</sup>

## THE UNIVERSITY AND THE COMMUNITY

Today there are numerous voices that allege that a university, besides the two core functions of research and teaching, also has a third core function, namely community service, or, as it is increasingly called “community interaction”. This notion acknowledges the fact that a university doesn’t exist in an intellectual, social or political vacuum. A university grows from within a community and should also serve this community.

This point of view became increasingly popular during the past century when it started becoming clearer that universities are of decisive importance with regard to economic growth. While universities in previous centuries were mostly left alone to their own devices, with sporadic recognition of the fact that they sometimes produce people that can play special roles in society (Oxford and Cambridge, for example, have produced a number of British politicians, especially prime ministers), the current opinion that universities

7 You can probably argue that universities in the Middle Ages also operated “internationally” in the sense that they were located far from one another and often received lecturers from other places. The term “internationalising” however presupposes the phenomenon of different nations, and the latter weren’t found in the Middle Ages; nations are products of the modern world. The language of written communication in the Middle Ages was mostly Latin – a predecessor of what nowadays we see more and more in the university world, namely that effective international scientific practice gives more and more rise to the need for and use of a so-called science language or *lingua franca*.

8 It is not my intention to claim that, since the start of the Enlightenment, English has suddenly everywhere become the international academic language. The latter phenomenon has actually only really started occurring since the eighties of the twentieth century. At the start of the Enlightenment in the eighteenth century the tendency was rather to only use local languages because these languages were so closely connected to the nations that have only originated at the end of the Enlightenment. The need for, and growing domination of English is especially a symptom of “globalisation” which is still taking place across the whole world.

are extremely important and decisive resources in modern societies has grown. The modern world (that is the historical period that started at the beginning of the seventeenth century) has been dominated by a growing realisation that knowledge is power, and that scientific knowledge is not only important to satisfy people's curiosity, but that the science and techniques that flow from it are capable of getting the world under our control in an incomparable way.

Several examples can be given. Isaac Newton's (the famous seventeenth century mathematician and physicist from Trinity College, Cambridge) formulation of the laws of mechanics (for example the law of gravity) was so accurate that space travel in the twentieth century became possible thanks to the application of a number of his insights. Albert Einstein's (who only in his later life became a university professor) general and special theories of relativity gave us a whole new understanding of the universe, but also brought insight into the massive energy locked up in the nucleus of an atom, with all the repercussions it has had since then. Watson and Crick's decoding of the double helix structure of the DNA molecule – the basic building block of all forms of human life – caused a revolution in biology during the second half of the previous century and has recently led to the description of the entire human genome and to technologies (for example cloning and stem cell transplants) that place formerly inconceivable powers in the hands of medicine – possibilities like the curing of diabetes and the repair of damaged nerve tissue of paraplegics and quadriplegics.

The growing realisation is that universities are necessary national assets that can make decisive contributions to an economy, which is increasingly driven by access to new knowledge and technology (the so-called knowledge economy). It all causes the relationship between university and community in our time to become a more and more complex matter. The government and others that fund the university want to see fast results; they insist that the university must do "applied" research – that is research where the applications are clear and preferably multiple. Many academics, however, are still convinced that the growth of science itself can be kept in check by the demands for applications. They prefer to practise science purely in response to the stimuli of the discovering mind of the researcher; they prefer to investigate problems that are gripping because of the intellectual insights that it will yield, and not necessarily because it is always clear what the "applications" of such knowledge will be. The relationship between university and community is therefore increasingly characterised by a tension between the autonomy of science itself and the demand for relevance or applicability from the community. This tension will not disappear, which is probably a good thing, because it forces the university

as well as society to try and find a balance between the different forces that influence the work that the university does.

### **The university has a responsibility towards the community**

How then must we understand the relationship between university and community? I would like to allege that the university does have a clear responsibility toward its community. In the first place it is a responsibility of *service* without implying *servitude*. There is nothing wrong with the fact that a university plays into the needs of its surrounding environment in its research and teaching programmes, as long as its freedom to come to conclusions that exclusively rest on scientifically considered and evaluated evidence does not come under fire. The university owes no-one excuses for the fact that the truth, which is its only norm for investigation, sometimes hurts.

The university's second responsibility toward society is *investigation* without implying *prescriptiveness*. Its academic freedom and autonomy not only enables the university, but also gives it the responsibility to work searchingly and experimentally with regard to unsolved problems in society. If – to use an image from the early days of pioneer settlement in South Africa – society is seen as the ox wagon<sup>9</sup> that moves slowly and cannot easily be turned, then the university can be seen as the leader of the oxen. The leader of the oxen is not the boss who cracks the whip, sits on the wagon-box and decides where they're going. But the leader of the oxen has to decide whether the route is passable; he must be on the lookout for thorns and dongas, and must sometimes contrive routes to the boss' destination. The leader of the oxen explores, because he sees the road before his boss and the oxen see it. That is what the relationship is like between university and society: The university does not decide what society's destination will be; the university doesn't rule the country. But the university must explore whether the old way is passable for society and if they will be able to reach the destination without injuring the oxen or getting stuck in the mud.

The third and last of the university's community responsibilities, is *value mediation* without *indoctrination*. Probably the most important service that a university can provide to a society is when it can extend its academic values to the cultural life of the community that it associates with. The university is very aware of how preliminary and tentative, *pending further evidence*, its research results often are. To present them as the final truth will come down to indoctrination, the forcing of "facts" and "information" that couldn't stand

<sup>9</sup> With acknowledgement to Marlene van Niekerk from whom, I think, I first heard this image several decades ago.

the test of critical purification. The university serves the community much better if it rather sees its task of teaching as an opportunity to contribute to the establishment of what I, for lack of a better word, call a scientific mentality in the tackling and handling of problematic issues.

In the same way that science must acknowledge several “non-academic” influences on its practice, society can also benefit a lot from an academic-scientific way of doing. The university has the task of putting its research, teaching and community service programmes into action to provide to the community, not so much people who have encyclopaedic facts and techniques at their disposal, but people who *internalise* the values that form the basis of scientific practice and thought in such a way that they can approach society’s problems.

To study at a university is therefore one of the biggest privileges one can have. It provides the key to a proper, well-rounded education, and therefore provides the best opportunity to a decent career, if of course you use your opportunities correctly. A university degree is not an automatic guarantee to a prosperous and successful life; there also are other forms of education and training that provide attractive possibilities, while people with university degrees often fail in life. Nevertheless, people still strive towards a university education because the idea that a university can best train and prepare us for life, as I have alleged above, is still widely accepted.

# WHY WE ALSO NEED INDIGENOUS KNOWLEDGE

## 7 questions to Mogege Mosimege

### 1. What is indigenous knowledge?

Indigenous knowledge systems (IKS) is generally taken to refer to a set of knowledge, skills and technologies existing and developed around specific conditions of populations and communities indigenous to a particular geographic area. It constitutes the knowledge that people in a given community develop over time and continue to develop and adapt to their changing conditions. It is therefore not static, but it is based upon existing forms of knowledge and know-how that are part of a community. It is the basis for decisions and development in agriculture, food preparation, health care, education and training, environmental conservation, and many other activities.

Some of the earlier definitions that have been used for IKS are those of Michael Warren. In 1991, he defined “indigenous knowledge as local knowledge – knowledge that is unique to a given culture or society. Indigenous knowledge (IK) contrasts with the international knowledge system generated by universities, research institutions and private firms”. In 1992, he further defined indigenous knowledge as synonymous with “traditional” and “local” knowledge to differentiate the knowledge developed by a community from the international knowledge systems sometimes called “Western” systems, generated through universities, government research centres and private industries. IK refers to the knowledge of indigenous peoples as well as any other defined community.

Given its inclusive and cross-cutting nature, IKS has also been defined as “an all inclusive knowledge that covers technologies and practices that have been and are still used by indigenous and local people for existence, survival and adaptation in a variety of environments. Such knowledge is not static but evolves and changes as it develops, influences and is influenced by both internal and external circumstances and interaction with other knowledge systems. Such knowledge covers contents and contexts such as agriculture, architecture, engineering, mathematics, governance and other social systems and activities, medicinal and indigenous plant varieties, etc”.<sup>10</sup>

## **2. Why do we need to develop indigenous knowledge?**

Indigenous knowledge offers a bridge between what is studied in a variety of disciplines and study programmes and what happens in communities from where such students come or have been raised or the institution is part of. It therefore enables the students to explore what they encounter in communities and its relation to their own study programmes, making their studies relevant to conditions around them. This provides an opportunity to study and conduct research that informs the students about community activities and projects and how what is studied at universities can be made more relevant to such communities. If this is done correctly, it provides a platform for proper interaction between what is studied in universities and the prevailing conditions in the communities.

For students who have not been part of such communities (indigenous and local communities), IKS provides them with an opportunity to learn about other communities and their knowledge, providing a broader understanding of a variety of communities that make up the South African society.

Indigenous knowledge is also interdisciplinary, it is applicable and relevant across disciplines of study and across faculties in which the various disciplines are offered. It makes it possible for students from different study areas to interact and in some cases work together in joint research projects that involve a variety of focus areas. It encourages collaborative projects. This can, to a greater extent, be useful in showing that disciplines do not exist in isolation but are interrelated.

Indigenous knowledge also relates to and shows how knowledge in South Africa relates to knowledge from other countries. Countries like Brazil, China

and India have evidence of extensive work in indigenous knowledge, especially how such knowledge can be made part of the mainstream knowledge. Such examples, when compared to developments in indigenous knowledge in South Africa, provide an opportunity to show how indigenous knowledge can be incorporated into the curriculum, at school and tertiary level.

## **3. How has indigenous knowledge contributed to science?**

There are a number of examples in which IKS has been used as a basis for understanding a variety of concepts in science and technology. Some of the examples are the counting systems in various African cultures and how a variety of mathematical concepts have been explored and included in curricula all over the world; the beautiful mural decorations and relation to the whole mathematical study on geometry; the various beliefs in African communities and how such beliefs have served as a basis for scientific exploration.

For many years the San Community in the Kalahari have eaten the hoodia cactus to stave off hunger and thirst on long hunting trips. This indigenous knowledge has subsequently been used by the Council for Scientific and Industrial Research (CSIR) and other researchers at other Science Councils and Universities to investigate various properties of the hoodia plant and finally show the following: the hoodia sap can be used to treat eye infections; the brew of boiled hoodia pieces can be used to treat severe stomach pains; extracts from the hoodia plant have shown in clinical trials on obese subjects that they can reduce caloric intake by 30-40%, and significant weight loss has resulted from such a drop in caloric intake. Clearly the indigenous knowledge based on the hoodia has provided a variety of opportunities for research to explore scientifically how such knowledge may change people's lives for the better. The exploration on the hoodia has shown clearly how developments in research in science got its base on indigenous knowledge.

The Department of Science and Technology is currently funding the Timbuktu Science Project which is carried out under the leadership of the Astronomy Unit at the University of Cape Town. This project, done in collaboration between South Africa and Mali, explores whether there is any cultural astronomy in the Timbuktu manuscripts. This project has thus far shown the extent to which African astronomers of the past integrated knowledge of astronomy into various African ways of life. Even though this project is not yet completed, it shows clearly that there is a major basis on developments and current studies in astronomy and how these relate to the cultural astronomy dominant in various African countries.

<sup>10</sup> Onwu, G. and Mosimege, M. (2004). Indigenous Knowledge Systems and Science and Technology Education: A Dialogue. *African Journal of Research in Mathematics, Science and Technology Education*, 8 (1), 1-12.

#### **4. How is indigenous knowledge promoted in South Africa?**

In 1996 the CSIR was commissioned by the Portfolio Committee on Arts, Culture, Science and Technology of the Parliament of South Africa to carry out an audit of indigenous technologies in South Africa. The audits resulted in provincial workshops on IKS and the first national workshop on IKS in September 1998. The results of the audit showed that it was necessary to expand from technologies into knowledge systems as the former was too narrow to adequately describe all the processes and products that the indigenous technologists were involved with.

South Africa has subsequently moved from these early developments to establish a Unit in the Department of Science and Technology focused on IKS. The Unit developed the IKS Policy launched in March 2005 and subsequently embarked upon the implementation of the policy by establishing the National Office on Indigenous Knowledge Systems at the Department of Science and Technology.

Additionally, various national departments that play specific roles in the context of IKS have incorporated such activities into their work. Examples of such departments are: Department of Health; Department of Trade and Industry; National Department of Agriculture; Department of Arts and Culture; etc. Science Councils and universities have equally taken up the challenge to conduct research in IKS and interact very closely with indigenous knowledge holders. The National Research Foundation (NRF) has been providing funding for research in IKS since 2000. The Medical Research Council (MRC) has established a research unit in IKS with specific emphasis on research in medicinal plants. In this respect it is working very closely with traditional healers. The Council for Scientific and Industrial Research (CSIR) has worked for many years on bio-prospecting and has recently strengthened research in this area by working extensively with indigenous knowledge holders in the Kalahari, and various provinces of South Africa. The Agricultural Research Council (ARC) has established a programme on IKS and has undertaken research projects in activities like indigenous farming, medicinal plants and African vegetables. The Mafikeng Campus of North West University has an accredited undergraduate and postgraduate programme in IKS, the University of the Western Cape has established The International Centre for Indigenous Phytotherapy Studies (TICIPS), the University of the Pretoria established CINDEK, and the University of the Free State has established African Studies

programmes in which IKS is prominently focused upon. These are just some of the examples from science councils and universities.

#### **5. How can indigenous knowledge be protected?**

It is well known that indigenous knowledge is largely unprotected. This then results, as has happened over many years, in the exploitation of this knowledge by various multinational companies, without any benefits accruing to the custodians of the knowledge. A leading scholar in the field of Pharmacognosy of African Medicinal Plants, Abayomi Sofowora notes that “African countries should look critically into the modalities of patenting their leading national biological diversity products and knowledge in order to protect the indigenous scientists, farmers, communities and herbalists from exploitation by people from outside the region”.<sup>11</sup> Sofowora is referring to the questions that continue to be a major challenge in South Africa, despite all the efforts and good intentions of the current policies and legislation.

As far as I am aware, the debates at the World Intellectual Property Organisation (WIPO) on an internationally binding instrument on traditional knowledge have not yet reached a stage where they suggest a solution or agreement. An internationally binding instrument with respect to IKS would start the process of challenging exploitation of indigenous knowledge without proper consideration of the knowledge holders and curb the wanton destruction thereof and related natural resources. The lack of international consensus on the substance of an internationally acceptable regime of protection is to be expected as “the countries endowed with genetic resources, traditional knowledge and folklore seek to secure protection for such resources, while the user countries are bound to be reluctant to submit to additional restraints on innovating and creating in ways that conform to existing intellectual property agreements”.<sup>12</sup>

The IKS Policy and the various developments in government departments, especially the Patents Amendment Act of 2005 which has been developed by the Department of Trade and Industry, have provided an opportunity for the protection of IKS in South Africa. However, it is clear that these measures are still largely inadequate to protect IKS. It requires a greater effort from all concerned to ensure that knowledge holders are recognised and their knowledge protected.

11 Sofowora, A. (1999). Medicinal Plants Research in Africa: Prospects and Problems. In L. Makhubu, R. Mshana, O. Amusan, K. Adenji, D. Otieno and J. Msonthi (Eds.). *Proceedings of the Symposium on African Medicinal and Indigenous Food Plants & The Role of Traditional Medicine in Health Care*. University of Swaziland.

12 Weeraworawit, W. (2003). International Legal Protection for Genetic Resources, Traditional Knowledge and Folklore: Challenges for the Intellectual Property System. In C. Bellmann, G. Dufield and R. Melendez-Ortiz (Eds.) *Trading in Knowledge: Development Perspectives on TRIPS, Trade and Sustainability*. London: Earthscan Publications Ltd.

## **6. Is South African indigenous knowledge also relevant for other countries?**

South African IKS is not restricted to South Africa. For instance, issues related to the hoodia plant are not just confined to the San community in South Africa because such communities are also found in neighbouring countries like Botswana, Namibia and Angola. The exploitation and use of the knowledge emanating from the hoodia plant has been part of major international debates. The major debate has been around the use of indigenous knowledge associated with the plant and how such knowledge has been used to generate many products that are now available internationally. Other important discussions have been on how communities who have used such knowledge over many years have benefited from such developments. In South Africa, agreements have been reached between research institutions like the CSIR and the San Community on benefits that will be shared with such communities emanating from the use of their knowledge in research in these areas. Discussion in these instances can therefore not be confined to South Africa only but also to neighbouring countries where such knowledge has also been acknowledged and recognised.

Countries such as China and India have used indigenous knowledge over many years and have clear examples of how such knowledge can be made part of the mainstream and incorporated in the curriculum. In fact such countries have also made significant progress on how such knowledge can be protected. For example, India has developed the Traditional Knowledge Digital Library (TKDL) which has been made available to various Patents Offices in various countries to refer to when patents related to indigenous knowledge that has been used in India over many years are applied for. This means that indigenous knowledge is not unique to South Africa. However, our country can make a unique contribution through indigenous knowledge that is specifically found here and that is not necessarily found in other African countries and other parts of the world.

## **7. You completed your PhD on the topic. Why did you get involved in indigenous knowledge systems?**

I have actually completed my PhD in an area of mathematics called ethnomathematics. This is an area that studies mathematics and various mathematical ideas in relation to cultural and social aspects of life. Ethnomathematical studies emphasize and analyse the influence of socio-

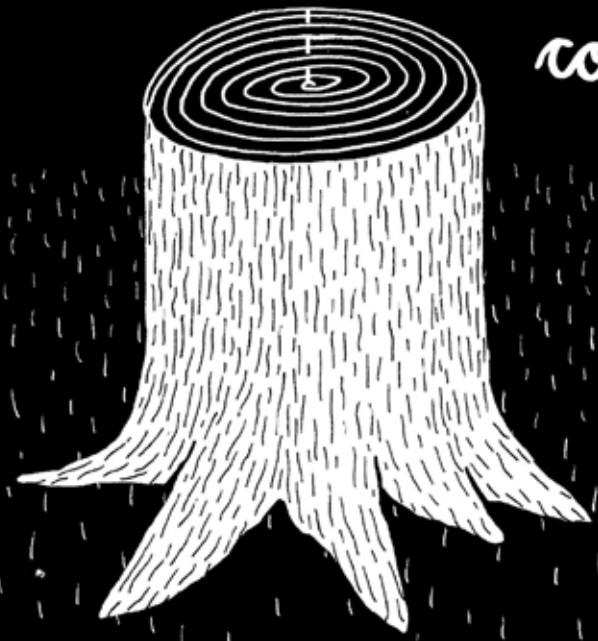
cultural factors on the teaching, learning and development of mathematics. The area explores and reflects upon a socio-critical view and interpretation of mathematics and mathematics education which enables students to reflect on the realities in which they live and how such realities can be interpreted and made sense of from a mathematical point of view.

Ethnomathematics is therefore one of the strands in indigenous knowledge which helps us to understand how communities make use of mathematical concepts, principles and processes in their daily activities. Studies in this area contribute to our understanding of indigenous mathematical knowledge and how such knowledge may be integrated in classroom activities. As shown in the two definitions of ethnomathematics below, it is an important strand in the context of indigenous knowledge systems. [Societies] have, as a result of the interaction of their individuals, developed practices, knowledge and in particular, jargons... and codes, which clearly encompass the way they mathematise, that is the way they count, measure, relate, and classify and the way they infer. This is different from the way all these things are done by other cultural groups. [We are] interested in the relationship... between ethno-mathematics and society, where 'ethnos' comes into the picture as the modern and very global concept of ethno both as race and/or culture, which implies language, codes, symbols, values, attitudes, and so on, and which naturally implies science and mathematics practices (D'Ambrosio, 1984). Gerdes (1994:20) defines ethnomathematics as 'the field of research that tries to study mathematics (or mathematical ideas) in its (their) relationship to the whole of cultural and social life'. Gerdes (1996:915; 1997:343) goes on to indicate that as a research field, ethnomathematics may be defined as the 'cultural anthropology of mathematics and mathematical education.'

The research I have conducted and other research that has been conducted in this area in South Africa and other parts of the world has made me understand and explore some of the following about South African communities:

- History, development and use of mathematical concepts in various indigenous communities;
- Mural decorations that are encountered in various South African communities and the related mathematical concepts, more specifically geometrical concepts that are prominent in such decorations;
- Indigenous games, their history and role in communities and the various mathematical concepts associated with such games;
- The use of mathematics in beadwork in various communities in the country and how such beadwork has become central in showcasing the depth and wealth of knowledge of South Africans.

How did  
South Africa  
universities  
come about?



***The university in South Africa has a long pedigree which incorporates a wide range of influences and developments in many countries and cultures. Let's investigate these different influences.***

The South African university's origins goes back in the first instance to British and Continental universities of the 19<sup>th</sup> century and via them, in turn, to the origins of the Western university in the *studia generalia* (Latin: "schools of general study") of 12<sup>th</sup> century Europe. At a time of intellectual and commercial revival in the region, these grew up in response to a rising demand for more than the devotional training then given in Christian church schools, which was the only form of organised advanced education then available.

At first the structure of these *studia* was very casual, with teachers and students coming and going as they chose. A good teacher would often take students with him (all the teachers were male) if he moved from one *studium generale* to another. However, if a particular *studium generale* gained a reputation for the quality of its teaching, it began to attract students from near and far. By the end of the 12<sup>th</sup> century the best-known of these renowned institutions were those in Bologna, Paris and Oxford, where teaching was offered in subjects like Law, Medicine and Theology and where licences to teach these subjects (known as degrees) were awarded to those who passed an oral examination.

Teachers and students having close ties to one particular *studium generale* often formed a loose corporation there to safeguard their own interests in the town; like other corporations and guilds at this time, this was labelled a *universitas* (Latin: "a collectivity"), but to this was added the description, *magistorum et scholarium* ("of masters and students"). Because of their growing prominence within the *studia generalia*, these *universitates magistorum et scholarium* gradually became synonymous with the former and by the late 14<sup>th</sup> century the abbreviated label *universitas* was beginning to be used by itself to describe such institutions of higher learning. From this comes our term "university".

Another marker of their growing status at this time was their formal recognition as semi-autonomous bodies by the state and the church, both of which were willing to grant them formal charters so as to put them on a solid legal footing. This meant that they were free to govern themselves, provided they taught neither atheism nor heresy. However, this semi-independence came at a price: they had to finance themselves, which they did mainly from students' fees. This growing formalisation of their structure and the increasing appreciation of the value that the training they provided could offer to society prompted the foundation of more such institutions during the 14<sup>th</sup> and 15<sup>th</sup> centuries, many of them based on the model of Paris. By 1500, 79 universities

of this sort existed in Europe, each having its own corps of all-male professors and a body of male-only students aged anywhere between 15 and 25. Their education consisted of attending professorial lectures, studying prescribed texts and participating in academic debates and exercises.

At this stage these emerging universities still had much in common with the far older higher learning institutions of China, India, Persia and Muslim Africa in terms of the limits imposed on them with regard to what they might teach and how they might do so. However, from the 16<sup>th</sup> Century onwards some European universities began to stand out from the rest as they sought to loosen the intellectual stranglehold of the Christian church, expand the scope of what they taught and increasingly pursue intellectual inquiry by the application of reason rather than religious doctrine. Leading this development were German universities, and in the 19<sup>th</sup> Century these steadily came to epitomise the modern scientific university in which unfettered teaching went hand in hand with unfettered research, together forming the basis of the concept of academic freedom. In the German phrase of the time, *Lernfreiheit* (a student's freedom to choose courses) and *Lehrfreiheit* (a professor's freedom to develop a subject and conduct research) were two sides of the same coin.

Unlike universities elsewhere in Europe and North America, British universities were slow to follow this lead and so, consequently, were the universities set up in the British Empire. Accordingly, in the *first phase* (1873-1918) of the five stages of university development in South Africa, the sub-continent's first university, the University of the Cape of Good Hope (established in 1873), concerned itself solely with teaching and examining, laying down what should be taught, how this should be examined and what its rules should be for awarding its degrees. The actual teaching was left to the post-matric classes run by a number of colleges affiliated to it, chief among which were the South African College in Cape Town, St Andrew's College in Grahamstown, Grey College in Bloemfontein and Victoria College in Stellenbosch. In the residential universities which developed out of these affiliated university colleges after 1918 teaching was also the primary activity at first; research began to be added to this only from the 1930s. However, as decisive in shaping their character was that dominating feature of modern South African life, ethnicity.

Whereas the University of the Cape of Good Hope had tried (not always successfully) to position itself above the ethnic rivalries between white English-speakers and white Afrikaans-speakers and even above the black-white divide, in the *second phase* of university development in South Africa (1918-1951) each of its former affiliated university colleges consolidated its character around a distinct ethnic identity, thereby accurately reflecting the strength of ethnic

feeling in the diverse society around it. Thus, by the time that each attained independent university status during this phase, it was well on the way to having a particular ethnic ethos. Accordingly, the Universities of Cape Town, Witwatersrand, Natal and Rhodes were predominantly white and English-speaking in the composition of their staff and students and used English as the medium of instruction, while the Universities of Stellenbosch, Pretoria, the Orange Free State and Potchefstroom were exclusively white and Afrikaans-speaking in their staff and students and used Afrikaans as their medium of instruction.

In exactly this mould too was a later creation, the tellingly named Rand Afrikaans University which was opened in 1967. The one institution solely for black South Africans, the South African Native College at Fort Hare (established in 1916 and re-named the University College of Fort Hare in 1946) did not gain independent university status in this period and remained an affiliate of an established university, initially of the University of the Cape of Good Hope's successor, the University of South Africa, and then, from 1951 to 1959, of the new Rhodes University. Its student body was largely African, its staff racially diverse and its medium of instruction English.

The University of South Africa was the only institution which purported to maintain a supra-ethnic character in this second phase of university development between 1918 and 1951, first as a parent to the university colleges mentioned above and then from 1946 as a pioneering distance-learning university which offered teaching by correspondence in either English or Afrikaans to its very diverse body of students scattered around the country. In only one later institution, the all-white University of Port Elizabeth (established in 1964) was a partial attempt made to follow the University of South Africa's dual-medium teaching model, but only because of specific local circumstances pertaining in Port Elizabeth. The norm remained ethnically-based institutions.

Thus, when in 1959 the South African government, as part of its policy of grand apartheid, embarked on a *third phase* of university development (1959-1982), it directed this at creating separate universities for each ethnic cluster within the population whom it labelled "Non-European" and at completely closing the so-called "European" universities to them. To oversee this first batch of apartheid-created institutions, the University of South Africa was requested to resume its earlier parenting role and to set the curricula and examinations for them. As was the case with the university colleges of the previous phase, in 1970-1971 these university colleges went on to attain qualified autonomy as the University of Fort Hare, the University of the North, the University of Zululand, the University of the Western Cape and the University of Durban-Westville.

However, when a second batch of poorly-resourced apartheid university institutions was set up between 1977 and 1982, mainly in nominally independent homelands, political considerations made it impolitic for the University of South Africa to take up a parenting role again and so the Universities of the Transkei (1977), Bophuthatswana (1980), Venda (1982) and Qwaqwa (1982) were founded as independent universities from their inception. To meet two other training needs of Africans which the apartheid planners recognised at this time, in 1978 the Medical University of South Africa was established north of Pretoria and in 1982 Vista University was set up with branches in the African townships of eight South African cities in a bid to channel the aspirations of the Soweto generation of pupils away from protests. The outcome of this flurry of university creation was that by the mid 1980s South Africa had 21 universities with a total student population of 221 761, as well as 15 technikons offering technical degrees. Each had a distinctive ethnic character, which was largely the result of a long history of ethnic-based politics in a country in which higher education institutions were almost entirely state-founded and state-funded.

Given their predominantly ethnic character, it is no surprise that South Africa's universities were tailor-made sites for ethnic mobilisation and political activity. For instance, Afrikaner nationalism, Anglo-liberalism, African nationalism and Black Consciousness all drew richly on the support and resources of particular campuses, while from the 1970s broad opposition to apartheid swelled at all black universities and some English-speaking ones, feeding into the wider popular challenge to the political status quo. Nor did the easing of statutory racial restrictions on admissions of blacks to white universities in the 1980s ease this tide, though what it did do was to begin a significant dilution of the longstanding ethnic uniformity on traditionally white campuses around the country in what might be identified as a *fourth phase* in the history of universities in South Africa (1982-2000). This development was accelerated by the official scrapping of apartheid restrictions on admission to universities, one of the many changes which accompanied the end of white minority rule in 1990-1994 and the inauguration of a fully democratic political system in 1994.

It was not until 2000, however, that the new democratic government began to spell out in detail its ideas to reform the South African higher education system in what became a *fifth phase* (2000-) in the history of such institutions in South Africa. Reacting against the divided, inefficient and inequitable system it had inherited, with its array of very well-resourced and very poorly resourced institutions, the state aimed to redraw this academic landscape entirely so as

to strengthen the weak and consolidate the strong among them. To this end it sought to create a single higher education system embracing all such institutions and compelled a number of universities either to merge with each other or to amalgamate with existing technikons to create so-called "comprehensive" universities. To bring the other technikons into this single system, they were consolidated and their status upgraded to universities of technology, six of which now exist.

From *studia generalia* in medieval Europe to varsities and universities of technology at the tip of Africa a thousand years later, the idea of a university has travelled far, both geographically and conceptually. Though what a 21<sup>st</sup> century South African university does and how it undertakes this task would be quite alien to the teachers and students of 12<sup>th</sup> century Bologna, Paris and Oxford, what has remained the same is the broad purpose of the institution, to provide the advanced specialised professional training required by the society around it. In that respect the sentiment expressed in the motto of the University of Bologna should remain the goal of all universities, that they should be a "fostering mother of studies".



## **2. MAKING THE RIGHT CHOICE**

*What are the options?*

**SOCIAL SCIENCES, PHILOSOPHY AND THEOLOGY**  
ANTON VAN NIEKERK

**THE ARTS**

TT GLOETE

**EDUCATION SCIENCES**

JONATHAN JANSEN

**MANAGEMENT SCIENCES**

EON SMIT

**BIOLOGICAL SCIENCES**

EUGENE GLOETE

**AGRICULTURAL SCIENCES**

EUGENE GLOETE

**PHYSICAL SCIENCES**

EUGENE GLOETE

**ENGINEERING SCIENCES**

ARNOLD SCHOONWINKEL

**HEALTH SCIENCES**

WYNAND VAN DER MERWE

**LAW**

MARINUS WIECHERS

**SPORT SCIENCES**

TIM NOAKES

VARIOUS

4

# SOCIAL SCIENCES, PHILOSOPHY AND THEOLOGY

**Anton van Niekerk**

The term “social sciences” includes subjects like history, psychology, sociology, anthropology, social work, political science, information science, economics, geography, journalism (or media studies) and philosophy. It normally consists of a large grouping of subjects at the university, and it seems as if they cover such a variety of topics that it isn’t always clear as to why they all form part of the “social sciences”. At some universities social sciences form a separate faculty. Sometimes they form a faculty along with languages and the arts, but usually they are grouped separately. The subject field of economics (the biggest single subject at most universities) is seen as a social science – in fact, one of the most important social sciences – but is usually found in the faculties of commercial sciences or economic and management sciences. Philosophy – the oldest of all the disciplines at university – is often grouped along with the social sciences and sometimes with the arts and/or languages. Philosophy as discipline has a somewhat different focus and approach than the typical sciences at the university, but has a big influence on the other sciences, including theology.

## THE ORIGIN OF THE “SOCIAL SCIENCES”

Except for philosophy, the differentiation of the social sciences in their different subject fields is a relatively new phenomenon at most universities. When universities originated in the Middle Ages it was mostly philosophy and theology that were studied (during the Middle Ages these subjects weren't clearly distinguishable from one another) along with medicine, mathematics, languages and rhetoric (debating). The subjects that today are known as “natural sciences” weren't really studied separately from philosophy, and although with the start of modern times it claimed more and more separate attention, right up to the eighteenth century, it was still widely known as natural philosophy.

Up to then it was common practice to study science at the university as a so-called unitary science. It wasn't strange to get an overview of just about everything which up to that time was known and available as “scientific” knowledge – something which we struggle to understand in light of the explosion of knowledge and science in our time. Of course this doesn't mean that all university students in those years successfully mastered such an overview. It is, however, interesting to note that the best-known figures in the formative years of the modern times in Western intellectual history were geniuses who made important contributions to a variety of areas – areas which were restricted by our current distinction between natural, human or social sciences.

René Descartes, for example, was the founder of the modern philosophy, but also a well-known mathematician and the founder of trigonometry. Blaise Pascal, another important French thinker, was a philosopher as well as theologian and chemist. Immanuel Kant and GW Leibniz, two of the best-known philosophers of the eighteenth century, made important contributions to mathematics and the natural sciences.

The multiplication of a multitude of “sciences” (for example physics, chemistry, sociology, psychology, social work, et cetera) was mainly the result of a *knowledge explosion* in the nineteenth and twentieth century. For nearly two centuries we find that knowledge became continuously more specialised, and that different questions, which correspond with more and more specific areas of scientific research (and therefore “subjects”) occurred and are developed. Biology gets refined into microbiology, zoology, botany, genetics, etc. Each becomes a “science” with its own field of research, sets of problems, methods and approaches. After these developments science is no longer studied as a “unitary science”, but as separate “sciences” delivering knowledge that is more and more specialised. It is actually only since the last part of the twentieth century that due to a variety of developments (for example the discovery of the

molecular basis of all living things in the biological sciences) this tendency has been somewhat reversed and that the necessity of multi- and interdisciplinary studies have developed – studies where the potential contributions of a variety of sciences is acknowledged and examined in the solving of problems.

The idea that the reality of human life can also be “scientifically” examined, originated largely in the course of the nineteenth century. Figures like Auguste Comte (the founder of the science of sociology), Karl Marx (who insisted on characterising his socialism as “scientific”), Sigmund Freud (who gave psychology a big push forward with his discovery of man's subconscious and the importance of our dreams in the understanding of who we are), Max Weber, Émile Durkheim and many others who started examining man as a conscious object of scientific research. We see that the different social or human sciences slowly started distinguishing themselves from one another and became more self-reliant and independent “subject fields”. That which today we distinguish as the sciences of psychology (the study of individual human behaviour), sociology (the study of human behaviour in a social context), social work (the study of ways to improve social welfare) and political science (the scientific study of politics) were once all part of one big field of study.

## THE RELEVANCE OF THE SOCIAL SCIENCES TODAY

This does not mean that social sciences are a useless exercise. Today we understand a lot more about human reality, thanks to social sciences. For example, we understand the phenomenon of urbanisation – something that can almost be called a “law” of modernising societies – a lot better than before. This type of knowledge which is acquired on large scale in the social sciences can, if understood and applied correctly, be of huge value in political policy decisions. To give just one example: Many economic historians still allege that it is mainly thanks to the influence of John Maynard Keynes' ideas on the government of president Franklin D Roosevelt that policies were put into place in the USA in the 1930's which brought the Great Depression to an end.

*A study of the social sciences is therefore quite necessary as well as very relevant in our time and circumstances.* It is true that South Africa has an urgent need for natural scientists and engineers. It is however also true that some of the biggest problems in the South African society, in the past as well as the present, are relationship problems – problems which fundamentally have to do with man's inhumanity towards his fellow people. We will not solve those problems – prejudice, discrimination, distrust, crime, corruption – by only

training engineers. We need just as many people who strive to know and understand the social reality as well as possible.

In one of his writings Hennie Rossouw develops a number of important arguments about the way in which natural sciences/technology and social sciences should and are supposed to complement each other.<sup>1</sup> The social sciences can play an important role in *humanising* the technique and the technology, and focusing technique and technology on the improvement of human welfare and quality of life, rather than making them self-supporting values which are only pursued and expanded for their own sake. It is worth taking note of the three points which he uses as motivation.

Firstly, the human or social sciences can counteract the *dehistoricising* that technology often brings about, by the promotion of an *historical awareness* (in history and all other disciplines that approach the study of problems historically, for example political science, general linguistics, anthropology, archaeology and sociology). This means that the historical sciences can help us to remember where things and ideas came from, so that we can learn from history and not repeat the mistakes of the past.

Rossouw's second and third points have to do with the contribution that two other disciplines, namely philosophy and theology, to which I'll briefly refer, can make. Philosophy is the study of thought categories and/or structures (for example concepts and ideas) that we use to think about, understand, interpret and try to improve the world (values). Philosophy is of great value in helping us to understand and criticise the meaning of terms and ideas that play an important role in how people think and what their preferences in life are. Rossouw argues that in our current world we increasingly lose our moral sense or become morally disorientated. We increasingly doubt which values are of importance. We become victims of people who seemingly do not have or acknowledge values (for example criminals and corrupt politicians, officials and businessmen). The human sciences, secondly, can therefore help us to understand why society is facing moral decay and show us how to promote a renewed *moral awareness* in our society.

Lastly we live in a world that has been profanised, in other words a world where our sense of the religious dimension of the world becomes blunted and where we increasingly believe and live in the moment and the pleasure that the present brings. Theology as well as religious studies, philosophy of religion, sociology of religion, psychology of religion and subject fields like the study of ancient languages and cultures are all disciplines that enable us to better

understand our sense of religion and religious awareness. What we cannot deny is that religion plays a very important role in most human societies – especially in Africa. Think for a moment of the influence and impact of religion on most countries in the Near East, and the effect it currently has on world politics. And then we're not even talking about the influence of religion on the history of Western Europe and therefore on Africa. Theology and the other disciplines mentioned above not only have a place at universities in order to train clergy. It also has its place because religion is an important part of people's lives and is therefore an integrating part of the human reality that human and social sciences are trying to understand.

<sup>1</sup> Rossouw, HW. 1993. *Universiteit, wetenskap en kultuur*. Cape Town: Tafelberg. p. 119-123.

# LANGUAGES AND THE ARTS

TT Cloete

Universities are old institutions. The oldest universities educated in the *trivium* (grammar, rhetoric and dialectics to which literature also belonged) and in the *quadrivium* (accounting, geometry, astronomy and music). It is significant that at the time music was classified along with the more exact geometry, arithmetic and astronomy. Through the old *trivium* and *quadrivium* we can see that literature and arts are at the origin of university affairs. Today we group these fields of study together under the heading of “the arts”.

## MAIN BRANCHES OF THE ARTS

There are several main branches of the arts, but the most important distinction is between the spatial or visual arts and the duration or course of time arts.

The art of building and fine arts (sculpting, painting, drawing and photography) are *spatial arts*. At the same time they also are visual arts, and you can even experience the art of building and sculpting with your sense of touch.

The music (singing, instrumental music, opera) and literature (poetry, prose, drama, et cetera) are *duration or course of time arts*. Rhythm is duration; course of time follows a certain pattern, and is apparently related to our heartbeat. The art of film is related to drama and opera and can also be classified under the course of time arts.

The wonderful thing is that a person can create art with their body and face, for example the many forms of dance (from the oldest body arts), ballet, mime, acting, fencing or jujitsu.

At university all of a person’s senses along with your intellect becomes involved and developed by the arts. The visually perceivable art of painting

or architecture develops the optical sense, music as acoustic art develops your auditory and bodily perception. A person can experience a building, an ornament or a sculpture as tactile art with their sense of touch.

Some artworks are utensils; that is the so-called serviceable art. A piece of architecture is both beautiful and useful. But other artworks mainly have an aesthetic function, for example a painting, even if it has a trade or monetary value.

For a student in the arts it is therefore important to know that the aesthetic – how beautiful something is – is of such vital importance that some utility items at the same time even are beautiful art items, for example the Gothic cathedrals of Europe, the temples Angkor Wat and Angkor Tom in Cambodia, or the simple fisherman’s huts along our coast. Even when buying a car the aesthetic principles apply. Car owners want a beautiful, elegant car. Originally the pyramids of Egypt were mausoleums, but today we see them as masterly building art works. One of the prettiest buildings on earth is the Taj Mahal, but it was also built as a mausoleum. Some of the most beautiful sculptures and reliefs are those on temples, in Java (the famous Borobudur), in India, in Central America, in Egypt, Greece and Italy. Today the ruins in Zimbabwe are not protected and admired for their usage value as a fortress or temple, but for their beauty.

There are many other things not primarily meant as art, but that got art value, for example technical objects like a knife, or a sword primarily designed for war. Homer’s description of Achilles’ shield in *Ilias* changes a shield primarily meant for fighting where another person is killed into an artwork. Old decorated manuscripts, like those in the Bodleian library at the University of Oxford, which weren’t primarily meant as artworks, but as historical, religious or moralising reading material, are today treasured as the most beautiful aesthetic objects, not only because of their miniatures, but also on account of their beautiful calligraphy, the valuable way in which these books are connected to the pre-industrial era. Museums everywhere on earth are full of “beautiful” aesthetic objects that weren’t originally created for aesthetic purposes.

## ARTS HAS A CENTRAL PLACE AT A UNIVERSITY

The study of the arts belongs at universities. *Art objects in any culture are from the earliest objects made by man and are found in many contexts even before writing was discovered.* Early man was already an art man thousands of years before he became a scientific man. The earliest art usually has its origin in magic

and religion, for example dance, or the rock art and engravings of the San in our country or the land of the Aborigines in Australia, the rock art at Twyfelfontein and the so-called White Woman from the Brandberg in Namibia. The prehistoric drawings in Southern France and Northern Spain are, like the drawings in the cave of Alta Mira, some of the most beautiful and famous art works.

*Art objects, written art works and art in general are not only of the oldest artefacts, but also the most lasting*, because man is inclined to save artful objects, also at universities – not just those that are contemporary or that of the own country, but also those from earlier and elsewhere. In many of man's activities the one thing replaces the other very quickly, but art objects continue to exist for many years and are irreplaceable. A San drawing on a rock in South Africa or a rock drawing in Australia are just as contemporary as a Picasso painting. Today's news ends up in the rubbish bin today, but "literature is news that stays news", like the English poet Ezra Pound once said.

*The arts and the sciences at the universities are related to each other, because they deal with the same reality.* Sometimes arts and science are combined in one person. CL Dodgson's two names are actually symbolic. As Dodgson he was an English mathematician, but as Lewis Carroll he was the author of *Alice's adventures in Wonderland* (1865), a well-known book that is still being reprinted and translated into other languages, in the same way that Mozart's music is meant for everyone from children to elderly people. The statesman, politician and philosopher Jan Smuts read poetry. Leipoldt was a physician. Einstein read literary works and said that fantasy and imagination have just as much right of existence as the intellect. Nietzsche saw the arts and sciences as correlates. Cicero was both a statesman and writer. The previous pope was not only a theologian but also a poet.

The word *quark* used by natural scientists, comes from a poet by the novelist James Joyce's *Finnegan's wake*. Kitty Ferguson's *The fire in the equations*, a book in natural sciences, refers to "[The] beauty in physics [and] in science". One chapter has the meaningful title "The muse of science": "It is more important to have beauty in one's equations than to have them fit experiment ... Beauty is a familiar pointer in physics ... The mathematician's patterns, like the painter's or the poet's, must be beautiful ... Beauty is a practical tool for finding truth ... Black holes are mathematically beautiful ..."

## CAREER OPPORTUNITIES

The university is an institution that prepares you for an occupation. Certain arts (for example the performing arts) are aimed at a profession and prepare the student very specifically for a certain occupation, for example students in architecture. Students at a conservatory get practical training in singing or the playing of certain instruments. Some universities also teach drawing, painting and sculpting in their courses on art history and art appreciation.

With regard to literature, some universities do offer writing classes or workshops, but in the case of singing or music students, these workshops, training in writing, are only meant for people who already have a literary talent. Without an innate talent or ability you can teach no-one to write, draw or make music.

Careers that the languages and language arts prepare you for at university, are the education, librarianship, journalistic work in the media, newspapers and magazines, the television and radio, work in archives and museums, work at publishers, translation work, as well as working with dictionaries, secretarial work and work in interpreting arts (stage and theatre).

# EDUCATION SCIENCES

**Jonathan Jansen**

For those who choose a professional field of study such as education, the transition to university is nearly always exciting. Someone who decides on the noble profession of teaching must prepare him- or herself for two lives. The first is that of the lecture room, where lecturers will teach you new theories, different teaching methods, new ways of assessing learners with learning problems, ways in which the computer can be used to facilitate teaching at school, as well as several new changes with regard to teaching. The other life is the one in schools. More and more universities currently require students-teachers to spend more time in schools and less in lecture rooms.

Other than in the case of students registering for other degrees, you are judged by two communities: the academic community (or the staff of the university), as well as the teaching community (or the staff of schools). Student-teachers therefore have a special challenge, because you have to find ways to meet the requirements of both communities. Let us look at a few examples.

- lecturers want to know how well you understand the teaching assignment; teachers want to know how well you can teach;
- lecturers want to know if you have read widely about their subject; teachers want the assurance that you will be able to handle a class full of energetic children;
- lecturers want to know if you have mastered the theoretical principles of assessment; teachers want proof that you can design a multiple choice questionnaire for mathematics.

These differences shouldn't be over-emphasised, especially since good teachers as well as good lecturers feel strongly about these matters; the fact of the matter is that a bubbling busy classroom demands different things from professional people than the relative calm atmosphere of the lecture room.

Student-teachers are typically inclined towards the practice. You often hear them say: "Just show me how to teach and forget all these theories". But teaching is much more than the patching together of techniques; it is a profession where insight into what you do, why you do it, as well as which alternatives you could have chosen, are aspects that distinguish the very complex action called teaching from other simple manual labour. For first-year students the most important aspect in this regard is to understand that theory and practice, university and school, lecturer and teacher are all important facets of the experience in its entirety during which someone becomes a professional teacher.

## THE PERSONALITY AND CHARACTERISTICS OF A TEACHER

Students who decide on studying teaching are special: they learn to make a difference in the lives of children; they are idealistic about the potential of all children; they have a passion for what they do. Those who decide on teaching like to explain things to others. Nearly all teaching students that I know, can still remember how they lined up their dolls or action figures against a wall to "teach them". That includes teaching everything, from personal behaviour to basic mathematics. Those who decide on teaching often have first-hand experience of the joy of teaching Sunday school classes or teaching basic survival skills to young boys in a Scout group. Those who decide on teaching love to manage people and plan events; they like to listen to others and give advice. Those who decide on teaching flourish more than anything on the excitement of personal interaction with young people and treasure the opportunities where they can lead and inspire.

## ROUTES TO A TEACHING QUALIFICATION

*You can become a teacher with nearly any combination of high school subjects.* Those who want to become high school teachers must present at least three school subjects in matric (for example Life Sciences, English or History). The school subjects of those who want to teach in primary school will determine their electives, depending on what grades they are planning to teach. One of the most important pieces of paper what will determine your future, is your grade 12 certificate with exemption (or endorsement). Contact tertiary institutions in

good time, before making the wrong decisions with regard to school subjects; since it is a decision that can influence your future for ever.

*There are two main routes to becoming a teacher.* You can do a four-year degree (called Bachelors in Education (BEEd)), during which you get advanced training in your teaching subjects or learning areas (for example Geography or Mathematics) but can combine this training with education theory, where you get to learn more about educational objectives, theories and principles, as well as courses in methodology where you learn how to teach.

You can also complete your first degree in any other faculty (for example a BComm or a Bachelors in Economic and Management Sciences), and then do a one year Postgraduate Certificate in Education (PGCE). During this course the focus falls mainly on theories and methodology courses.

How do you decide between BEd and PGCE? It is a personal choice. Students who decide on BEd are usually sure that they want to become teachers, while PGCE students often decide on another degree and only later realise that they want to add a teaching diploma to their qualifications.

## CAREER OPPORTUNITIES

Several education graduates prefer to teach in public schools. Nowadays however, an ever growing number of teachers with degrees in education start their own businesses. Students in the Early Child Education and Foundation phase start their own preschool centres where they act as business managers as well as preschool leaders and teachers. Several teachers are also very suitable for the education sector, due to their teaching and training skills and often work as training specialists in the private sector (for example in banking or in computer companies). Education graduates of the 21st century are very mobile and some choose to spend some time teaching elsewhere (for example the United Kingdom), but most of them return home after they have gained some international experience.

In short: Although most graduates prefer to teach in public schools for the whole of their careers, teachers are now, more than ever, suitable for nearly any job that entails giving training. South African teachers are also highly in demand in other countries. Lastly, several teachers find the academic context so interesting that they prefer to keep on studying long after they have obtained their first degree. For example, they obtain an honours degree, a master's degree and finally a doctoral degree and create the possibility of a job at a university.

The most important thing that you can learn on your road to becoming a teacher is to never, ever lose the connection to the most important calling that a person can choose. Never allow anybody to cloud your calling!

# MANAGEMENT SCIENCES

## Eon Smit

As prospective student I want to have the assurance that the study field I choose will ensure that I get a job. Maybe more than just a job – a career in which I can make a significant contribution during my life in order to create wealth for my country, those around me, and of course also myself. Every day we read in the press about business leaders who help the economy to grow, share the wealth with their employees, but who also benefit financially. Many of these business leaders have studied management sciences at university.

Management sciences is a term which include a variety of different subjects – the common denominator is that the knowledge content of these subjects enable you to do complex tasks or manage people in the governing sector, big companies or in you own business enterprise.

The subjects that you choose are packaged in such a way that it focuses on the different functions of the manager. The subject *Business Management* focuses on a range of general management functions which take place in any organisation – the management of people, the management of funds, the management of clients and the management of production and sale functions. The content is general – rather than very technical – in preparation of a career as general manager – someone who controls a range of departments in an organisation with profit motives.

On the other hand there is a subject like *Public Management* where a student is taught in the management of government departments, provincial authorities or local councils. The aim here is not to make a profit, but to spend budgeted funds – normally gained from the community by means of taxes – responsibly in the best interests of the community.

In *Human Resource Management* you will learn how to appoint, productively manage and properly compensate staff members. You will also learn how to communicate with people, how people operate in groups and how to negotiate

with you staff and trade unions. Your leadership abilities will be developed and you will develop an appreciation for variety in the workplace. Furthermore you will learn how to adapt your organisation to the ongoing change within the environment you manage.

In *Financial Management*, *Accounting* and *Auditing* you will study the broad financial environment where you will learn the principles of healthy management of an enterprise's finances in order to ensure survival and growth. In *Financial Management* the general management aspects of enterprise capital, the acquiring as well as the best appropriation of it is put under the microscope, while *Accounting* has to do with the compiling of the financial reports of an enterprise. It is the route that is often chosen by students who want to enter the auditing field.

*Economics* studies the totality of activities within a country that have to do with the production of goods and services and the distribution of income which have been attained in this way. It is therefore implicit that the study field for economy includes the markets – the labour market, the commodities market and the financial markets. The study terrain of Economics is broad and if you read the newspapers and watch television you will know that it affects each of our daily lives. Fuel prices are increasing, inflation is rising, the world economic system is facing significant challenges and we are all getting a little bit poorer. Because the field of economics is so broad, it provides a home for people who are strong in mathematics, but also provides good possibilities for more philosophically-oriented people. Job opportunities range from the government sector, the big private organisations and international organisations, such as the World Bank, International Monetary Fund and the United Nations.

Many universities make it possible for you to study *Mathematics* as a core subject with the portfolio of management subjects, often in combination with *Mathematical Statistics* or *Actuarial Mathematics*. These subjects will fit you like a glove if you have strong mathematical skills, and it leads to a much sought-after specialist position in the job world – usually in cases where there are big uncertainties and where it is necessary to correctly determine the risks of business decisions. Another study field for people with an aptitude for figures is *Logistics*, which has to do with the planning of distribution and transport channels with a focus on road systems, harbour systems and air systems.

The subjects mentioned above represent the heart of the so-called Management Sciences. Often the university will also offer you a choice that will enable you to combine management subjects with subjects in law, humanities, agriculture or engineering in order to prepare you for the career path you have chosen. Often when students start studying they don't yet have absolute clarity

about what their future job will be. If you feel that way, don't worry; thousands of students before you were also unsure, but later became very successful in their specific careers. If you are still unsure, try to keep your subject choices as general as possible. That way you can change your course without having to complete any extra years of study. Your faculty secretary or his or her assistant will give you good advice in this regard.

*In order to be successful in your studies, it is important to understand that it is not the difficulty of the work that causes students to fail – it is the amount of work.* It is much more work than you were used to at school and nobody is going to check if you are keeping up. Therefore I always give students the following advice:

- come to class prepared, without necessarily having mastered the work, but know what to pay attention to during a lecture;
- don't miss classes, because catching up on work wastes valuable time;
- “get your hands dirty” by working through numerous examples;
- ensure every day that you understand the day's lectures – without trying to memorise it;
- make full use of the support that is available, for example computer programs, the library and, of course, the lecturers – who welcome students who make appointments and come to consult them.

In South Africa (and Africa) there is a shortage of management knowledge. There are big opportunities in our country and on our continent, especially for entrepreneurs. I hope your studies in the Management Sciences will one day help to bring relief to this shortage.

# BIOLOGICAL SCIENCES

**Eugene Cloete<sup>2</sup>**

## BIOCHEMISTRY

The role of bio-molecules in all living systems (fungi, parasites, bacteria, plants, animals, humans and insects) are studied in order to explain the life processes, for example photosynthesis, the physiological effect of hormones, the basis for growth and differentiation, metabolic control and structural and functional aspects of macro molecules or the cell. You can also examine the functions of vitamins and hormones, the functioning of the brain and nerves as well as the body's defence mechanisms against infections, cancer and other diseases. If this interests you, you will be able to apply your knowledge to the fields of agriculture, veterinary sciences and medicine by for example determining the causes of diseases and developing preventative medicines.

Biochemistry provides nearly unlimited opportunities for an exciting and challenging career in industries (for example fine chemicals, food, pharmaceutical and refuse processing firms), research councils (MRC, LNR, KANSA, ARC) and institutes, academic institutions, the CSIR as well as forensic and pathology laboratories.

## BIO-INFORMATICS

Bio-informatics is applicable to Computer Science, Mathematical, Statistical and Information Technologies on biological data. Biological data in the form of protein or nucleic acid orders, complete genomes, macro molecular structures,

<sup>2</sup> The contributions and comments of the following people are gratefully acknowledged: Stroh, A, Kirsten, J, Malherbe, JB and Lubuma, J – Faculty Natural and Agricultural Sciences, University of Pretoria, Pretoria.

expression levels, transcription levels or models or metabolic lanes are used. Bio-informatics can be applied on different levels, from pure application of biological data to programming and algorithm development. Bio-informatics can be applied in agriculture, veterinary science, medicine and IT-related fields.

Bio-informatics provides career opportunities in applied sciences as well as research. It includes universities, research institutes, pharmaceutical companies, biotechnological companies and related industries.

## HUMAN PHYSIOLOGY

In Human Physiology the workings of the human body is studied. This field of study is ideal if you are very interested in the human body, which is more complex than any machine or computer. In order to truly understand it, you must have knowledge of how all the millions of pieces that the body consists of function separately and together. Understanding and knowledge of the nature of the underlying molecules, cells, membranes and organs will be of no value if you don't understand how these body parts work together in the total living being.

Research is done in cooperation with medical teams in private and government research institutes, for example the CSIR, MRC, SABS, pharmaceutical companies, universities and industrial bodies, specific government departments (for example the Department of Health) and health resorts. Physiologists are also found in several other fields, for example as teachers and lecturers at schools, colleges and universities. They act as consultants and representatives in the following fields: sport physiology, biostatistics, bio-engineering, industrial hygiene journalism, medical technology and in the business world as representatives of pharmaceutical companies.

## GENETICS

Over the past few years Genetics has expanded from the more classical population level approach, which mainly focused on the study of heredity patterns of characteristics, to a strong focus on the study of the molecular basis of genetic material. The arrival of recombinant DNA technology and, more recently, biotechnology has paved the way for an increasing series of available technologies. These technologies continuously enrich the existing research strategies and provide new opportunities for research, not only in Genetics, but also in other living sciences.

With a thorough background in Genetics you will be prepared for a challenging career in a variety of professions within a diverse range of fields. Nevertheless, it is important to remember that your level of training or qualification will play a big role with regard to the type of work where you as geneticist can become involved in. Most career opportunities in genetics incorporate work in a laboratory environment. While some laboratories mainly concentrate on research and analytical work, others focus more on routine and diagnostic work, like DNA sifting tests and testing of numerous genetic diseases and syndromes. Job opportunities, depending on your research focus, will also include fieldwork during which field experiments or material collections are done. There are also opportunities in private diagnostic and forensic laboratories. Geneticists can also be involved in teaching and education at several academic institutions.

A background in genetics is also valuable in other occupations like pharmaceutical representatives, or, if combined with an appropriate degree in law, a patent lawyer.

## BIOTECHNOLOGY

Molecular biotechnology involves the use of in vitro genetic manipulation and recombinant DNA methods to genetically modify plants, animals and micro-organisms. This has become possible thanks to greater insight in the composition, structure and functioning of the genetic material in the cells of all living organisms. Biotechnologists make it their goal to repair, modify or strengthen specific characteristics in their target organisms in order to cover a broad spectrum of practical applications including improved food production, disease treatment, conservation and bio-correction. The growing series of new available technologies continuously enrich the existing research strategies and provide new opportunities for research, not only in genetics and biochemistry, but also in applied life sciences, like plant science, microbiology, plant pathology, the veterinary sciences and wildlife sciences.

It is clear that biotechnology will play a decisive role in the future of the medical, agricultural, veterinary and ecological sciences. It is our responsibility to ensure that this progress is done in a responsible and well-controlled way so that it doesn't have a negative influence on the environment and our own health.

A background in biotechnology will enable you to compete for positions in a wide spectrum of areas in the living sciences. Career opportunities in biotechnology include work in a laboratory environment. Biotechnology laboratories can form part of an industrial, research or academic facility.

There are an increasing number of opportunities at private biotechnological laboratories that specialise in contract work. Biotechnologists can also be involved in teaching and education at several academic institutions, or work as pharmaceutical representatives. It is important to remember that the level of education or qualification will be a strong determining factor with regard to the type of work that biotechnologists can get involved in.

## MICROBIOLOGY

Microbiology includes the study of micro-organisms, mainly bacteria, viruses and fungi (mould and yeast). The knowledge of taxonomy, metabolism and molecular biology are applied in ecology (the preservation of the environment), food microbiology, industrial microbiology, biological management and genetic manipulation of organisms.

Microbiologists have a wide variety of career choices at a variety of employers with activities ranging from basic research to applied activities. Here are a few examples:

- Quality control, research and technology development at food and dairy industries, beer breweries, wineries and the bakers' yeast industry;
- Research on products of ethanol, antibiotics and other chemicals;
- Research and consultation with regard to corrosion management and efflux treatment;
- Research with regard the microbial recycling of gold and uranium;
- Research and routine work as medical or veterinary microbiologists;
- Research positions at institutions like the CSIR, the research institutes for animal and dairy science, plant protection, vegetables and ornamental plants, viticulture and oenology, and the Medical Research Council;
- Lecturers and researchers at academic institutions.

## PLANT SCIENCE

Plants are remarkable organisms, but we know way too little about them and their use for people. We already know that plants are the world best "factories" of chemical compounds. In Medicinal Plant Sciences you will get an overview of the discovery and use of plant medicines and important phytochemical molecules produced by plants. Some of these compounds are poisonous and play an important ecological role since it is secreted and serves as protection

mechanisms against herbivores. In Crop Biotechnology molecular methods are discussed for the examination of total crop plant physiology used by model plants. Gene and promoter identification and transfer techniques for crop improvements are also examined.

In Plant Ecology and Plant Diversity the rich and diverse vegetation of South Africa is studied with a view on conservation and management for our descendents. Studies in Plant Science provide you with the opportunity to learn more about different types of plants and their use for humans and animals.

As plant scientist you can work at the National Botanical Institute, a variety of research institutes, the CSIR, seed merchants, nature conservation institutes, the Agricultural Research Council, academic institutions and the Department of Education.

## ECOLOGY AND CONSERVATION BIOLOGY

Ecology as science explains the spreading and numbers of organisms through the unravelling of the interactions between organisms and their environments. Conservation biology focuses on the application of ecological principles to the benefit of the preservation of biological diversity. Together ecology and conservation biology form the academic platform for the preservation of all forms of life on earth to their own benefit and to the benefit of each other.

Besides the classical methods which are based on the descriptive and experimental approach, computer-based methods like geographical information systems and distance observation are currently also used. Ecology as subject field is a very dynamic field which offers exciting research and job opportunities for graduates who are interested in the discerning use of natural systems. A background in ecology and conservation biology is also of great value in other scientific fields of study.

With a background in Ecology and Conservation Biology most career opportunities are environmentally based. Graduates find work at statutory and private conservation organisations, at organisations involved in the direct or indirect development of natural resources, and with the necessary academic background, at academic and training institutions.

## ANIMAL SCIENCE AND ENTOMOLOGY

Animal scientists study the patterns and processes subjacent to ecology, as well as the threats that biodiversity faces in landscapes influenced by people. The subject field includes interdisciplinary focus areas in Ecology, Physiology,

Physiological Ecology, Behavioural Ecology, Macro Ecology, Conservation Ecology and Evolutionary Biology to a dynamic student body.

Graduates can look forward to a variety of career opportunities at nature conservation institutes, environmental consultants, conservation planning agencies, the biochemical and biotechnological business, educational institutions and the business sector. Career opportunities include the full spectrum of modern research, development and training. It can range from full-time participation in the field to full-time training activities. The above often includes a stimulating combination of analytical, field and human research oriented work.

# AGRICULTURAL SCIENCES

**Eugene Cloete<sup>3</sup>**

## AGRICULTURAL ECONOMICS AND RURAL DEVELOPMENT

The activities of agricultural economists take place on micro- and macro-economic level. Agricultural economists who operate on micro level focus on matters related to resource usage in the production, processing, distribution and usage of agricultural products. Production economists examine enterprises' needs for resources and give them feedback. Market economists focus on the flow of food and fibre through the market channels to the final destination as well as the determining of prices in each stage. Financial economists are concerned with matters with regard to financing or enterprises and the providing of capital for these enterprises. Resource economists concentrate on the use and conservation of the country's natural resources. Other agricultural economists are interested in compiling government programmes for certain commodities which support the income of farmers as well as the low-income consumers of food and fibre products.

Agricultural economists are in an ideal position to grab current opportunities and work along with the government to formulate agricultural policies in order to optimise income in poor areas. The national and local departments of agriculture are both important employers of agricultural economists and are involved in several tasks and projects. Agricultural economists take part in the development of strategies aimed at supporting farmers who previously got little or no support from agricultural advisers. The task of developing such

<sup>3</sup> The contributions and comments of the following people are gratefully acknowledged: Stroh, A, Kirsten, J, Malherbe, JB and Lubuma, J – Faculty Natural and Agricultural Sciences, University of Pretoria, Pretoria.

strategies consists of many facets, from marketing to market development to price policies and agricultural financing.

Agricultural economists also play an important strategic role in the private sector. On the macro level agricultural economists are taken into service by international food and export companies to study the factors that influence trade in agricultural products. The agricultural economist's knowledge of variables in the macro economy, like inflation, exchange rates and interest rates, places him or her in a position to identify the result of several macro-economic policies on the food and fibre industry and finally the whole population. The multi-disciplinary nature of agricultural economists' training ensures that they can negotiate with specialists in the field. That makes the agricultural economist a nearly indispensable part of some organisations and government departments.

## PLANT PRODUCTION AND SOIL SCIENCE

Plant Production and Soil Science are research areas which integrate the basic natural sciences (Chemistry, Physics, Mathematics, Statistics, et cetera) as well as applied natural sciences (Ecology, Plant Physiology, Plant Nutrition, Soil Chemistry, Hydrology, et cetera) that are necessary to manage natural and agricultural resources responsibly.

Career opportunities include the following:

- Education and training at academic institutions;
- Research and management at several public institutions, for example the Agricultural Research Council, the CSIR, provincial agricultural and nature conservation departments, the Botanical Research Institute, the National Parks Council and national agricultural and food processing agencies;
- Research and management at several private institutions, for example companies involved in seed, fertiliser and plant protection research and development, as well as environmental management planning; nurseries; vegetables, fruit, ornamental plants and cut flower producers; irrigation;
- Advice services for knowledge transfer;
- You can also be your own employer by managing your own farm or nursery for extended (field) and intensive (tunnel or greenhouse) production of several crops, like vegetables, fruit, ornamental plants and cut flowers.

## PLANT PATHOLOGY

A plant pathologist is trained as a specialist in plant health. In order to keep plants healthy, the micro organisms which cause plant diseases, the interactions between micro organisms and plants, how plants are affected by diseases and how the disease can be combated are studied. This knowledge is important to help farmers, growers and gardeners manage plant diseases.

Plant pathologists have a wide variety of career choices that range from high technological basic research to practical fieldwork. Career possibilities include those at academic institutions, institutes of the Agricultural Research Council, the SABS, agricultural chemical and seed companies, co-operations and private estates. Plant pathologists can also run their own practices or work as consultants.

## ANIMAL AND WILDLIFE SCIENCES

Animal and Wildlife Sciences is the science and practice where tame and wild animals are utilised to people's benefit. The practice and application of the science is done in a responsible way according to a code of ethics without the animals being abused or the environment damaged. The work terrain for Animal and Wildlife Sciences stretches from primary farming and game reserves to the marketing of animals and the processing and use of animal products.

Animal and wildlife experts can be commercial or wildlife farmers, or be involved in the management of farms and game reserves. They can practise as specialist consultants in production systems, animal feeding, animal genetics and breeding, animal products like meat, milk, wool and in the management of the natural environment according to ecological principles. They can also be entrepreneurs in agriculture and related industries and achieve success in the business world and management. The forage industry (ruminants, single stomach as well as pets) is surely the animal scientist's biggest employer. They can also become scientists who develop knowledge and strive towards more effective production by doing research and seeking answers for problems. They can be administrators in several enterprises in the animal and wildlife industry, for example at breed associations, agricultural unions, in government service, at semi-government institutions or in commercial banking. They can also act as teachers at schools, lecturers at colleges, technicians and universities, or provide training to farmers, game rangers and other people who want to be trained in the fine art of animal and wildlife management. The workplaces for animal and

wildlife scientists are therefore on farms or in game reserves; in a laboratory or an office; in an auditorium, classroom or in the outdoors where people can be addressed or demonstrations held; or in boardrooms and business rooms where strategies are planned.

## FOOD SCIENCE OR FOOD SCIENCE AND TECHNOLOGY

The food industry is South Africa's biggest production industry. Nowadays all food is processed to a greater or smaller extent. Trained people are necessary to develop and expand the food industry, which feeds the country's inhabitants and earn valuable foreign currency through exports. Food scientists study the chemical composition, structure and nutritional value of food. They monitor and do research on the chemical, physical and biological changes in food during processing, preserving and storing.

Food scientists with very marketable knowledge and professional skills work in South Africa and worldwide as researchers, product developers, production managers, quality controllers, technical or process advisers and entrepreneurs in the food and related industries. The food scientist's work environment includes laboratories, food production sites, business premises, training facilities, wholesalers and retailers, government institutions and research organisations. Food scientists also work in industries and companies that produce materials (for example packaging and additives like colourings and flavourings) in the food industry or are secondarily involved in food production and sales. Food scientists are trained to develop food products that meet the dynamic needs of modern consumers. They also make an important contribution to combat hunger and malnutrition through the development and creation of affordable, healthy food.

There is a worldwide need for graduates with training in Nutrition as well as Food Science and it is also a reality in South Africa. This combination provides career opportunities in product development, technical sales and marketing, research and food legislation, quality control and nutrition and food analysis, food service managements, consumer journalism as well as training and education. These people can be seen as consumer supporters who serve as link between consumers and the role players in the food industry.

# PHYSICAL SCIENCES

**Eugene Cloete<sup>4</sup>**

## CHEMISTRY

The clothes that we wear are made with synthetic material produced by chemical processes. The medications we use to cure diseases are the result of intensive chemical research. The paper on which we write is the result of a chemical process and the ink with which we write is a combination of several chemicals. Chemistry ensures the quality of everything we use in our everyday lives: the food that we eat, the air we inhale and even the water that we drink. Our bodies are complex combinations of chemicals. The efficiency of chemistry is indispensable for the processes involved in the way of living of all living organisms, as well as people.

Knowledge of chemistry is needed in several careers including agriculture, biology, dentistry, medical technology, nursing, pharmaceuticals and veterinary science. Graduates in chemistry are employed by a large number of technologically-based institutions. Laboratories in the private and public sector use scientific chemists in their research department and production lines. Industries provide job opportunities in several departments, for example research, production, quality control and marketing.

Chemistry and chemical processes play an important role in the winning of minerals in South Africa and also form the basis of the fuel-from-coal process, the gold, platinum, steel and other related industries, as well as the cosmetic and pharmaceutical industries. Managers in these industries need a good technical background in order to develop and manage the aspects of consumer, computer, engineering and pharmaceutical products. A comprehensive financial, economic

<sup>4</sup> The contributions and comments of the following people are gratefully acknowledged: Stroh, A, Kirsten, J, Malherbe, JB and Lubuma, J – Faculty Natural and Agricultural Sciences, University of Pretoria, Pretoria.

and industrial knowledge is indispensable. A career in industrial chemistry includes management skills, financial planning and consultation. Industrial scientific chemists are also able to manage their own enterprises.

## GEOLOGY

The growing world population needs increasing quantities of natural resources like minerals, building materials, water and energy to provide their basic needs. At the same time humanity must face natural threats like earthquakes, tsunamis and volcanic eruptions as well as the self-imposed problem of pollution.

Most earth scientists become geologists, economic geologists, geochemists, mineralogists, environmental geologists, engineering geologists and hydro-geologists.

Exploration geology has to do with locating scarce minerals – which are of economic importance – in mineable amounts. The geochemist does ground and rock surveys. Thereafter maps are drawn based on the collected samples. These maps indicate the concentration of metals and other elements. The geophysicist measures and charts the gravity, density, electric and magnetic characteristics as well as the radio activity of stones.

Mining geologists map, note down and collect geological data that are necessary for determining the value of the ore in a layer. Together with the mining engineer they monitor and predict the quality of the ore being mined. Laboratory specialists, like mineralogists, identify and examine minerals with the help of sophisticated machinery and analytical equipment. The environmental and engineering geologist studies the interaction between human activities and the geological environment, for example the pollution of soil and groundwater. They study the geological structure and soil characteristics at building sites, like dams, tunnels and mines, in order to make valuable information available before the building starts. Hydro-geologists are involved with the finding, mining and conservation of groundwater.

Mining companies provide geologists and other earth scientists with the most job opportunities. They can be involved in research, exploration and mining projects. Interesting careers can be followed at the Council for Geoscience, the CSIR, the Council for Mineral Technology, the Department of Water, museums, engineering firms and consulting companies. Geologists can also act as consultants in their own service.

## GEOGRAPHY

Geography is in the unique position of forming part of both the humanities and the natural sciences and therefore forms the link between the natural and human components of our environment. While Geomorphology, Biogeography, Climatology and Meteorology are the natural scientific components of this discipline, geographers in the humanities area try to solve problems of society, for example population booms and the deterioration and destruction of natural resources. Geography is a spatial science concerned with location and scattering of cities and human activities like agriculture and tourism. Processes, patterns, problems and possible answers associated with it are studied. Geography is also a planning and managing science aimed at improving people's quality of living. The Geography curriculum at the University of Pretoria places strong emphasis on geomorphology, environmental changes, urban development and land reform. With regard to research, the staff and postgraduate students focus on the impact of climate changes on the Antarctic and sub-Antarctic landscapes.

Geographers study the relationship and interaction between people and their environment. The talents and interests of the geographer determine in which area he or she will specialise, the nature of the problems that he or she will work with and that he or she finds solutions for. Careers for geographers can be divided into three main areas, namely education, research and the application of geographic knowledge and skills in practice.

Geographers can focus on environmental management, urban matters (for example informal settlements), country and rural development of environmental matters, like pollution and the eradication of ecosystems by activities like mining, agriculture and tourism. Geographers in the private sector usually work for firms in real estate, planning, agriculture, engineering, banks, tourist organisations, environmental protection agencies and development institutions.

Thanks to the holistic nature of geographers' training, they are suitable for policy-making and development of strategies on several management levels. Government departments responsible for water and forestry, land matters, tourism and education also employ geographers. Semi-government organisations like the SABS and CSIR provide career opportunities in specialised fields associated with earth and environmental sciences. Many geographers manage their own enterprises and are involved in marketing, planning, development, tourism, cartography, distance observation, environmental evaluation and analysis and environment auditing. Graduate geographers are also employed

increasingly in the development, maintenance and auditing of environmental management systems.

An academic career is another option for the geographer but a higher qualification like a masters or doctoral degree is necessary.

## GEO-INFORMATICS

The earth is a delicate planet with limited resources which are used by people more and more. The result is the deterioration of the natural environment and a decrease in biodiversity. In order to manage the environmental and social changes taking place and to ensure a good life for all, we need information to support our decisions on actions and policy with regard to the environment. The information that is needed is mostly of a geographical nature. We are looking for answers to basic questions like: What is it? Where is it? How big is it? What influence will it have on the surrounding nature? Geographical Information Sciences, or Geo-informatics, provide the tools, skills and information to answer these questions and more, about the physical and social environment of our planet. Geo-informatics provides us with information on how our actions can influence the environment in which we live and work, and how our environment can influence our welfare.

The following institutions provide well-paid career opportunities for the geo-informatics specialist: local authorities, government institutions, private companies, for example mining and security companies, banks and other private and utility companies like Eskom and Iscor that use geo-informatics in the following fields: agriculture, mineral exploration, engineering, forestry, water resource management, weather forecasting, environmental impact studies, land usage planning, land development, rural community development, transport planning, tourism, market research, crime prevention, vehicle tracking, disaster management and many more.

## METEOROLOGY

The weather and climate play a fundamental role in human lives because it influences daily activities like agriculture, sport, travelling and tourism. It even determines the survival of the human race. There is great anxiety about how the comings and goings of people is irreversibly changing the world's weather and climate. Meteorologists and atmospheric scientists take an interest in finding

out how the physics and dynamics of the atmosphere work. Weather forecasts on the short or long term are of cardinal importance. Nowadays these forecasts are created on a variety of time scales on huge super computers which solve the atmospheric equations. Air pollution is a growing source of anxiety. It is important that the atmosphere is kept clean of all unnatural gasses. The regular monitoring of air quality is therefore important.

Meteorologists are employed by several institutions involved in the studying, interpreting and prediction of weather and phenomena with regard to the climate. The South African Weather Service, the CSIR, some universities, agricultural institutions and the general industry employ meteorologists who mainly specialise in the following areas:

- Air pollution: With more industrial activity air pollution is becoming a growing problem. Monitoring of air control and the modelling of the impact of air pollution on societies are two important aspects touched on in this area.
- Atmospheric modelling: Currently super computers are used to solve complex dynamic flow equations. It creates the possibility for a better understanding of atmospheric processes and helps with weather forecasts.
- Weather forecasts: The central forecasting office of the Weather Service receives weather data from across the world. The weather forecaster must analyse this data and compile weather forecasts by making use of sophisticated numerical models.
- Research: Researchers research all aspects of the weather and climate in order to provide effective services and improve on them. Their findings are recognised worldwide.
- Climatologists: Climatologists manage important databases which contain large varieties of information gathered by the Weather Service and other institutions. They are also involved in climatologic research at universities, the South African Weather Service and research institutes that predict seasonal changes.
- Consultation: Some meteorologists, who work as consultants at universities and in the private sector, provide specialised research services.
- Education: At South African universities there are a few positions for meteorologists and climatologists. They ensure that the training of climatologists and meteorologists meet international standards.
- Management: Many meteorologists later end up in management positions at the South African Weather Service and other research institutions.

## PHYSICS

Physics involves the study of nature's laws. These principles form the basis of all basic sciences like astronomy, biology, chemistry and geology. Physics forms the basis of the applied sciences and engineering that has developed technology from the horse cart to the supersonic jet, from the candle to the laser beam, from smoke signals to the satellite transmitter. Although physicists are often researchers who analyse nature and related aspects, their creativity and resourcefulness also enable them to successfully occupy management positions on all levels of the industry.

Physics as a career covers a variety of specialised fields, for example acoustics, astronomy, astrophysics, medical physics, material science, geophysics and vacuum sciences. These fields offer a variety of positions, like laboratory supervisor, researcher, technician, teacher and manager. Physics provide job opportunities at government institutions, industries, schools and private organisations across the world. The following are a few examples of fields that physicists can specialise in:

- Industries: construction, food, chemical, space, engineering, agriculture, consumer ware, energy, fuel, metallurgy, semiconductors, textile and clothing, transport, computers, electricity, laser technology, materials, meteorology and financial modelling.
  - Basic research: universities, universities of technology, national laboratories, industrial and private laboratories.
  - Space and earth sciences: astronomy, space technology, geophysics, geology, atmospheric sciences, energy and resources, oceanography and marine sciences.
  - Engineering sciences: electronic, electric, biomedical, mechanical, metallurgic, computer, civil, chemical, instrumentation and environmental engineering.
  - Environmental sciences: sound control, pollution control, conservation, radiation protection and environmental monitoring.
  - Computer science: graphics, programme design, peripherals, modelling, artificial intelligence, data processing, computer games.
  - Medicine: radiation tumour theory, magnetic resonance, image shaping, nuclear medicine and diagnostic instrumentation.
  - Non-technical: law, administration, business world, journalism, museums, sport, accounting, marketing, art and scientific communication.
  - Publishing: technical books, journals and computer programs.
- Communication: telecommunication, television, video recording, photography and laser technology.
  - Consulting: industries, government and military.
  - Education: colleges, universities, universities of technology, high schools and primary schools.

# ENGINEERING SCIENCES

**Arnold Schoonwinkel**

Engineering provides an excellent career for people with creative thinking and good judgement who are willing to focus not only on the technological and business aspects, but also on people's needs. Engineers get job satisfaction from applying the natural sciences to create something useful for humanity. So if you are someone who wants to do something new every day and like to see how your ideas develop into something concrete and useful to people, then you will find engineering a very rewarding career.

Engineers create job opportunities and are therefore valued by their employers because they stand at the beginning of innovative processes and products which is the central to the success of any profit-maximising firm. This is why engineers often become entrepreneurs who establish and manage their own firms. The reason for this is because of the fact that they are systematic thinkers who can see the bigger picture and also have strong mathematical skills which are required to make accurate financial decisions.

## PERSONALITY AND CHARACTERISTICS OF AN ENGINEER

Many young people already know from an early age whether they are cut out for engineering. Others have certain characteristics and talents which indicate that they are eligible for a career in engineering.

It is interesting to look at the origin of the word "engineer" as explained in the internet dictionary Wikipedia: "The words 'engine' and 'engineer' (as well as 'ingenious') developed in parallel from the Latin root *ingeniosus*, meaning 'skilled'. An engineer is thus implied to be a clever, practical, designer".

The characteristics of engineers and young people with a strong potential for engineering are among others the following:

- Creative thinking
- Aimed at problem-solving
- Aptitude for mathematics and science
- A fascination with technology
- The ability to visualise objects
- A strong sense of responsibility to let their products and ideas work successfully for the benefit of people
- A preference to work in groups to do tasks
- Like challenges and are prepared to work hard to achieve their ideals.

Engineering typically doesn't only entail work in the small backrooms of a laboratory, but also involves the engineers working with a variety of people and in a variety of technological work terrains. Consequently this is a career for men and women who want to experience a technical as well as a social dimension in their work life.

## STUDYING ENGINEERING IN SOUTH AFRICA

In South Africa Engineering is a four year Bachelors degree programme (BEng, also known as BScEng) which equips students with a broad knowledge base. During the *first two years* a firm foundation is laid with mathematics and natural and engineering sciences. A lot of attention is also given to the basic engineering techniques which are frequently used in the analysis (understanding) of engineering systems. The first-year programmes of the different engineering disciplines have a variety of modules in common and at most universities students can switch from one engineering discipline to another at the end of the first year without having to catch up on too many modules. During the third and fourth year you learn to apply your knowledge (design and synthesis) in order to discover technical and business opportunities. With the broad knowledge base of a BEng degree you can work in a number of positions – within the field of engineering as well as outside is.

Under the Washington Accord, programmes accredited by the Engineering Council of South Africa (ECSA) are recognised in several countries in the world, including the United States of America, the United Kingdom, Canada, Australia and Hong Kong. The South African engineering faculties therefore design all their programmes in order to be accredited by ECSA. It places a

stamp of quality on the engineering programmes and ensures that graduate engineers can register as professional engineers after working for a few years.

Professional registration gives the engineering profession a certain status. It empowers you to deliver services as a professional consultant, and to occupy positions of trust in companies. It also gives your clients the assurance that you will act correctly and ethically in your provision of a service, because you submit to the high requirements of ECSA's professional code of ethics.

## ADMISSION REQUIREMENTS

Since engineering studies make use of a lot of mathematics and natural sciences and require further modules in these subjects, it is expected of learners to be well prepared with mathematics and science at higher grade level. Typically, engineering faculties will require of a matriculant to achieve at least 60% in mathematics as well as science in order to be accepted for studies at a faculty where professional engineers are trained.

*Admission usually requires a certain aggregate mark in the final matric exam as admission criteria*, and even requires minimum command of language. Interestingly enough, most engineering faculties do not require of learners to have had any subjects such as technical drawings or technology modules at school. The reason for this is that although that background is useful, all engineering programmes have one or more modules on technical drawing which edifies the techniques necessary for the different fields right from the start.

Learners are strongly advised to consult engineering faculties on their different admission requirements. That way the correct school subjects can be followed and learners can prepare themselves for sufficient achievement at school in order to gain admission to engineering studies. Students can, however, be assured that admission requirements have been determined accurately so that a learner who has been admitted according to these requirements and works hard will achieve his or her engineering degree.

## CAREER OPPORTUNITIES

South African universities have a few basic engineering fields that can be studied, plus quite a few varieties and combinations of these programmes. In the following sections the most common engineering fields are discussed.

### Industrial engineering

Industrial engineering focuses on people and technological systems with the aim of making enterprises efficient and thus more competitive. Graduates are responsible for the optimal design, implementation, operation, improvement and management of systems. These systems usually comprise people, equipment, information, capital, processes and procedures and industrial engineers improve the quality, productivity and cost-efficiency of these elements through optimisation. The industrial engineer is equipped for this by studying, among other subjects, mathematics, operations research, engineering economics, manufacturing processes and systems, ergonomics and production management. Apart from this technical content, industrial engineers are also involved with the people in the transformation process. These are the people that must realise and execute the activities and exercise control over the developed plans. Knowledge management is also important, because people and information are the most important resources in any enterprise.

Industrial engineers have a strong business focus supported by a technological basis, and can be found everywhere in the manufacturing and service industry, as well as in the business world.

### Chemical engineering

Chemical engineers are concerned with the manufacture of chemicals and the extraction of minerals on an industrial scale. They design, build and manage the plants in which physical, thermal or chemical processes change raw materials into products with a higher economic value. The development of new processes involving biotechnology is becoming more important.

The programmes in chemical engineering equip students with knowledge of mathematics, physics and chemistry as well as thermodynamics, transfer phenomena, separation processes, reactor design, biotechnology, process control, engineering management and cost estimation. The programme in mineral processing shares a common core with the general programme in chemical engineering, but focuses on the extraction of minerals such as gold, diamonds, iron, platinum and coal.

Chemical engineers work in a wide range of industries. These include the petrochemical industry, metallurgical plants, and plants for manufacturing fertiliser and cement, food industries, biotechnology and research laboratories. In South Africa most of the chemical engineers work in corporate companies (e.g. Sasol, Anglo, De Beers, Eskom, etc.), but an increasing number find

employment in new high technology companies, while the number of smaller companies offering employment to chemical engineers is also increasing.

### **Electrical and electronic engineering**

Electrical engineers are in the business of generating, transmitting, and converting electrical energy; electronic engineers, using electronic systems, gather, process and distribute information.

The BEng programme in Electrical and Electronic Engineering equips students with a broad knowledge base for a variety of career opportunities. The third and final years build on the base of mathematics and engineering sciences established during the first two years, with engineering applications in the fields of electrical energy, electronics, electromagnetic systems, computer systems, control systems and signal processing.

Electrical engineers are concerned with electrical energy applications in industries, such as the generation and distribution of electricity in factories, chemical plants, mines, municipalities, railways, and harbours. Electronic engineers are found in those industries where electronic information systems such as computers and computer networks, telephones, cell phone networks, television, satellite, radar and automatic aviation systems are used.

### **Computer engineering**

With computers increasingly becoming an integral part of electrical energy and electronic information systems, there is a need for electrical and electronic engineers with advanced capabilities in the field of *computer engineering*. These engineers must be able to devise and apply advanced computer and software system solutions to problems in the broad field of electrical and electronic engineering. Therefore, programmes in computer engineering include several modules on computer science and software engineering.

### **Mechanical engineering**

Mechanical engineers study, develop, and design a diversity of machines, plants, and products. They manage the manufacturing, maintenance and repair of machines and systems such as vehicles, aeroplanes, vessels, robots, food processing machines, power stations, agricultural machinery, and mining equipment. Sometimes a programme in mechanical engineering with special focus on aeronautical systems is presented as a separate degree programme.

### **Mechatronic engineering**

Mechatronic engineering is a combination of mechanical and electronic engineering. Mechatronic engineers develop and construct machines by making use of mechanical and electronic components, for example machine parts, sensors and actuators. These mechanisms are controlled by computer systems to create products and systems that are useful to humanity and society. A wide range of typical mechatronic systems are now being designed and developed, which may include anything from engine control modules to ABS braking systems in motor cars, automated assembly lines and artificial hearts.

South Africa follows international trends in the fast increasing demand for mechatronic engineers. Some mechatronic engineers work for some of the large multi-national corporations, such as De Beers, Anglo, Sasol, Denel and Eskom, but also for small consulting businesses.

### **Mining engineering**

Mining engineering is concerned with the development and working of mines as well as the extraction of minerals from ore. After a good foundation in mathematics, physics, chemistry and engineering science has been laid in the first two years, the programme builds on this during the third and fourth year with subjects such as geotechniques (that is the characteristics of geological formations), mining techniques and mine design. A lot of attention is also given to modules such as project management, environmental engineering and engineering management. They often act as programme or project managers for big projects for example the designing and building of mine shafts.

Mining engineers do very responsible work and often reach management positions thanks to their broad training. Typical employers in South Africa are in the sectors of gold, platinum, coal and minerals both from land and the ocean floor.

### **Civil engineering**

Civil engineers are involved in the design, construction, and maintenance of infrastructure such as water supply systems, airports, roads, bridges, harbours, tunnels, dams and structures for residential, commercial and industrial applications.

Following on the sound foundation in mathematics, physics, chemistry, and the engineering sciences that is laid in the first two years, the third and fourth

years of the programme cover subjects such as water engineering, structural engineering, transportation and geotechnical engineering. The subjects environmental engineering and engineering management give the student a wide frame of reference. In informatics, the use of computers is developed as a powerful aid in solving a diversity of problems.

Civil engineers fill numerous and varied positions in the public and private sectors, from local authorities to government departments, and from consulting firms to giant international construction firms.

# HEALTH SCIENCES

Wynand van der Merwe

At one or another time, each of us has been ill and has visited a doctor and other health workers. Medicine is one of the oldest professions and originated in the earliest times in Egypt and Greece. It soon spread worldwide and today, thanks to research that has been done through the ages and has been based on scientific testimony and facts, medicine and the other health occupations are highly specialised and evidence-based occupations.

“Health sciences” is a comprehensive term which includes all professional occupations that play a role in the maintaining of health, prevention of illnesses, diagnosis and treatment of illnesses and rehabilitation in the process of recovery. The occupations that can be included are therefore those of doctors, dentists, nurses, pharmacists, clinical psychologists, physiotherapists, occupational therapists, dieticians, speech therapists and audiologists.

On receiving a degree in any of the health occupations and when entering the occupations, each of the graduates commit themselves to a code of conduct or professional oath (in the case of Medicine it is a modern version of the centuries-old Hippocratic oath), in which service to fellow people through the promotion and maintaining of welfare and health and through the conscientious carrying out of the occupation in all its facets is spelled out. All the health occupations are also subject to a strict occupational code and each graduate must register at a national occupational council in order to be able to practise the occupation in South Africa.

## **THE PERSONALITY AND CHARACTERISTICS OF A PERSON CONSIDERING A CAREER IN THE HEALTH SCIENCES**

One should be very careful not to make a career choice based on the romanticising of the profession (as often portrayed in television series and movies); because a parent or family member is in the profession; or last but not least, because you expect to earn a big salary in that profession. Firstly it is therefore important to know exactly what the specific job entails, as well as to be aware of its good and bad components. Talk to people who practise the profession and ask probing questions about the positive as well as the negative aspects of such a career. If possible, “shadow” someone in the profession for one or more days, so you’ll get a firsthand idea of what is possibly in store for you.

Something else that might help you in your decision is to get an idea of the characteristics necessary for a person in order to be successful in the health sciences and to enjoy it. These characteristics include the following:

- An empathic attitude toward people and communities;
- Readiness for unselfish service and involvement in a community;
- The ability to think scientifically, logically and solve problems;
- The ability to work in a team and be subservient;
- Good social skills;
- A philosophy of life which makes it easy to function within strong ethic guidelines and norms;
- Diligence and the willingness to work irregular hours;
- A strong sense of responsibility;
- The ability to function in very stressful situations;
- The talent to apply self-discipline

## **ADMISSION REQUIREMENTS**

Since the health sciences in broad are seen as a field in the applied natural sciences, it is understandable that a scientific foundation at school is necessary in order to successfully study one of the health sciences. It is also reflected in the requirements with regard to which subjects the school leaver must take in grade 12 in order to be considered for one of the programmes in the health sciences. Often a certain minimum achievement in the science subject(s) at

school is required and a mere pass is not satisfactory. Currently one or more of the subjects Biology, Mathematics or Science are required matric subjects for nearly all programmes in the health sciences in South Africa.

The minimum achievements required of individuals in these subjects differ depending on the specific course/programme and there sometimes are differences between different universities (even for the same course/programme). It is therefore necessary for learners to study the information on the different universities’ websites, or to contact the administrative departments of the university directly in order to find out exactly what the required subjects are, as well as the minimum achievements necessary in these subjects in order to apply for a specific programme in the health sciences. If by grade 9 you already know what profession you want to work in, it would be ideal that you already find out the information at that time so that you can choose the correct subjects for grade 10 to 12.

With the change of school curricula to the current National Senior Certificate (NSC) system, all universities are busy adapting their admission requirements with regard to compulsory subjects (and achievements in these subjects) for the first school leavers within the current NSC curricula who will apply to universities in 2009. For learners within the new curriculum it is even more important to contact universities of their choice in advance to find out what the new requirements will be.

Due to the fact that only a limited number of students are admitted to nearly all courses in the health sciences, only a limited number of students are admitted to these programmes at each university. The students who are admitted are appointed through a selection process. This implies that you won’t necessarily be admitted to the programme that you apply for, even if you meet the admittance requirements.

Different universities have different selection processes, but the academic achievement of applicants is a determining factor throughout the selection process. In many selection programmes the non-academic merit factors are taken into account along with the academic achievements. In order to position yourself as well as possible in order to be selected for the subject field of your choice at the university of your choice, it is once again important that you find out in advance from the university/universities what exactly the factors/criteria are that are taken into account during the selection process.

## UNDERGRADUATE PROGRAMMES IN THE HEALTH SCIENCES

### Pharmaceutics

Pharmacists are important participants in the health care chain and in the process of therapy/treatment of illnesses by the administering of medicines. The pharmacist is usually the person responsible for the providing of medicines which have been prescribed by the doctor or pharmacist. Although pharmacists aren't qualified to prescribe certain medicines, they are very capable of advising patients on these medications and their usage, as well as give advice on what the correct counter medicines (medicines that you don't need a prescription for) are for general illnesses. They also advise doctors on the correct dosage and possible negative side-effects of medicines. Most qualified pharmacists find a career in the pharmacies of hospitals or other healthcare facilities, or in private pharmacies in the community. In the latter cases the pharmacist is often also the owner and manager of the pharmacy, although these pharmacies are increasingly owned by pharmaceutical chains or even store groups.

A four year Bachelors degree in Pharmaceutics (BPharm) is offered at nine universities in South Africa. Since pharmaceutics is the occupation which forms the link between the health sciences and the chemical sciences the subject or module content of the training programme is a combination of these two sciences with subjects like Organic Chemistry and Inorganic Chemistry, Biochemistry for Health Sciences, Pharmaceutics and Pharmacology which form an important part of the programme. Details in this regard are readily available on the websites of the different universities.

### Occupational Therapy

Occupational Therapy involves the rehabilitation of people who are physically or mentally disabled, either acutely or chronically. Its aim is to help to lead the person/patient back from the illness or disability to mainstream society where he or she can once again make a normal or at least a productive contribution and lead a full life.

It typically entails actions like the evaluation of a person's different work abilities and advice and therapy to develop such abilities; advice and training in the use of apparatus which make work and even normal actions and tasks

possible and easier; purpose-driven treatment programmes in order to carry out daily activities; advice and support for family or caregivers; and much more.

In South Africa, the training of an occupational therapist consists of a four year Bachelors degree programme. The first year of study mainly consists of modules which provide the scientific basis for the ensuing theoretical and practical training in the professional field. The practical training takes place over a wide platform which includes hospitals, clinics, schools (also for the disabled), old age homes and work centres. On completion of study the qualified occupational therapist must do one year of community service, with compensation, somewhere in South Africa. Thereafter he or she is a fully independent therapist who can practise his or her occupation either in the public or the private sector.

### Dietetics

The dietician looks after the nutritional state of a patient, but often also looks after the preservation of nutritional health in communities and other groups such as sport teams and athletes. On completion of studies dieticians can work in different fields. The most common is probably *clinical dietetics*, where the dietician works as part of a health team and plans medical feeding schemes which are suitable for the different state of diseases of patients in hospitals. *Food service managers or dieticians* plan and manage food services in large institutions like hospitals, schools, restaurants, et cetera. Their responsibilities include the coordinating and management of the supply, preparation and serving of food and the staff members involved. Community dieticians provide services to the broader community, sometimes including clinical dietetic help to patients at their homes. Otherwise they also transfer their knowledge and plan and coordinate feeding programmes for large organisations like schools and other organisations in the public sector.

In South Africa a person can qualify and register as dietician by following one of two routes. The first is a four year Bachelors degree of which the first part strongly focuses on the basic sciences underlying to the discipline, while the more dietetic subject content follows in the senior years of the course. The other option is to first obtain a general BSc degree and then do a Masters degree in Dietetics. Different universities offer different options in this regard.

After qualifying and obtaining a degree in dietetics, dieticians must do a year of community service in South Africa. The sub-subject fields ensure that it is an occupation with a variety of career opportunities in the public as well as the private sector.

## **Physiotherapy**

A physiotherapist provides services that promotes health, prevents illnesses, are therapeutic or rehabilitating. The therapeutic and rehabilitating interventions are largely aimed at achieving the normal functioning and movement of patients with illnesses or injuries that affect the cardio-respiratory, neurological and musculoskeletal system. Although the physiotherapist often works in a team along with the doctor, he or she generally functions independently, which means that he or she fulfils a diagnostic as well as therapeutic role. The therapeutic regime often includes, except for mobilisation and manipulation techniques, the prescription of advice on the use of supporting technology and apparatus. The mobilisation and manipulation techniques sometimes make use of electrophysical modalities like heat therapy, electrotherapy and cryotherapy.

The undergraduate programme in Physiotherapy is also a Bachelors qualification (usually a BSc) over a period of four years. Like the other above mentioned professional programmes, it has a strong basic scientific component, mainly during the first year, followed by the subject and occupation-related theoretical and practical training. Completion of the degree is followed by a year of community service after which the physiotherapist can practise independently in South Africa. Besides a career in a hospital or other health facility in the private or public sector, physiotherapy services can also be provided to other institutions like schools, old age homes and sport teams and clinics. It is therefore realistic to expect a diverse and exciting professional career.

## **Medicine**

Becoming a medical doctor is a dream that many young learners have. Often this dream is based on a romanticising of the career without an understanding of its demanding nature. Despite the demands it is still a career which can provide a lot of job satisfaction to a person who has the right temperament, attitude and commitment.

A present-day medical doctor's practice focuses strongly on a so-called holistic approach which places emphasis on the handling of patients, on all facets of the prevention of illnesses, preservation of health, healing of illnesses and rehabilitation. The largest part of most doctors' practices still consists of the diagnosis and treatment of illnesses. The two most important and most common treatment modalities are the administering of appropriate medication or the execution of surgical procedures or both.

As with most other professions the explosion in new scientific knowledge and technological development has drastically changed the physician's practice during the last century. Although the taking down of a thorough history of illnesses and the carrying out of a just and equally thorough physical examination is still the most important part in making a diagnosis, the accuracy of difficult diagnoses are now a lot easier thanks to a series of biochemical tests which can be done on bodily excretions, blood and organs as well as sophisticated x-ray and image modalities. Treatment methods and techniques have undergone revolutionary changes in the past few decades. The knowledge of human physiology and anomalies during illness has developed dramatically. Along with a growing knowledge of biochemical manipulation of physiological and pate physiological processes led to the development of new medications with which illnesses can be treated much more successfully, without too many unwanted side-effects. Surgical procedures have also changed notably, especially thanks to the development of endoscopic apparatus which make it possible to do operations through a "telescope" in body cavities and wounds without making big and drastic operation cuts and wounds which lead to bigger tissue damage and need more recovery time.

In South Africa there are eight universities who train medical students to qualify with a MBChB degree (Bachelors of Medicine and Bachelors of Surgery). At three of the universities the duration of the programme is five years, and at the other five it is six years. The University of Witwatersrand also offers a four year programme for students who already have a BSc degree. All the programmes have a strong foundation of the basic health sciences, along with all the clinical health sciences (which among others include Family Doctoring, Internal Medicine, Paediatrics and Child Health, Psychiatry, Obstetrics and Gynaecology, Narcoses, Orthopaedics and all the surgical subjects).

On completion of the degree the graduate does a two year internship where the application of knowledge and the further development of clinical skills take place. Thereafter follows a further year of community service, as is the case with all the other health professions. The internship and community service take place in hospitals and other institutions in the public sector and the young doctor does earn a salary during the three years. Only after completion of this phase can the doctor practise independently in the public or private sector. In order to specialise in one of the fields of medicine, a further period of in-service training is necessary (see below).

## **Speech, Language and Hearing Therapy**

The speech, language and hearing therapist is a key person on the terrain of prevention, diagnosis, treatment and rehabilitation of a wide variety of pathology of communication and communication abilities. This includes the full extent of speech, language, and hearing, fluency, feeding and swallowing deficiencies which form part of the professional field.

Hearing therapy includes a variety of treatment options for disabled people, including hearing apparatus and strategies to promote functional communication. Speech and Language Therapy includes the handling of speech deviations (like stuttering and other pathology), language (which includes language phonology, syntax, et cetera) including the comprehension and conveying of language in conversations, written and other forms. Neurological reasons for language deficiencies in children (for example cerebral palsy cases) and older people (for example after a stroke) form an important part of the therapist's patients. The internet dictionary Wikipedia provides a comprehensive explanation of a speech, language and hearing therapist's spectrum of practice and professional activities.

The speech, language and hearing therapist's training also entails a four year Bachelors degree programme. Although the basic scientific foundation of the course includes elements of the natural sciences, it also includes modules like General Linguistics and Psychology, which provide an important foundation of skills for the communication and language deficiencies that form part of the professional subject field. Clinical and practical training is not restricted to hospitals, but mostly take place in clinics, schools (for normal and disabled children), rehabilitation centres and old age homes. It is also in these institutions where the qualified therapist later finds career opportunities.

## **Dentistry**

Dentists are practitioners who are responsible for the prevention, diagnosis and treatment of diseases in the mouth cavity (of which the teeth form the most important part of their practice), as well as the other structures of the so-called maxillary facial part of the face. As in Medicine the most common functions are those of diagnosis and treatment. Dentists also readily make use of dental technicians and mouth hygienists to help and support them in especially the treatment methods they use.

Dentists who do not undergo further training in one of the dental specialist areas still have the benefit that they can make diagnoses and give treatment that

is relevant to the specialist areas (but only if they have adequate experience). Their practice therefore often entails a spectrum of therapy which includes teeth extractions, repair work (the "filling" of teeth), teeth bridge work, dentures ("artificial teeth"), root canal therapy, treatment of gum diseases, and even the "straightening" of teeth (orthodontics) and implanting of (artificial) teeth in the jaw.

The training of dentists in South Africa consists of a five year Bachelors degree of which the basic section on health sciences corresponds greatly to that of Medicine. The clinical/practical training takes place in dentistry hospitals, clinics and practices. An inherent "dexterity" is a very good attribute for a prospective dentist, since the finer technical work forms an important part of a dentist's therapeutic work. Graduate dentists must also complete a year of (paid) community service in the public sector before they can start working as independent practitioners.

## **Nursing**

It is probably apt to describe Nursing (and therefore nurses) as the backbone of the health services in South Africa and elsewhere in the world. Nurses form an essential part of the health team and are key players – sometimes independent, but usually in a team – in the processes of prevention of diseases (just think about their responsibility in the maintaining of sterility in hospitals, their leading roles in vaccination programmes, et cetera), the care for and treatment of sick people in their initial process of healing and recuperating, as well as through support, accompaniment and advice on long term rehabilitation where necessary. They fulfil these functions in health facilities ranging from the most sophisticated tertiary hospitals to the humblest of primary care clinics in remote rural towns.

Often, especially in primary health facilities in communities, nurses also play an important role in the management of the services and facilities. Nurses in specialist fields which require special knowledge and experiences, are a worldwide tendency in fields like intensive care units, operation theatres, obstetrics wards (where normal and complicated births and caesareans are performed), psychiatric wards/hospitals and oncology clinics and wards (where patients receive radiation, chemotherapy and other treatments for cancer). These nurses receive additional training in the specialist field after receiving their initial training, and often receive a postgraduate or post-basic diploma.

Nursing, which enables a person to register at the South African Council of Nurses as a "registered nurse", can follow one of two routes. The first is a

Bachelors degree (BCur or BTech) at a university or a Diploma in Nursing at a nursing college. Both these training programmes stretch over four years.

## POSTGRADUATE PROGRAMMES

In all the health sciences there are postgraduate programmes where you can either become better qualified in your main subject, or specialise in a discipline (or subsection) of a main subject. In Medicine and Dentistry specialisation also enable you to register as specialist at a professional council and have a career in the specialist field. This type of specialist training usually stretches over four or five years, depending on the subject field.

Naturally postgraduate studies also open up to the door to another career option, namely to join the university as academic and/or researcher in that particular health science.

Medicine can be a very exciting and rewarding job. However, it also requires sacrifices. Ensure that you are truly suited for the job, because only then will you enjoy it. Good luck with your decision!

# LAW

## Marinus Wiechers

Talk with most people and they think that law only entails a well-spoken advocate's dramatic defence of a poor accused, as seen on TV or read about in sensation articles. These types of cases, the criminal cases, only form a small part of the total judicature. The area of jurisprudence stretches a lot wider, from private cases like marriages, contracts, wills and testation and much more, to public affairs such as constitutional issues, protection of human rights, transfer of property and other legal and administrative actions of the government. Add to that a huge amount of specialised areas such as company cases, the workings of banks and insurance companies as well as wage and labour arrangements, patents and trademarks. Jurists must also know how criminal and civil cases (cases between parties where the government and official institutions are not involved) should be tried in court. For this they need knowledge of formal law, which means criminal procedure, civil procedure and furnishing of proof.

## THE LAW IN SOUTH AFRICA

You can easily say today that every single aspect of a person's existence and activities is regulated by the law. It is quite understandable since our whole political system is founded in our Constitution and general rule of law. South Africa is therefore called a law state.

Characteristic of a law state is the extensive network of rules and instructions which determine all our relationships with other people as well as our relationships with the government and its officials. Conversely the government is also controlled by the law. Therefore the government and its officials may not act at will. They are also tied to certain set rules of law. With the application of rules of law with regard to the equalising of different interests and the judging of all kinds of human relationships, it is understandable that many disputes and uncertainties will arise. It is therefore the task of the jurist to solve such disputes and uncertainties either through deliberation and settlements or in court.

The South African legal system has a long history. Although today our law is mainly found in laws (of which the Constitution is the most important), ordinances and thousands of regulations, there is also a large part known as common law. This part of our law originates from the earliest prehistory of the Roman and Dutch legal systems. The English law has also influenced our common law. Because indigenous law – the traditional law of tribes – must also be acknowledged and applied as long as it doesn't clash with the Constitution and laws, this law must also be studied.

## PERSONALITY AND CHARACTERISTICS OF A JURIST

To be a good and successful jurist requires a number of abilities, for example the *ability to work very hard* and be *honest* and *virtuous*, the ability to *think perspicaciously, quickly and analytically*, to have a sharpened memory and to be able to quickly separate the wheat from the chaff. Natural intelligence will also help a lot.

It is often thought that jurists should have the gift of the gab and nobody will deny that good debating and reciting abilities are an asset. There is however not a stereotype jurist. Because the law has so many facets, there is room for the most variegated personalities, from a gentle introvert who doesn't like the pressure of court work and prefer commercial negotiations or administrating estates, to the extrovert who wants to show his or her spectacular personality in court and public proceedings.

There are two characteristics that successful jurists should have. If they don't yet have these characteristics, it must be learnt and developed. The first characteristic is *language and writing skills*. Nearly all court proceedings are done in writing, in the form of pleas, arguments, sentences, applications, rendering of testimonies, opinions, contracts, will, acts, motions, appeals, discussions and articles. And I'm not even talking about the huge amount of correspondence with clients, government departments, legal officials and opponents during cases. People who struggle to express themselves clearly and correctly in word and in writing, will struggle as jurists and their practices will suffer, because poor use of words and clumsy, inaccurate phrases in contracts and wills often become disputed points in drawn-out court proceedings.

A knowledge and understanding of one or more of the other official languages are a further bonus, because these languages are often used by witnesses and have to be translated by interpreters into Afrikaans or English. The jurist who also understands these languages, will know immediately if the interpreter

has relayed the correct meaning. For jurists who later want to specialise in the comparative law or international law, knowledge of other main languages of the world, besides English, will be a further plus point.

Because legal work consists of a lot of paperwork, language and writing skills must be further supported by the ability to read quickly and accurately. A jurist who reads with his or her finger, mumbling and slowly, will never be able to get through his or her work.

The second important characteristic of a successful jurist is *a good general knowledge and understanding of national affairs, the economy, agriculture or any other aspect of society*. Probably even more important is a good knowledge of human nature, in order to understand why people do what they do, why people take on enterprises, why some people break the rules of law, why some people cheat and slander others, why some people lie. A good dose of curiosity in order to understand people and judge their actions will therefore prevent legal work from becoming a never-ending drag. Someone who constantly spends his or her life as jurist in isolation with laws and paperwork will later become very frustrated. Even the conveyancer who doesn't like fighting in court, must understand why people enter into contracts to obtain or sell property. Unfortunately it is true that legal work often consists of the solving of people's problems and disputes. Therefore a jurist should know how to handle conflict as well as his or her own stress levels.

## CAREER OPPORTUNITIES

Because the law controls so many terrains of life and human activities, the career opportunities for a jurist are nearly unlimited.

*Judges, magistrates, prosecutors, advocates and lawyers* are probably the first group of trained jurists which come to mind when thinking about a career in law. These trained people all form part of the formal law profession. There are, however, numerous other career opportunities, like becoming a *lecturer* at a university or college, a *member of a management team* or *legal adviser* of a bank, financial institution or company, or a *legal expert, legal draftsman* or *expert on international treaties*, which all have possibilities of careers in public administration. Today everywhere in education, the financial world and in the widespread government it is indispensable to have people with legal expertise. Even for somebody who one day wants to become involved in politics, legal expertise will definitely be an asset, because the government in all its forms is concerned with the making, issuing and application of the law. Of course active

politics is mainly concerned with the drafting, propagating and following out of politic policies, but the following out and applying of political policy must still be allowed by the law.

Legal qualifications provide an enormous amount of career opportunities. It is therefore understandable that during the course of their legal training universities also provide for different opportunities of specialisation. Besides certain compulsory, basic subjects in the Private and Public Law, for example Law of Persons and Family Law, Law of Contracts and Law of Delict in the Private Law and Constitutional Law and International Law and Administrative Law in the Public Law, they offer a number of choices in specialisation areas, for example Insurance Law, Bank Law and Labour Law. Naturally it can't be expected of beginner students to know from the start in which area they want to specialise. It is, however, important to find out which speciality courses are offered at the different universities, since this knowledge can be important in deciding which university to choose for legal training.

## PRACTICAL ADVICE

### What is good practical advice for someone considering choosing law as a career?

Firstly you must ensure that your language and word skills are strengthened and expanded. Read, write, compose and talk in public, in debates and discourse of clubs, societies and meetings. Learn to compile minutes and reports. If you read slowly, you must learn to read expertly and quickly.

Secondly you must strengthen and expand your general knowledge. Be interested in national affairs, politics, the economy and all kinds of social issues. Talk as much as possible to people in legal occupations in order to hear about their experiences and opinions. That way you will expand your knowledge of human nature and deal with people. Try to attend court sittings. Ask advocates and lawyers to explain what is happening in court, since when first experiencing a court sitting with all the formalities and procedures, it can be quite unintelligible. Be careful when somebody tries to convince you that law is actually a job for men. Long ago people used to think that. Nowadays everybody will agree that there are many very successful women in all the different legal professions.

# SPORT SCIENCES

Tim Noakes<sup>5</sup>

Sport science is an emerging discipline which applies scientific principles to understand factors associated with sporting performance or health. The origin of sport science can be traced to human physiology laboratories mainly in Europe about 90 years ago. The main focus of research was to quantify energy expenditure and oxygen consumption in an attempt to explain fatigue associated with exercise. In the 1960's biochemists applied their skills to exercise and much progress was made in understanding metabolism during exercise – this had important applications in health and performance. In the 1970's the scientists working at the mines in South Africa made important contributions to understanding work physiology and adaptation to exercise in the heat. Many of these findings have been translated to sport and have formed the basis of much of the knowledge in this area.

As the discipline of sports science evolved, scientists with training in psychology, nutrition, biomechanics, molecular biology, genetics, and immunology have applied their specialised skills to exercise and sport with the goal of improving performance, reducing the risk of injury or promoting health. It is accurate to say that now every established science discipline has some application to exercise, and sport science has contributed to the body of knowledge which has accumulated. Indeed the top exercise scientists around the world represent a group who have had diverse undergraduate training in their formative years. Much of the accepted knowledge around sports performance and health has at some stage been subjected to the scientific process and tested in controlled experimental trials, and published in peer-reviewed journals which are circulated globally. The questions are endless and each good experimental study probably creates more questions than it provides answers.

<sup>5</sup> The valuable contributions of Wayne Viljoen and Mike Lambert are gratefully acknowledged.

## ROUTES TO A PROFESSION IN THE SPORT SCIENCES

Students attracted to sport science should have an enquiring mind, be excited about determining “cause and effect” relationships and have an interest in sport, exercise and health. To be eligible for postgraduate training in exercise science a student needs to have a BSc degree specialising in one of the biological sciences.

The first step in training is to acquire an honours degree which takes one year. This level of training will equip a student to either:

- work in a laboratory as a research technician;
- teach in a school;
- teach at a university (junior lecturer level); or
- work in the commercial marketplace with a company that is involved in the business of health and fitness.

The next step in training in sports science is to earn an MSc or PhD degree. An MSc degree takes two to three years to complete. It is arguable, but the job opportunities for a student with an MSc degree are probably quite similar to the opportunities for a student with an honours degree. A PhD degree takes three to five years to complete. This training ensures that the student becomes specialised and it is often this specialisation which creates an opening into a fulfilling job. The scope of work opportunities increase significantly with a PhD degree. Many talented PhD graduates spend a few years in a postdoctoral position during which they are able to concentrate on their research activities, before filling a more permanent position in an academic institution. A candidate with a PhD degree who has published his/her research in peer-reviewed international journals will be competitive in applying for an academic career at a tertiary institution either locally or abroad. In an academic position a typical job profile involves teaching, research, raising research funds, consulting and administration.

A popular focus within the sport sciences is to become a biokineticist. We shall consequently consider this focus in more detail.

To study biokinetics, one first has to complete an appropriate undergraduate (BSc/BA/BComm/B) degree specialising in Human Movement Science, which is the only route accessible to prospective biokinetics students. Without the Human Movement Science major, you will not be accepted into the biokinetics course. After successful completion of the Human Movement Science degree, students are then eligible to apply for the Honours degree in biokinetics at

the universities that offer this course. The selection criteria at the respective universities are quite stringent, and limited positions are available.

Ideally, when studying for this career option, it is highly recommended that one is hardworking and diligent in one’s studies as an undergraduate student, and that one aims for a first class pass. This will significantly improve your chances for selection. As stipulated by the HPCSA, after completion of the Honours degree in Biokinetics, students must undergo a compulsory one-year period of supervised professional internship with an HPCSA accredited biokineticist or medical doctor. The professional internship must be completed before being able to register at the Professional Board for Physiotherapy, Podiatry and Biokinetics (at the HPCSA) and practice as a biokineticist. To be a successful biokineticist one needs to be a very hard-working individual who gets along well with people, has good reasoning ability, and has great patient handling and communication skills. On top of this good time management, planning, administration and networking skills are important assets to be successful as a biokineticist.

## BECOMING A BIOKINETICIST

The profession of biokinetics has three main focus areas, namely health promotion, prevention of disease and/or injury, and rehabilitation of disease and/or injury. The first two areas are unique to the biokinetics profession and are what differentiates biokinetics from other medical disciplines. A biokineticist is a third-line clinical practitioner registered at the Health Professionals Council of South Africa (HPCSA) and is involved in the field of specialised exercise therapy for the improvement of quality of life and day-to-day physical functioning. Physical activity is the biokineticist’s primary form of treatment.

People who are frequently treated by biokineticists have one or a combination of a number of conditions. *Orthopaedic conditions*, for example, are characterised by neurological/neuromuscular injury or disease, arthritis, osteoporosis, lower back pain, and/or orthopaedic injuries of the foot and ankle, knee, hip, pelvis and thigh, spine, shoulder, elbow, forearm and wrist. *Chronic diseases of lifestyle* again are characterised by type I or II diabetes, high blood pressure, obesity or overweight, metabolic syndrome, high blood fats, coronary artery disease, heart disease and/or peripheral vascular disease. Other conditions include lung disease, fibromyalgia and renal disease.

A significantly large portion of the work of a biokineticist has to do with preventative medicine. Screening, exercise testing and evaluation of “apparently healthy” individuals forms an integral part of disease prevention. A biokineticist is regularly involved in the health screening of sedentary individuals who appear to be healthy (i.e. individuals with no visible signs of disease). This functions as a preventative measure to identify and reduce any possible underlying risk factors for disease, thereby improving their health status and preventing the development of disease and/or injury. This screening process also incorporates people who wish to become fitter or get in shape. This screening and physical assessment procedure is also used to guide an appropriate and evidence-based exercise prescription.

The field of exercise therapy utilised by biokineticists extends from the very young to the very old, in an attempt to improve people’s quality of life and health status in general. A biokineticist usually works in conjunction with numerous medical professionals to provide the client/patient with the best possible chance of recovery or treatment. In the clinical setting biokineticists usually receive their patients through referrals from medical specialists such as orthopaedic surgeons and cardiologists, and also from other medical professionals like general practitioners, physiotherapists and occupational therapists. The biokineticist’s role is to provide final phase rehabilitation exercise programs for these clients/patients to bring them as close as possible to their optimum functional status, either within the sporting environment or within their activities of daily living whichever is applicable.

An additional sub-focus of a biokineticist is high performance testing, evaluation, and exercise prescription for sports performance enhancement. A large part of high performance testing, which is crucial to the role of a biokineticist, is directed at identifying correct or incorrect training techniques, screening for biomechanical abnormalities, developing optimal sports conditioning programs and individual injury prevention and/or treatment. Also, an in-depth understanding of sports conditioning/programming is required to assess and appropriately prescribe related final phase rehabilitation and return to play exercise progressions.

## CAREER OPPORTUNITIES

Career opportunities for a biokineticist mainly include the following:

- Setting up a private biokinetics practice
- Employed as a biokineticist for a professional/club sport team
- A VASA biokineticist at the Virgin Active gymnasiums
- A biokineticist within a private multi-disciplinary practice environment e.g. doctor, physiotherapist, biokineticist, massage therapist, etc.
- A biokinetics practitioner within a hospital environment – either private or employed by the hospital
- A biokinetics practitioner within the corporate business sector e.g. Eskom, Telkom, Virgin Life Care – usually employed or contracted by the business
- A biokinetics practitioner within the school sector, to look after the health and well-being of the learners, staff and sports teams – usually employed by the school (where available)
- Employed by the universities as a researcher, academic or biokinetics practitioner
- Assessor for certain medical aid service providers
- Working as an employee of another biokinetics practitioner

# SELF-MOTIVATION - THE KEY TO SUCCESS IN STUDY AND IN LIFE

## Charl Cilliers

*The title of this chapter may sound logical. You may also have heard it so often that you find it irritating and therefore even ignore it. This is understandable, but I have a few thoughts for you that may prevent you from becoming part of the following statistic:*

**More than 50% of first-year students at our universities do not pass their first year the first time round.**

(ie: do not pass 100% of their modules (subjects) in their first year)

Now you're interested! Apologies for the negative tone to get your attention – but I'm desperate to support you in being a successful student and, ultimately, in being successful as you enter the workplace and as an achiever in life.

Here then are some short, positive thoughts:

1. People are not necessarily born with self-motivation. As with all skills, it is a life skill that must and can be developed and improved.
2. Self-motivation is the key that switches on your unbelievable brain potential. Because you are reading this and are planning to study further

(or are already studying), you clearly have relatively unlimited capacity. Just make sure that you know how to unlock it!

3. Below are some tips that I have picked up after years of experience with learners and students; they may be of value to you. I call them the 7-6-5 approach (there are 18 tips in all).

I will first explain the 7-6-5 approach in short and then discuss each tip separately.

The word 'motivation' is derived from the Latin word *movere*, which means 'movement'. The question is therefore this: how do you reach 'movement' in your studies and in your life? The 7-6-5 approach summarises the core of the answer to this question:

- With regard to the 7 of the approach, I have discovered that academic and life achievers generally have 7 characteristics in common, characteristics that are confirmed in achievers internationally (Botha & Cilliers, 2003). These characteristics include a clear vision of what they want to achieve in their lives (over the short, medium and long terms), the evaluation and alignment of all their current actions and plans in the light of this vision, and a consistent and continuous focus and accompanying self-discipline and perseverance to realise this vision. These achievers have also learned that the above depends heavily on a positive attitude and, in particular, on hard work. Think of the role models in your life. I am sure that you will agree that these 7 characteristics are largely true of them as well.
- With regard to the 6 of the approach, true achievers are also balanced people. They have learned to live and apply the 7 characteristics mentioned above widely. Internationally, balanced people are described as those who continuously try to live these 7 characteristics in at least 6 dimensions (living according to the so-called well-being approach): the social, emotional, intellectual, career, spiritual and physical dimensions (Krivoski & Warner, 1986 ; Meyers, 1991 & 1992).
- My own research (Cilliers, 2001) also clearly shows that students who continuously strive to live the 7 'characteristics of success' widely and in at least 6 dimensions of well-being are mostly both academic and life achievers. Think again of your role models in this respect: are there more conclusions for you to draw?
- You may agree with everything that I have mentioned so far but you may also feel powerless to make all this come true in your own case. Well, the 5 of the approach, which I will discuss later, explains how to do this. It's an extra incentive to self-motivation – so read on!

## The 7 of the approach

**Tips 1 to 7:** Self-motivation means that you have the key to and that you are the driver of your own success, something that I have already mentioned. It all starts and ends with you. You may have read Stephen Covey's book *The seven habits of highly effective people* (1994). This contains an important message: successful people have learned that "private victories" are a prerequisite to "public victories". In other words, you first have to conquer yourself (and do so continuously) before you can conquer something outside yourself (such as academic success).

The following are 7 "private victories":

- Having a clear reason for your choice of study. Are you absolutely sure that the programme that you are following is the right one for you? If not, make an appointment with a recognised vocational guidance counsellor or psychologist immediately.
- Knowing what you ultimately want to do or achieve with your degree. What is your vision for your career? Remember the saying "He [or she!] who aims nowhere, gets there!"

If you can answer the two questions above honestly, clearly and positively, the next 5 "private victories" will follow so much more easily:

- Focus: now you know what to focus on,
- you know why self-discipline is so necessary and
- you know why you should persevere, even when you experience (temporary) setbacks and/or problems.
- The above will, of course, contribute largely to but still depend continuously on your own positive attitude but
- remember action is the crux of the matter and the key to success. Without this, all the above are useless.

**Self-motivation without continuous action is like an athlete who does not practise and therefore does not achieve the desired results.**

Some of the most important action skills at university are, of course, effective study skills. As I have already mentioned, skills have to be learned consciously. My experience, however, is that this is one of the skills that is most neglected and that a growing number of students need help urgently in this respect.

Both space and the focus of this chapter, however, prevent me from going into detail on the aspect of study skills. I would nevertheless like to recommend that you seriously consider enrolling for a recognised workshop on study skills. Stellenbosch University has also developed a DVD on study skills – *EquipU4: LearnWell4Life: Boost your brain for study success* – which is available in English, Afrikaans, and isiXhosa) (*EquipU4*, 2007).

Here then some very basic tips that play a pivotal role in effective studying (which are also discussed in more detail in the above-mentioned DVD)... just to get you interested to know more about the topic:

- Getting the most out of your lectures. The academic year is too short to learn only a little or even nothing during your lectures—subtract the time you will spend in lectures each day from the total time left to study each day, and you will see what I mean !. It is, therefore, your responsibility to learn as much as you can during your lectures. Your lecturers accept that you are the learner (this links up with the theme of this chapter).
- Organising all those masses of your learning material in such a way that you make them your own in the best possible way. The reality is that you are given notes and inputs by your lecturers but that they are still not necessarily yours. Making learning material your own requires specific individual skills.
- Successfully approaching subjects (modules) that require specific (special) problem-solving skills.
- Effectively managing your time (one of the greatest problems for students worldwide).
- Maintaining a healthy balance and effectively managing stress.
- Effectively preparing for your tests and exams and successfully carrying this preparation through to those tests and exams.

## The 6 of the approach

**Tips 8 to 13:** Apply the above last 5 characteristics (focus, self-discipline, perseverance, positive attitude and action) broadly to all 6 recognised dimensions of well-being – not only to the social dimension! All achievers (and therefore also academic achievers) know that life achievement is an achievement of balance. This means applying action to all 6 dimensions of well-being. To recap, these are:

- the intellectual (academic) dimension;
- the emotional dimension (get help from professionals in good time if you feel that you need it!);

- the physical dimension (exercise and relax regularly and eat healthily and regularly);
- the career dimension (work on your future career now already by building up networks and expanding your CV or portfolio. Employers are increasingly looking for people with more than simply degrees: they are looking for people who, for example, can work in teams and have already worked in the broader community. Appropriate practical experience, such as work experience or internships during holidays, is also an indication of good applicants. An additional advantage of building up this type of experience is that it can motivate you to finish your studies as soon as possible!);
- the social dimension (plan regular and responsible ‘break-aways’ to relax; this is part of both a healthy balance and the ‘university of life’); and
- the spiritual dimension (keep searching for the true meaning of life – for a higher purpose in everything!).

**These 6 dimensions of well-being are interactive but, the more you cultivate these through the 5 characteristics mentioned above, the more easily you are academically self-motivated and therefore a potential candidate for academic success.**

### **The 5 of the approach**

**Tips 14 to 18:** This all makes sense – which is why – I am sure! – you are now really interested. Here are 5 final good and practical tips that link up with the key factor, namely action, the crux of self-motivation. These help to convert the 7 characteristics in the 6 dimensions into real actions:

- All normal people have the potential to change and improve performance. This lies at the heart of self-motivation.
- To make this concept your own, you have to free yourself continuously from your view of negative limitations and realise that you are more than your own past and even your own present – you are also your own future.
- These two above-mentioned “private victories” are determined largely by what you yourself continuously feel and, in particular, “say” about yourself (this is known as ‘positive inner speech’). Think about it: you cannot be or become what you do not believe or think about yourself or say to yourself!

- The result of making the above a lifelong task for yourself is positive feelings about yourself and your abilities and about both your current situation and your short, medium and long-term situation.
- This all contributes to your own positive thoughts, a recognised, essential factor for self-motivation.

**And there you have it! Not a simple recipe – self-motivation does, after all, require self-insight, self-discovery, self-decision taking, self-action and, in particular, self-recovery – but these are the realities of the ‘university of life’!**

I’m ending this chapter with a practical example that illustrates the 7-6-5 approach.

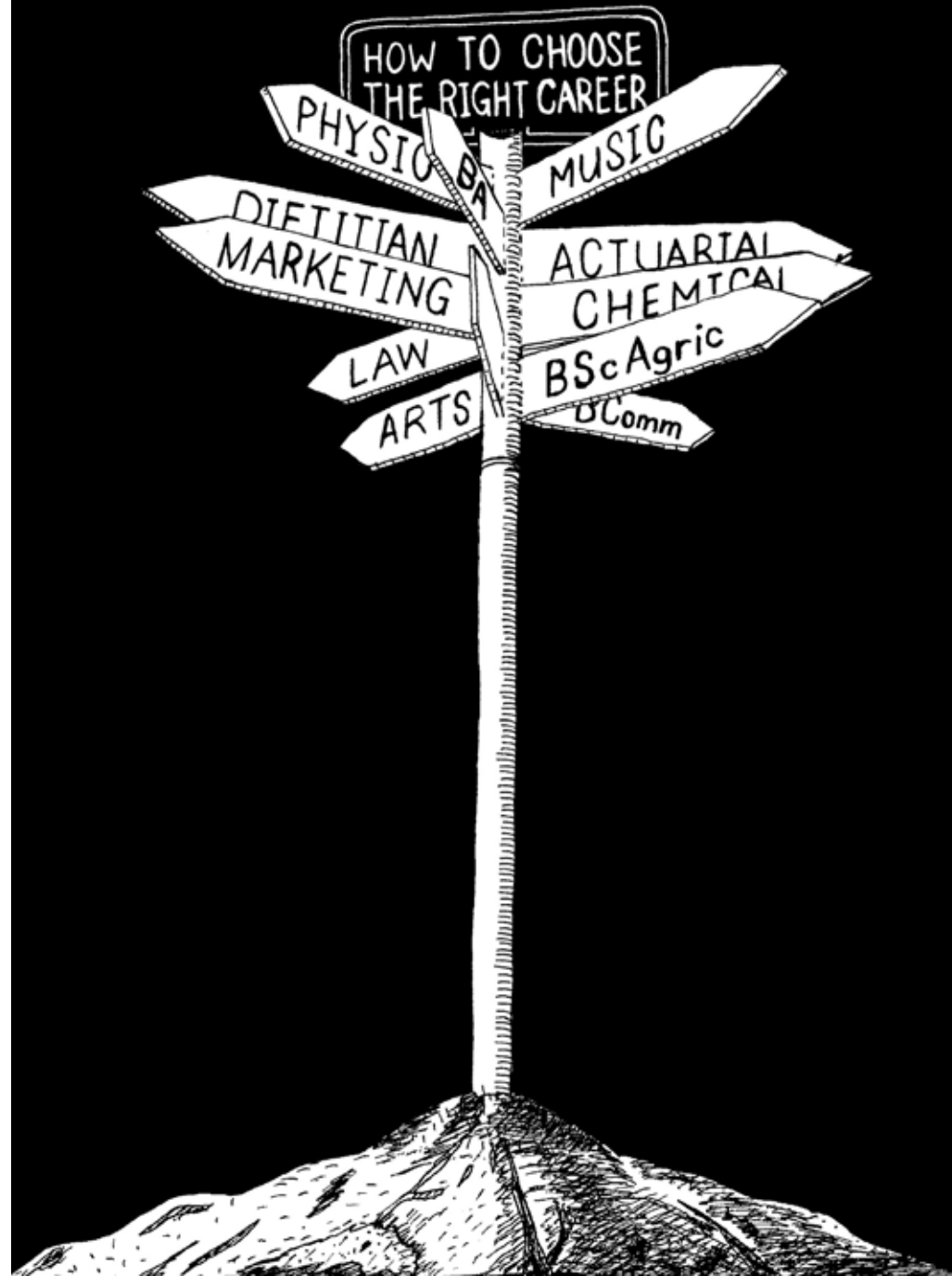
A few years ago, a third-year medical student was referred to me because he wanted to give up his studies – because “I’ve lost self-motivation for it”. A thorough investigation revealed that he did not have any deeper underlying reasons for his lack of self-motivation but that he had simply lost his vision for his career (and therefore his focus etc.) and was concentrating too much on his social dimension. After a few sessions during which we focused on the 5 of the approach, he rapidly started achieving academically again. And today he is a successful medical doctor in Canada!

I would like to invite you to apply this 7-6-5 approach to other challenges that you may experience in your life as well. And, if you cannot bring about positive developments or changes over time with this approach yourself, I wish to encourage you to consider professional help in good time.

Enjoy the process of self-learning and self-living – the result, largely, of the process of continuous self-motivation (or, put differently, of self-movement).

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*If you know what career you want to follow, then go for it. Wanting to do something is the simplest and best reason for doing anything. An approach like that cannot, however, always be applied to a field of study. Often people think they know what they want to do, but they do not really know who they are and what they are capable of. Prospective students also do not always know about other possible fields of study, except those they have in mind. It is therefore a good idea to get professional help in order to determine what you really want to do and what fields of study are available.*

An appointment with a guidance counsellor and completing at least one good interest questionnaire is a very good idea. It does not require much effort and is a small price to pay to prevent several detours. There are so many fields to choose from that you need someone knowledgeable to lead you through this maze. You have relatively little to lose and a lot to gain. After all, you make your own decisions.

## HOW DO I MAKE THE CHOICE?

Sometimes we tend to think that the choice of a study field only depends on personal interest and the available courses offered by universities. Although it is the right starting point, you need to consider three important additional factors, which I need to explain briefly.

### **1. Be realistic**

Being realistic means your ability to pass/succeed in a field of study. It won't work if you attempt something that is beyond you.

Your school achievement will give you a good indication. Let me give you an example. If you have struggled to pass mathematics at school, the chances are very good that you will fail it at university. That means that Engineering, BSc and some BComm degrees are out of the question. A broad guideline for many prospective students is that you can expect to drop approximately 10% in direct continuation subjects like mathematics, chemistry, physics, etc. You need 50% to pass university subjects, which means that you must achieve more than 60% in your matric subjects in order to feel safe. Usually this "safety zone" is set by the admission requirements of the different faculties. You will, for example, not get admitted to Engineering if you don't get at least C symbols for

mathematics and physical science at school. Nearly all research studies show that in the case of most students current or previous achievements are the best predictors of future achievements.

School achievement is, however, not always an indication of how you will fare at university. It may be (the case) that the majority of your school subjects do not interest you and that you were unmotivated to study, but that it is not the case with your university course. Sometimes school learners, especially boys, are not yet study ripe. Sometimes they focus too much on sport and extramural activities and find it difficult to spend enough time in front of their books. In some cases the home and study situations are not ideal and this makes achievement at school difficult.

However, it is a fact that no one can afford to skim on his or her school education. It is the foundation on which you continue to build and your admission to courses is subject to good school marks. If you rather prefer doing practical things and cannot always master the volumes of work, are not prepared to sit and study and do not feel up to coping with larger volumes of work, then university might not be a realistic option.

Although it is important not to be unrealistic about yourself, you must also not dampen your idealism. It is good to have a dream, but when you reach for the stars, first make sure that your feet are on the ground. Failure at this stage in your life is something you must avoid at all costs. Materially and psychologically it is just too high a price to pay.

## 2. Be wise

This means that you must make sure that you will get work with the course you follow. If you only find out afterwards that you can do little or nothing with your qualification, then it wasn't a wise choice.

The general economic law of demand and supply applies here. If the demand for your qualification is higher than the supply, you won't need to look for work – the work will look for you. In this regard matriculants also need long-term advice and not just advice on where you can find work after your degree. For example, look at the projections of the Institute for Futures Research to see how the job world is busy developing and changing.

One of the tendencies that are currently coming to the fore in the Western world is that students first do an academic degree, for example a BA degree in Humanities or Arts and then add a job qualification to it in their fourth and/or fifth year. The English call it "first an education and then a vocation". In practice it means that after you have received a broad academic education

(for example a BA degree) you get a job qualification in, for example, Tourism, Public Relations, Event Management or Journalism. With this background you should be able to do your job on a high level.

Something you should not lose sight of is the fact that your academic achievement, as well as other achievements at university level (for example leadership and community service) can make you a sought-after candidate for employers, even if you follow a popular field of study. The employers are interested in the best students. You should therefore be ready to achieve wherever possible.

## 3. Be logical

Does the course that you consider suit the type of person you are? Here the focus is on your personality. Are you shy, reserved and very private, or are you very sociable and like to perform in front of people? Do you like working in a group and leading, or do you prefer one-on-one situations? Are you mainly task-oriented? Do you like persuading people? Can you handle conflict? Are you curious? Do you see yourself as thorough and a perfectionist? Are you adventurous, impulsive, energetic, or more careful and methodical?

How will you know? Although personality tests can be very meaningful, it is not always necessary. Often your friends and family can give you good feedback on what you are like. You yourself will know what is really applicable to you, especially if different people tell you the same thing. Know however that you are a unique person with a set of characteristics that defines your personality and distinguish you from other people.

There is a specific connection between your personality, your field of study and later on, your job. Every job has certain personality requirements. If for example you want to be a public relations officer, beside your aptitude for language and a feel for style and finesse, you need to be a social, responsive and extrovert person who blossoms when performing. If you are an introvert, this job will place a lot of pressure on you, despite your aptitude for language and your creative ability.

You need to do your homework with regard to the requirements that your choice of profession will entail. Many career guidance sources provide this type of information, but it will also be good to talk to a couple of people working in the particular field. It is a good idea to not just speak to one person; else you might get a skewed perspective. Job practitioners are usually flattered when asked about their jobs. They like to talk about all the relevant pluses and minuses. Their perspectives can be very valuable to you, as long as you

remember that you are looking for information and not for advice. People often give advice because they make the mistake of thinking that you will experience things the same way they do. But you are a unique person. In this regard work shadowing is a good idea, because it helps you to get a realistic perspective of a certain field. Also try to do a search on the Internet on your field of interest.

### **Other factors that will also determine your choice**

Many decide for or against courses based on their values. Sometimes the material value, making money and getting rich, is a dominant value. It means you choose a field in which you will realise that goal. It is not immoral to argue like that – it is just another way of choosing. What you have to take note of, however, is that research indicates that mere material success seldom leads to job satisfaction. If you like what you do, it is easier to get up in the morning, you will do more than is asked for and your work will become such a positive factor in your life that it will also have a positive influence on your free time and family and community life. If you don't experience job satisfaction, then the opposite is true. Besides making money there are also other values, which could have a directive influence on your career decision. Humanistic or religious values come to mind. Someone can for example feel called to help the destitute and can for example go and work in the inner city or the mission field.

It may happen, however, that values and needs are confused with each other. Values are the things that are important to you and that you believe in, while needs are the things you want from life. You can for example have the need to use your intellect, or to work independently and make your own decisions, or to work in a beautiful environment. A very general need for several learners is that they don't want to end up in an office. They want mobility and to be able to work outdoors. I can understand this, but the fact remains that only 10% of jobs are outdoors and that these people also have a number of administrative job aspects, which need to be done in an office.

### **WHERE DOES “APTITUDE” COME IN?**

You might wonder why I haven't yet spoken about aptitude. Ought it not be the main consideration in choosing a field of study?

What is aptitude? It can be described as your ability to do a certain aspect better than other aspects in your spectrum of abilities. Sometimes it is in your genes – if your father or mother was excellent in mathematics, music or

languages, it might also come naturally for you. Sometimes it is a good talent that you have developed through exercise and commitment, for example gymnastics or ballet. Naturally this talent or “aptitude” will play a role in your choice of a profession. If you have already received prizes or junior national colours at school, the chances are good that you will be able to make a career out of your talent or aptitude (without it necessarily being one of your school subjects).

Aptitude for academic contents, for example languages or mathematics or business studies, will usually be reflected in your school achievement. But an aptitude for study material also has a lot to do with exposure and knowledge. We know that a highly intelligent person's fourth or fifth best aptitude is still good enough for him/her to be successful at university. The best aptitude field is therefore very important for somebody with more limited or average intellectual abilities, because it will probably be the only field in which he or she will be successful.

### **PARENTS**

Why does it happen that matriculants choose to study in the same field as one of or both their parents? A few reasons can be given. I'll only mention two:

The first is that you have inherited your parent's aptitude for a certain field (for example mathematics, medicine, accounting, languages or music). It is also your strongest field and that is why you follow it. The benefit of this is that you have a very realistic idea of what the studies and career entails. It will be a firsthand and well-informed decision.

The second reason is that you often have to take over your parent's business enterprise or practice. It is also not necessarily bad for your development and your relationship. However, if you only choose your parent's career path because it seems familiar and safe, then it probably is not a good decision. You then need professional guidance to find an appropriate field of study. Never underestimate the influence and interest of your parents in your decision: you cannot really choose independently of them, because you need their moral and material support; your parents also know you very well and with their experience they will be able to give you useful tips on where your talents can be put to good use. Conversations with them on what you are considering are therefore appropriate, but in the end the decision should be your own. It is you and not they who will have to follow the field of study and the career. You must take responsibility for it.

What other influences sometimes influence our career choices? The mass media, especially television, can easily give students a skewed idea of what a profession entails. The medical profession or legal practices are often portrayed on TV series as romantic and attractive. Sometimes they only focus on the exciting aspects and not on the hard and dedicated work that is required. Advertisements are also inclined to emphasise the positive characteristics of a profession and sometimes give adolescents an unrealistic view of the profession.

## WHAT SHOULD I DO IF I REMAIN UNSURE?

Despite everything that was said so far, we know that uncertainty is still a big factor. To tell you the truth, many prospective students are paralysed by it. For those, on the other hand, who know what they want to do, it is normally better to continue their studies directly after finishing school. They are in a study rhythm and their basic knowledge is still at the tips of their fingers. Never the less uncertainty or doubt affects most people.

It is necessary to distinguish between two types of uncertainty. Most students experience temporary uncertainty from time to time. There are obviously many first-year students who are still very unsure during their first months of study. Every university has departments for student counselling where you can go for help with your study choice. These professional persons won't be able to decide for you and remove your uncertainty, but they will make things a lot easier for you.

Usually you can still change your course or subjects within the first three or so weeks. Despite being three weeks behind in the new subjects and/or course and, that isn't ideal, it is still better than studying the wrong course or subjects. If you struggle to decide on your subjects, it often helps to take more subjects than necessary and to then choose the four or five you like best. Choose the subjects where you experience chemistry between you and the subject. After a few lectures you should know whether you are going to blossom in the subject or not. Also remember that you will probably not have the same lecturer for longer than a term.

Some learners and students remain chronically unsure. If you have followed all the above steps and are still totally unsure about your field of study, you are probably not ready to go to university directly after finishing school. Rather than just choosing what you feel you must, it might be better to first do something else for a year and to see if things do not become clearer with regard to your field of study. However, you must not just stay at home and do nothing.

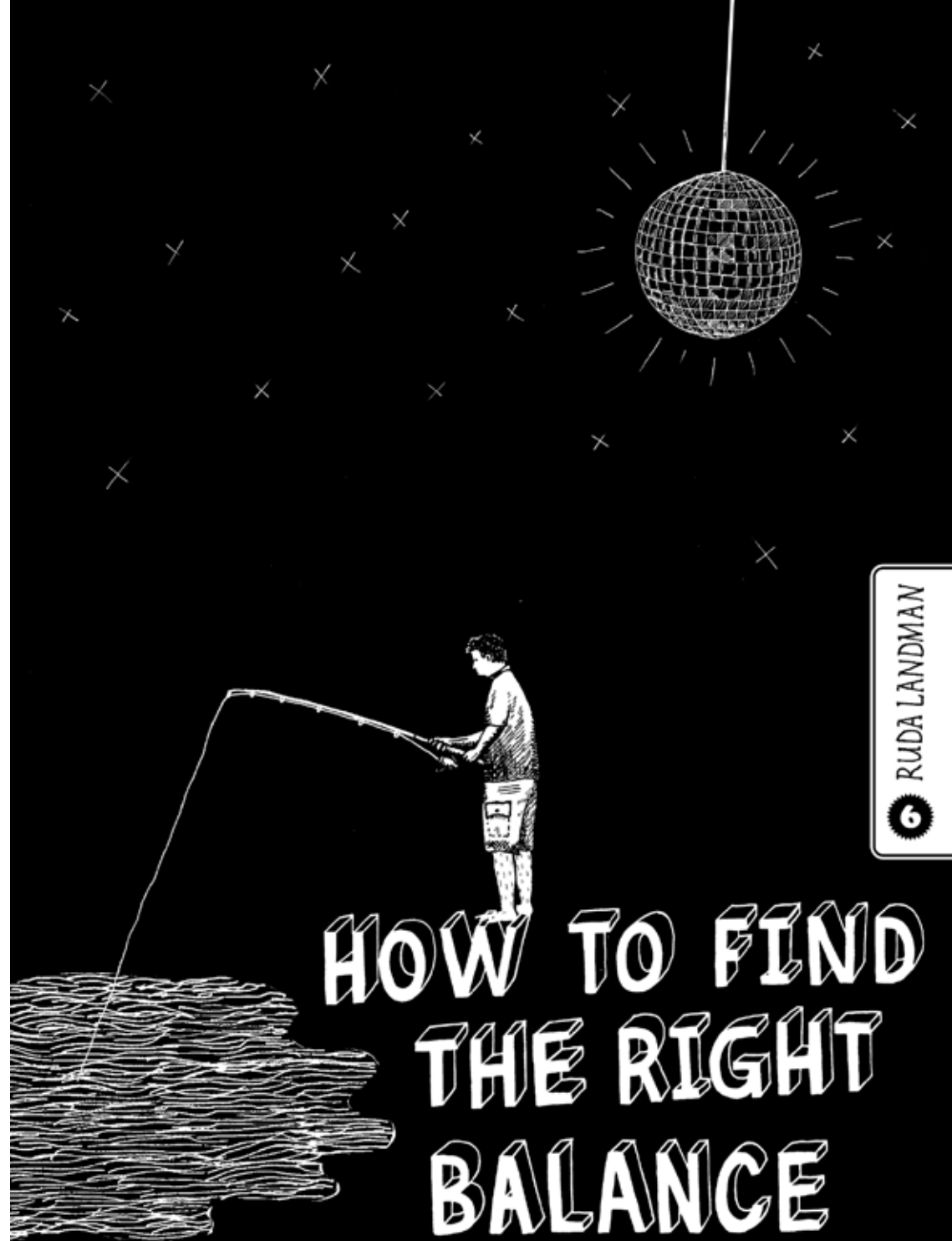
Psychologically that is very unhealthy. Rather go and work somewhere in South Africa or overseas, do a service year, or do a course to become computer literate while you work on a part-time basis and earn money. Often you also find learners who feel that they need a break after school. They are tired of learning and within a year or more will once again be ready for studying. In that case it is not a bad idea to have a gap year and do something else for twelve or more months.

It is important to keep in mind that uncertainty can be overcome. If you study hard right from the start and feel like you are in control of your course, the uncertainty will start to disappear. You must believe in yourself. You must believe that you have the ability to be successful. You have chosen the field that really interests you and the one that you know you can be good at.

We live in a work-oriented society. If you can realise your career potential by making the right study choice – something that is realistic, wise and logical for you – you will have a happy, productive and meaningful life ahead of you!



# **3. MAKING THE MOST OF UNIVERSITY**



# HOW TO FIND THE RIGHT BALANCE

6 RUDA LANDMAN

***In 1912, textile workers in America organised one of the country's first strikes. At that stage they were working 56 hours a week for a wage of between \$6 and \$8. When the government shortened the working week by two hours, the factory owners cut their wages and let the machines run faster to make up the time. The workers therefore earned less and worked harder and, because of the new intensity at which the machines worked, more accidents took place. Under the leadership of a 21-year-old woman, and in reaction to these developments, about two-thirds of the workers went on strike for nine weeks in the icy American winter. They demanded better wages, shorter working hours and payment for working overtime. Their motto consisted of two simple words, but contained a deep existential truth: bread and roses.<sup>1</sup>***

I think this is what we all strive for: a combination of bread and roses – and, as I will indicate later, a combination of fishing and dancing. *Bread*: everything that feeds and maintains us on a practical level. *Roses*: those things with no practical value (except their impact on a girl's heart!), but which touch your soul and make living worthwhile.

## **TIME TO MAKE YOUR OWN CHOICES**

Why is it that so many of us – everyone, generation after generation – underutilise our university years? It is such a rich environment: so much to learn and discover; the best opportunities for sport, for music and drama and every possible form of word use, for science and experimentation; a place where you are surrounded by people who can become lifelong friends, people from all backgrounds and with every possible interest ... and so many of us simply let it slip by.

<sup>1</sup> A Google search using the keywords "*bread and roses*" *strike 1912* gives a whole range of excellent articles on the topic. I took my references from Debra Pawlak's article, "Girl power: The story of the Bread and Roses Strike" on [www.themediadrone.com](http://www.themediadrone.com).

### **It is all about choices.**

After all – as the saying goes – if you are going nowhere, you definitely will get there. If you simply let opportunities pass, without really thinking about the possibilities they hold and which of those possibilities you want to use, you will look back many years later and curse yourself. You could have done so much, you did so little. Because we do so many things in life without ever making a decision – we simply drift into it.

It is understandable that first-year students are not really in the mood for making big decisions after their matric year. There are not many periods in your life when you are as busy as in matric. Managing half a dozen or more completely different subjects, sport, debating, drama, art, ballet, leadership positions and, of course, an active social life is not child's play. No wonder that the vacation after the final matric examinations is enjoyed to such excess! School is an extremely structured environment in which you know exactly what is expected of you when, and in what form. Work, sport and whatever extramural activities are divided into daily and weekly units and there is always someone asking about your progress, and making life unpleasant for you if it is not what he or she thinks it should be. By the end of matric you are sick and tired of this. You want to be your own person, determine your own priorities, go your own way.

“Just leave me alone!” is probably a regular thought, together with quite a few other, less acceptable remarks under your breath ... But at the same time you also know that there is a phalanx of older people who are concerned about you and make an effort to ensure that you make the right choices (in their opinions!) and utilise your potential as far as possible to make your matric year easier than it could have been. And herein lies the rub. You want them to leave you alone, but not entirely.

The transition from school to university is literally the beginning of the rest of your life, when you and only you are in control of your choices and your decisions. You no longer have the same support that you had at school. Although your parents most likely are still playing a big role at this stage, your friends' views are important, and maybe even those of a teacher who became a mentor to you, in the final analysis it is your life. You want to make your own decisions, and you *must* make your own decisions.

We all tend to blame others for our decisions. “I actually wanted to be a ballet dancer but my father said it was not a job for a man.” “If I could do what I wanted, I would first have worked on a yacht for a year, but my girlfriend (or boyfriend) said then it would be over between us.” “I wanted to study physics,

it's my passion, but my mother said my life would be too lonely; no man wants to marry a scientist.” “I actually wanted to go to a university of technology, but my best friend convinced me to come here – and they do not have the technical subjects which really are my strong suit.”

Each of these statements is probably true. All those people have opinions on the choices that one makes. They are probably not shy to express them over and over again, with great conviction. But if there is one thing that you have to understand now, and remember for the rest of your life, it is that your decisions are your own.

Say *the ballet dancer's* father had said he would not pay for such a ridiculous project. That would mean not only emotional pressure, but a change in actual circumstances. The young man would still have a choice: follow the easy path and study with Dad's support in a field that does not really interest him; or find a way (just like thousands of South African students whose parents cannot support them financially) to fund himself and do what his heart desires.

What about *the one who wanted to work on the yacht*? Yes, your boyfriend or girlfriend probably does not like the idea. But it is still your decision whether you satisfy him or her, or realise your dream. Do you want to continue in a relationship with someone who wants to control your life? What do you think will happen in the long run? If you have it in you to consider the possibilities out there in the world in such an adventurous way, what would happen if you sacrificed this vision at the age of eighteen or nineteen for the stability and familiarity of a relationship? It is not your boyfriend's/girlfriend's fault if you give in!

The same is true of *the future physicist*: once you have considered your mother's viewpoint, your decision is still your choice. In the first place, do you agree with her? In the second place, if your interest in physics is really that strong, would you sacrifice it for the sake of a man who only exists in someone's (your mother's) imagination?

This is true every time: other people provide input, but you make the choice. One obviously asks other people for their opinion before you make decisions – your common sense tells you it is a good idea to do so. But eventually the decision is your own. It is your privilege, and your responsibility. As long as you think you are a prisoner of the convictions or preferences of the people around you, you are going to let your life slip through your fingers.

On the one hand, this new freedom to make your own decisions is very *exciting*. On the other hand it simply is a harsh reality that, at university no one else is going to do it for you, which can be somewhat *terrifying*. Even if you live at home, there is no communication between the lecturers and your parents,

which means that no one else will know whether you are doing what you are supposed to be doing – you are in control. You can study or not, take part in sport or not, go out every night or not, play computer games all night or not. Are you going to participate in rag? How often will you bunk class? Are you going to do all your reading, or only just enough to pass? So many possibilities. So many choices. And the greatest danger is that you don't think about it and don't make a conscious decision. Because six months later you are going to find that you have established a pattern, whether consciously and deliberately or not.

### TIME TO DETERMINE YOUR OWN PRIORITIES

Many students at South African universities have to repeat a year or never finish their courses. Are you going to be one of them? How do you feel about this possibility? Does it matter to you, or do you regard your time at university as a sort of finishing school before you start working in your father's business, or play professional rugby or soccer, or open your own restaurant? On the other side of the scale, do you regard it as important to perform academically? Does it bother you if your marks drop below 50%?

#### **One can put it very simply: what are your priorities?**

Are you going to get up for your eight o'clock class, and also for most of the classes after it? Are you going to help build the float tonight ... and do an all-nighter? Are you going to play rugby for the residence this semester? Are you going to apply to join the editorial staff of the campus newspaper? Are you going to go out tonight? How much are you going to drink? There are no right or wrong answers, but there definitely are consequences.

#### **Your priorities determine the choices you make.**

Students often make their choices based on their budget. Decisions are shaped by one question: what does it cost? If I do a, I cannot afford b and c and d. We understand 'opportunity cost' long before we learn the term. But there is something else of which we also have a limited supply: *time*. In fact, it is much more limited than money – one could always borrow money, or convince Mom to pay something into your bank account, or look for work as a waiter. Time, on the other hand, cannot be bought or sold by anyone. If it is gone, it is gone. Anyone who has tried to convince a teacher or a lecturer to move a deadline knows this all too well!

Every possibility that we mentioned above – even those that do not cost any money – has a price tag marked in weeks, days and hours. Tonight's all-nighter building the float will cost you your concentration in tomorrow's class. Rugby twice a week means less time spent with your girlfriend – or else you must study less, or spend less time with your friends. The work on the campus newspaper will use up time that you could have spent otherwise. It is actually quite logical ... if you just think about it for a moment. The problem is, too often we do not think. The rugby team is discussed over coffee, there is an opening, someone remembers that you played well at school, and before you know it you have tied yourself down for six months. You meet a cute guy who writes for *Die Matie* or works at UJFM, you enjoy your shared interest in words and debate, and before you know it you are sitting through the night editing copy.

### CORRECT PRIORITIES + CORRECT CHOICES = FISHING AND DANCING

I began the chapter by making the point that we need bread *and* roses to truly live, and I followed this by saying that it does not simply happen to us: we must first think carefully about our priorities and choices to find this balance.

Let me tell you an old fable that I believe illustrates this pursuit of balance best.

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*In a cold northern country there lived a lonely fisherman. He was so lonely that his tears had carved deep furrows into his cheeks. He went out fishing every night, but his life was without meaning.*

*One night, as he was rowing across the cold water all by himself, he heard the most beautiful sound: the laughter of women. He went closer, his heart in his mouth. What he found were seven women, dancing on a rock in the moonlight while they laughed and talked with voices like music. He rowed even closer. Hidden underneath a rock nearby he found seven seal skins. He took one and hid it under his parka. He waited. The women ended their dancing and came to look for the skins. They were seal women who could live on land and sea. Six of them put on their skins and slid into the water. The seventh remained standing, trapped on land. The man approached her. He begged her to stay with him and become his wife, to end his loneliness. She pitied him, and against her will she gave in – but*

on condition that it would only be for seven years. Then he had to return her seal skin and she would decide what she wanted to do.

Together they made a home, and they had a son called Ooruk. His father taught him to fish and make tents, and his mother told him stories of seals, whales and dolphins. Seven years came and went. The women's eyes became dull, her hair started to fall out, she started limping. One night Ooruk woke up and heard his parents arguing.

"I must have that of which I am made!" It was his mother's voice, still like silver music, but now thin.

"And then? Then you will go away, and leave me without a wife, and the boy without a mother! You are bad!" His father roared like a bear and stormed out through the tent flap.

Ooruk lay in bed shivering. Suddenly he heard his name in the wind: "Oooruk! Oooruk!"

He jumped up, put on his parka and his bear-skin boots and ran out, following the voice. "Ooooooruk!!"

The voice led him to the rocks at the edge of the water. There he stumbled over a seal skin, and when he picked it up, he saw an old, silver seal sinking below the waves with something like a smile on its face.

Ooruk carried the skin back to his mother with tears in his heart. She took it and put it on. Then she took the child's face in her hands and blew her breath deep into his lungs. Holding him under her arm, she dived into the sea, and the mother and son could breathe easily below the blue waves. They found the old silver seal, the child's grandfather, and spent seven days among the seals. The women's skin grew shiny and smooth again, her eyes grew bright, she swam easily and gracefully. Her father asked her about her life on the land.

"I broke a man's heart by leaving, Father," she said. "Without me he is just half a man. But if I stay there I will die."

"And my ... grandson?" His voice broke with pride.

"He is both of us. He can live there, but yet share in what I have here."

On the eighth day she and her father took Ooruk back to the land.

"I am always here," she assured him. "Come, and we will talk. Use my knife and my fire sticks, and you will know I am with you. Come to me, and I will blow into your lungs a wind for the singing of your songs."

Over the years the young man became famous as a strong and skilled fisherman, but also as a poet and singer who sang people's hearts into his song.

*And they believed that it was because he was taken away to the land of the seal forefathers when he was a child, and because he returned from there.*<sup>2</sup>

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I believe the first two characters live inside each of us: a fisherman, and a dancing woman. We have to fish – we have to work, study ... to do everything that can be described as 'duty'. It is no accident that the expression "to make a living" means to work and earn money. Without work and the money that we earn from it, life will be tough – just ask the man at the robot with the begging board around his neck.

We not only *have to* work, we also *want* to work. We want to use our abilities. Just think of the joy it brings if you have a talent for sport and you use every muscle to achieve your absolute best, walking off the field dead tired at the end of the match. The same happens when you use your intellectual abilities. You want to extend yourself, see how far you can get, what you can achieve, just as you want to use your muscles so that they do not waste away and become useless. But work alone is not enough. That is not the way to a complete life.

Because we also want to dance. We have to. Otherwise our eyes grow dim, our hair fall out and we start dragging a foot; the fisherman becomes so lonely that his tears cut furrows into his cheeks. It is necessary to dance. We must have bread, but also roses.

Some students have no problem putting the emphasis on the dancing and the roses. You don't have to be convinced that it is necessary, it comes naturally. You want to limit the fishing part to the minimum, particularly now, just after school, when you probably feel that there still is a lot of time before you have to look after yourself – and maybe after others.

However, for many young people it is important to put as much emphasis as possible on the bread and the fishing. Many young people in South Africa have had to take responsibility from an early age, sometimes responsibility that is much too heavy for a child's shoulders. Under those circumstances you finish school and go to university with the fisherman's tears etched into your cheeks already. For you, the idea that it is necessary to dance, and to play, is almost abhorrent. After all, you got to where you are, with the doors of the university open in front of you, through work and even more work. You have to discover at university that people cannot live on bread alone.

<sup>2</sup> I have summarised the story on the basis of the version in *Women who run with the wolves* by Clarissa Pinkola Estés, Random House, 1993.

Whatever your background and your perspective at present, the path to balance, to a meaningful life, is to accept that both these parts of your self need time and space. Ooruk, the strong, successful young fisherman with the song that touches people's hearts, expresses all that he can be. This is the ideal. Working all day and every day as a student will lead to depression and loneliness. On the other hand, playing all day and every day will be boring and empty – apart from the fact that it probably will cut short your time at university! In fact, alternating between the two gives each of them flavour and interest.

There are also less obvious benefits in a combination of work and play, of fishing and dancing, of bread and roses. As described in other chapters in this book, a university is actually more an idea than a place – as you know, one can study by mail; or do it subject by subject extramurally; or just take a short course and leave again. Seen like this, the university is about acquiring new knowledge through research, and the transfer of existing knowledge through teaching. This is what your 'work' entails in your years as a student: mastering as much of the available knowledge in your chosen field as possible. Never again will you have such easy and direct access to so much knowledge. Knowledge in books that are brought to your attention; knowledge on the wonderful internet to which you are directed and guided; knowledge in the form of teachers who have spent a lifetime working on their subject. As a full-time student you have time to immerse yourself in it, to surf the knowledge and information network just as you surf the internet. It is like the sea: as long as you are scared (or lazy) and remain in the shallow water, it is terrifying, cold and hostile. But once you have mastered the surfboard, standing up so that the water can carry you, it becomes exciting and compelling – and it carries you further than you ever thought possible. One book leads to another; a web page refers to an article that refers to a book in which someone is quoted who made a speech that is available on the web ... and the first time that you ask an intelligent, informed question or make a contribution to a class discussion is a high that is worth every ounce of effort.

## ATTRACT THE FISH THROUGH YOUR DANCING!

One discovers unexpected things about yourself when you learn to work and to play. You may paint a float for rag and discover a creative talent you never knew you had. You may run for the residence committee and discover you can organise people. Someone may convince you to take part in the first-year concert and you find you are the hit of the evening. These talents be as

important in your career as the content of the course you have chosen. We live in a time when few people stay on the same career path throughout their lives, and in which many of us have to create our own work. If you try everything and anything in the relative safety of the university environment, you will be giving yourself many more options when you have to choose a job.

And if you participate in something you have never tried before, you might just discover your 'passion', something that you do much better than most other people, and that makes you feel as if you were put on earth to do just that. This idea has become such a cliché, that one can easily become cynical about it. Most people work for much less poetic reasons. But just imagine...! What a joy if you could develop a career built on something that makes your entire being sing – or, to return to the metaphor above, if you could lure the fish by dancing!

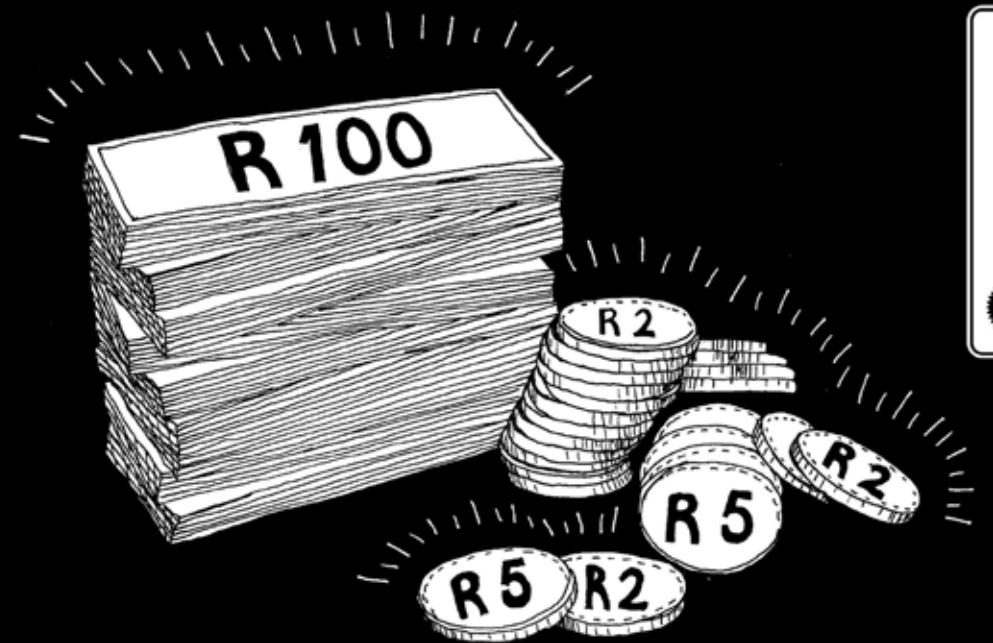
In summary, therefore: to a great extent, university means the freedom to do (and not to do) what you want, when you want. Take responsibility for your own priorities and decisions; attach value to your time; and find a way to work *and* to play; to fish *and* to dance; to make space for bread *and* roses. At the basis of all of this is respect for who and what you are and can be. If you do not think that you matter, then your time and how you spend it also will not matter.

There is a famous quotation that is often ascribed to former president Nelson Mandela, but which actually comes from a book by Marianne Williamson: "Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light, not our darkness, that most frightens us."<sup>3</sup> In this country, with so much at stake, each of us matters. Only four per cent of South Africans over the age of 20 have a tertiary qualification.<sup>4</sup> We who have the privilege of being part of that small group do not have the luxury of questioning whether we matter. Use your years at university to discover all your possibilities, all the light and power that live in you, and give it your all every day for the rest of your life – for the sake of all of us.

3 Williamson, M. 1996. *A return to love: Reflections on the principles of a course in miracles*. New York: HarperCollins.

4 Statistics SA. 2005. *General household survey July 2004, 2005*; as quoted in *South Africa survey 2004/2005*. Johannesburg: South African Institute for Race Relations.

# How to balance your budget



ESTIAN GALITZ



***Students come to university for many different reasons. Certainly, most of them are there for the right reasons: for a broader education, to better prepare themselves for life ahead, to obtain knowledge and to develop their ability to think critically and solve problems. There are of course also those who don't take their studies seriously, who are led astray by the fun of student life and the freedom to be away from the discipline of school and the parental home. And there are even parents who send their children to university because they think it will cost less than the damage they can do at home.***

There are also those who don't know what they want to do with their lives and come to university to see "if it is for me". There was a student who at the beginning of the year was asked by a lecturer for which subjects he wanted to enrol, to which he answered: "I don't know; what have you got?" The following story will attempt to capture some of the different reasons – and consequences – of going to university.

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*Once upon a time there were three young people, John, Thandi and Rashid. They became friends when they did lifesaving together at Margate in grade 9. During the December holiday at the end of grade 11, they seriously started talking about their future after school.*

*John struggled at school, but was an excellent sportsman. He thought about going to France for a few years to play rugby and see what life has to offer. In any case, his dad did not have money to pay for further studies. Thandi was a good student and wanted to become a medical doctor, but her school didn't offer mathematics and she wouldn't be able to get admission to medical studies. Rashid was head boy and dux scholar at his school and wanted to do actuarial studies.*

*After school the friends' roads parted. It was only twenty years later, at a Margate reunion, that they met each other again. Excitedly they told each other of their experiences.*

*"So John, did you go play rugby for France? You must have, since the French now prefer playing soccer because the French rugby team hadn't won a game in twenty years," Rashid joked.*

*John looked at him with a serious expression. "My father passed away shortly after I went to France. I came back and took over his photography business. It was tough going, because in the town where I'm from, people don't take a lot of pictures. When the digital camera arrived I took a risk: I sold the business (not for very much), moved to the city and for three years I rented an outside room in a*

*shabby neighbourhood and sold cleaning products. Because of my background in the photography business as well as a contact from an old rugby friend, I succeeded in importing the first batch of digital cameras to South Africa. Later on I become the biggest international camera producer in Johannesburg and started making sport videos. When my partner and I got the licence for the filming of the 2010 Soccer World Cup, I got my big break: the beginning of a successful business.”*

*“None of you is asking about me,” said Thandi. “I finally got provisional admittance to study medicine, but I first had to complete my mathematics. It took two extra years and increased the cost of my studies. I did have a bursary and loans, but it wasn’t enough. In the evenings between six and ten I worked at the local hospital in order to pay my debts. But I wish that for nobody. I studied until three in the morning. At the end of my third year, my health was impaired and I had to sit out for a year. But I persevered and I finally finished everything – and later I specialised as paediatricist. It took me ten years to pay off my debt, but it was all worth it. My practice is financially healthy, but the best of all is that I can live out my passion in my work.”*

*“Guys, my story is not such a happy one,” said Rashid, who was unusually quiet. “My first year was a huge success. I passed all my subjects with distinction and won the prize for best first-year student. But it went to my head and life was just too much fun. In my second year I nearly didn’t pass. In my third year, when I became head student at my residence, the writing was on the wall. I failed my year and lost my bursary and my place in the residence. I was down in the dumps. I got a job, but earned very little. Five years later I realised that I had wasted so many chances. Thanks to my girlfriend’s encouragement, I enrolled at Unisa in a course in financial mathematics. I only got my degree when I was thirty – better late than never, but then things began looking up and nowadays I develop new financial products for a big funds manager. But the cost of wasted opportunities is very high.”*

*Two days later the three said goodbye to each other and lived long and happy lives, once again aware of the many dimensions and crooked roads of working life.*

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Whatever the reason for university studies, there is a question that every student should ask. It is also a question for all aspirant students who realise how much their parents, friends or family sacrifice financially and otherwise in order to provide them with the opportunity to further their studies. The question is: *Is the money that is being spent a good investment? Will it give a high yield?*

Wouldn’t it have been better if Thandi and Rashid – and tens of thousands of other young people in South Africa who register at universities every year – rather start working directly after school like John did? Then they can start paddling their own canoes from early on with the promise of big success like John had achieved. And that while Dad, Mom, Grandfather, Grandmother or any other benefactor don’t have to loan money or stand surety; or, if they have the money can rather invest it in shares, property or even a new business enterprise. After all the latter investments don’t talk or answer back, get sick or dispirited, or prefer an exciting night life over a boring class!

## DO UNIVERSITY STUDIES MAKE FINANCIAL SENSE?

A lot of research has been done in order to determine if university studies are a good financial investment. *The most general conclusion is that the earning capability of someone with a university degree is better than that of someone without it. Therefore the cost of university study is not a (dead) expense, but an investment.* Of course there are Johns (like in our story), but they aren’t many. Yet, a university degree is no safeguard against unemployment.

How should one think about the question in the above heading? We must bear in mind that university studies, sometimes also called higher education, hold two benefits.

The *first* is the *private or individual benefits*, that is to say the direct benefits for the individual in obtaining a higher education qualification. The *second* is the *public benefits*, which refer to the benefits for the community. Both types of benefits can only be generated by spending money. In the first case there are personal expenses for the individual. In the second case there are the expenses of the government and to which every taxpayer in the country by implication makes a contribution.

Let’s think about the benefits of university studies. In 2006 a report was published by the South African Council on Higher Education on the impact of changing sources of financing on higher education. In it there is a useful summary of the results of a study that has tried to measure the yield of different levels of education over the period 1960-1999. The figures in table 1 below show the measurable yield<sup>5</sup> on individuals’ investment in education in different areas of the world. The benefits refer to the higher income which highly schooled

5 These figures have been calculated as the internal rate of return, in other words, the rate which equates the discounted values of benefits and costs.

workers normally receive. (Other benefits that are difficult to measure and cannot be added to the calculation of such an analysis, but which further increase the value of higher education, include the fact that higher education usually make people more productive and enable them to qualify for better paying jobs.) The investment (individual costs) refers to the direct costs (tuition fees, books, stationary, etc.), the extra transport and other costs, as well as the indirect costs such as forfeited income. The latter occurs because a person who studies full-time doesn't work and therefore doesn't earn a salary. The table shows that in all parts of the world the private measurable benefits exceeds the cost with more than 10% and that the highest yield (27,8%) has been recorded in sub-Sahara Africa. An analysis of South African census statistics with regard to people between the age of 45 and 64, also shows that the average annual income of a person with a higher education qualification is higher than in the case of people with a lower qualification: A person with a master's degree earns more than someone with a Bachelors degree, who in turn earns more than those who only have a high school education.

**Table 1: Yield rate on investment in higher education**

AREA	YIELD RATE (%)
Asia	18,2
Europe, Middle East, North Africa	18,8
Latin America	19,5
OECD countries <sup>a</sup>	11,6
Sub-Sahara Africa	27,8
World	19,0

<sup>a</sup> Organisation for Economic Cooperation and Development (OECD).

*It seems as if university studies are a good financial investment, one where the benefits notably exceed the cost.* Economists refer to the expenditure on education or teaching as “investment in human capital”. This investment has different values for different people or groups. For parents or benefactors the yield on their investment can take on different forms, monetary or non-

monetary. For some there is the repayment of study debt (with interest); for others there is the pride towards a young person who grabbed the opportunity for self-actualisation with both hands; and for others there is the prospect of somebody who can look after you in your old-age. Furthermore – despite whether the investment was made by parents, family, friends, by a student who financed him- or herself or by the government (the community) – it is also an investment in a more educated (and hopefully better civilised) community, with more opportunities for everyone.

*There are of course several things that can go wrong with this investment.* Let us look at a few examples. A student can fail – like Rashid in the story. Sometimes the cause is out of the student's immediate control, for example bad health or family circumstances. In other cases the student is in a position to immediately do something about the matter, for example bad achievement due to bad class attendance, undisciplined or bad study practices and unfavourable living conditions. Whatever the reason is, if the student does not get a university degree, there is a good chance that the student's financial position will be worse than the person who started working directly after school. Not only does the person have many nearly fruitless expenses and debt that cannot be repaid, but a lot of years have also gone by during which no income has been earned. People might see the exposure to the university environment, the social culture and the contacts that have been built up as useful spin-offs. You cannot argue against that, but the benefits should be weighed up against the cost. The fact is, it can take years to catch up on the financial arrears in comparison to people who started working directly after finishing school. From a purely financial point of view, the intended investment was really just a dead loss (or close to it).

*Unfortunately not achieving a university qualification is the experience of a large percentage of students who enrol at South African universities.* The National Department of Education annually publishes the study success of students. The surveys started with the group of students who in 2000 for the first time enrolled at South African universities and technicons<sup>6</sup> for a three year degree programme. In the case of this group it appeared that nearly one third (30%) had discontinued their studies during their first year. After three years half the group had already discontinued their studies. After four years, less than one quarter (22%) had obtained their university degree. Even if we leave universities that offer distance education out of the account, we find that only half of the

<sup>6</sup> After completion of the restructuring of higher education institutions in South Africa in 2005, technicons were either restructured as universities or incorporated into comprehensive higher education institutions.

students were able to graduate after four years of studying.<sup>7</sup> That is why young people should think carefully before they decide to go to university. If it does not work out they should decide as soon as possible to rather discontinue their studies. There comes a point when it is no longer about maximising the return on the investment, but *minimising the loss* on the investment. Naturally this is not so simple. Some people (like Thandi in our story) take longer than others to get on course. Some people realise they should rather follow another course and eventually complete it with great success. Others, like Rashid, only find their feet later and their perseverance is admirable. It pays to see the student advice office that each university has, as a source of investment advice – advice which should be obtained as quickly and regularly as possible.

## WHAT DO UNIVERSITY STUDIES COST AND WHO PAYS FOR IT?

Up to now we have only spoken very generally about the cost of university studies. Now it is time to get more specific. What we are interested in is what the cost is for the student, in other words, after the government's contribution has been subtracted. Here we will focus on the cost for a student who enrolls at a university for the first time.

Something we must keep in mind is that over the last ten to twenty years the government (and therefore the taxpayer) in South Africa, as is the case in most countries in the world, has been contributing an ever decreasing part of the cost of university studies. In the same 2006 report by the South African Council on Higher Education to which was referred earlier, it shows that for example the Dutch government, having contributed 84% of the total income of the country's universities in 1985, reduced its contribution to 69% within six years<sup>8</sup>. This in part reflects the changing view of the role of the government in the financing of higher education. The basic argument is that the education or training of individuals in a community holds many benefits (so-called externalities) for the community as a whole. Therefore it is justified that the broad public (via taxes) make a contribution to the cost of education.

The argument goes on to say that the better the individual's prospects are to earn a good income as an economically active member of the community,

the bigger the contribution is that he or she can make towards the cost of his or her education.

Because the investment in university studies is seen as one that delivers a yield to the individual during his or her lifetime, the government argues that the individual should make a relatively bigger contribution. To put it plainly, the case for “free” education for a learner in grade 1 is stronger than for a doctoral student.

The above-mentioned 2006 report on the impact of changing sources of financing for higher education indicates an alarming phenomenon with regard to government spending on higher education in South Africa as a percentage of the total value of production in the country (economists use the term “gross domestic product”). This percentage was lower than the average for a group of 84 countries (scattered over all six continents) which were studied. South Africa did worse than the average value of the 15 African countries that were included. For a country from which a lot of leadership and success is expected in the area of economic development in Africa, and in light of the high demands for expertise set by the knowledge economy, data like this surely calls for reflection. At the time when this book was finalised, there was a growing advocacy for the necessity of bigger government investment in higher education in South Africa.

The relatively smaller government contribution to the financing of higher education is an important reason why today it costs a student a lot more to study at a university than before. The cost consists of different elements; some of which can be found in the universities' yearbooks. As a matter of interest an example of the cost of tuition for a three-year BA degree at the University of Stellenbosch for the following years are included in table 2: 1911 (the year after the establishment of the Union of South Africa), 1946 (the year after the end of the Second World War), 1961 (the year when South Africa became a republic and the year the South African rand replaced the British pound as currency), 1977 (the year after the Soweto uprisings), 1995 (the year after the new constitutional dispensation was put into operation) and 2006. The figures in the table are exactly as they have been quoted in the yearbooks and don't take into consideration that at different times different smaller cost items have been included and excluded from the price. Take note that these fees defray the cost of academic teaching as well as certain support services delivered by the management and administration of the university. In the third column the tuition fees are shown in 2006 values. Keep in mind that inflation has caused the value of a South African coin or note to decrease a lot in the last nearly 100 years. Things that today will cost you R100 would have cost you just 75c in 1910!

<sup>7</sup> Department of Education. 2005. *Student enrolment planning in public higher education*. Pretoria.

<sup>8</sup> Steyn, G. & De Villiers, P. 2006. *The impact of changing funding sources on higher education institutions in South Africa*. Research report of the Monitor for Higher Education. Pretoria: Council on Higher Education, March.

**Table 2: Tuition fees, University of Stellenbosch, selected years<sup>9</sup>**

STUDY YEAR	TUITION FEE FOR FIRST YEAR OF THREE YEAR BA-DEGREE	COST IN 2006 PRICES <sup>A</sup> (R)	AV. ANNUAL INFLATION RATE BETWEEN YEARS INDICATED	AV. ANNUAL INCREASE IN TUITION FEES BETWEEN YEARS INDICATED	FACTOR BY WHICH TUITION FEE IN 2006 WAS MORE EXPENSIVE THAN SELECTED YEAR
1911	£17	4 556 <sup>β</sup>	1,7	0,04	3,2
1946	£31	4 616 <sup>β</sup>	3,5	-0,8	3,2
1961	R92	4 109	6,0	9,8	3,5
1977	R410	7 229	13,3	15,5	2,0
1995	R5 440	10 069	5,9	9,3	1,4
2006	R14 391	14 391	5,3 (1912–2006)	6,6 (1912–2006)	-
			8,8 (1962–2006)	11,8 (1962–2006)	

<sup>a</sup> The 2006 value was calculated by adapting the cost with the annual inflation rate as measured against the official consumer price index with regard to metropolitan areas for updates.

<sup>β</sup> When the South African rand replaced the British pound as currency, £1 was equal to R2. This exchange rate was used for the years before 1960.

With reference to the quoted tuition fees for a standard BA degree at the University of Stellenbosch (excluding the extra cost of books and notes), the most important observation with regard to table 2 is that the private cost for higher education has consistently increased faster than the inflation rate. During the whole period between 1961 and 2006 *the tuition fees annually*

<sup>9</sup> Sources: South African Reserve Bank. 2006. *Kwartaallikse bulletin*. Pretoria; Statistics South Africa. 2005. *South African Statistics*, 2004/05; Stellenbosch University (selected years). *Jaarboek*. Stellenbosch.

*increased on average with 3 percentage points more than the inflation rate.* In 2006 this programme was 3½ times more expensive than in 1962; not much different from the ratios in 1911 and 1946. These observations provide quite a good account of the cost pattern with regard to higher education in general. If this trend continues it means that any financial planning in order to make provision for future studies, should allow for the possibility that the cost of studying for the individual will rise much faster than projected inflation.

Tuition fees differ at different universities, just as there are different terms that are used to refer to costs. Other terms that are also used are “class fees”, “programme fees”, “study fees”, “course fees” and “module fees”. As befits a market-based economic dispensation, the government does not apply price determination or price control with regard to tuition fees. From time to time you do hear threats of it happening and there are organisations and interest groups asking for it, but at the time this book went to press, university councils in South Africa were still responsible for determining their own tuition fees. So can universities charge as much as they want? Definitely not. Factors countering exorbitant increases in tuition fees include the fact that universities compete against one another as well as the bargaining power of students and student organisations.

A degree programme like BComm or MBChB consists of modules and at most universities the cost is calculated by adding up the “prices” of the modules. There are also differences in the “price” of a degree programme (the tuition fee) as it appears in university yearbooks because some universities include all costs while others recover it separately. The latter costs include items such as study material, study-related transport, laboratory fees, books and computer facilities. When the costs of study at different universities are compared, it is important to determine what additional costs must be added in. The University of South Africa is the cheapest because distance teaching costs less than contact teaching (because residential universities must and maintain build lecture rooms and laboratories and need more lecturers relative to the number of students).

The tuition fees are the greatest single cost item, but of course by far not the only one. There are the cost of prescribed books that you have to buy yourself at bookshops, accommodation costs, the cost of membership for societies and sport clubs, etc. Most universities allow other university-related costs besides tuition fees to be added to the student’s account. In most cases that university’s account is sent to the parents who pay it according to the payment method arranged with the university. In order to give an indication of costs and their relative extent, table 3 contains the percentage share of the different cost items which appear on the account of students in university accommodation at Stellenbosch

University (the percentages were calculated as the average for all students over a period of the three years 2003-2005). It is notable that study-related expenses only amount to a little more than half (53%) of the total expenditure.

**Table 3: Share of different cost items on study account**  
Average % for students at Stellenbosch University, 2003-2005

CATEGORY	COST ITEM	% OF TOTAL
STUDY-RELATED EXPENSES (53,1%)	Tuition fees	47,3
	Material costs	2,1
	Handbooks (only those bought directly via the university)	1,3
	Photocopies and printing	1,2
	Internet access	0,8
	Study-related travelling	0,2
	Laboratory fees	0,2
	Subtotal: study-related expenses	53,1
ACCOMMODATION (45,4%)	Accommodation fees	36,3
	Meals	8,6
	Other (e.g. washing)	0,5
	Subtotal: accommodation	45,4
CULTURE, SPORT AND RECREATION (1,2%)	Society fees	0,4
	Sport membership fees (including gymnasium)	0,8
	Subtotal: culture, sport and recreation	1,2
OTHER (0,3%)	Diverse items	0,3
TOTAL		100,0

There are of course many expenses besides those which are added to the student's formal university account. There is the cost of transport to and from the parental home. Pocket money, stationery and medical costs are further expenses. Besides this, students sometimes find a number of hidden costs which are brought about by association with a group, such as outings and events, even clothes bought due to peer pressure for the sake of group identity. The transport costs for students who do not live in university accommodation are generally also much higher.

Due to differences between universities it is not meaningful to provide estimations of true costs. Table 4 can however be used as checklist for the reader's own calculations based on the information supplied by the concerned university.

**Table 4: Calculating the cost of university studies**

EXPENSE CATEGORY	ITEM	AMOUNT (FILL IN YOURSELF)	% OF TOTAL (CALCULATE FOR YOURSELF)
STUDY-RELATED EXPENSES	Registration fees (if applicable)		
	Tuition fees (the university yearbook's cost for the programme [or modules] registered for)		
	Prescribed books		
	Study material		
	Laboratory fees		
	Photocopies		
	Travel costs related to tuition		
	Computer fees (including internet access)		
	.....		
.....			
ACCOMMODATION	Accommodation fee (university or private accommodation)		
	Meals		
	Residence fees		
	Other (e.g. events, washing)		
	.....		
	.....		
CULTURE, SPORT AND RECREATION	Membership fees for societies		
	Gymnasium		
	Outfits and equipment		
	Other (e.g. events, transport)		
	.....		
	.....		

MEDICAL	Student health services <sup>a</sup>		
	.....		
COMMUNICATION	Cell phone or telephone expenses		
	.....		
STATIONERY			
COMPUTER AND RELATED ITEMS (IF APPLICABLE)	Expenses related to use of own computer (if applicable), like paper, ink for printer, repairs		
TRANSPORT	Expenses related to use of own car (if applicable), like insurance and maintenance		
	Travel fees		
	Parking <sup>β</sup>		
INSURANCE	Car		
	Other equipment		
	Personal casualties <sup>γ</sup>		
FINANCING COSTS	Interest on loans		
POCKET MONEY <sup>δ</sup>	Diverse <sup>ε</sup>		
.....	.....		
.....	.....		
TOTAL			100,0

<sup>a</sup> In cases where a student uses health services supplied by the university, it will appear on the student's account.  
<sup>β</sup> In most cases you will have to pay for a permanent parking space for a car.  
<sup>γ</sup> Take note that the conditions on which students enrol at universities probably entail that the students themselves are responsible for the cost of personal casualties. Some students therefore prefer to take out insurance for it.  
<sup>δ</sup> Depending on the agreement between the student and his or her financier, pocket money can cover a large number of things, such as personal care, clothing and shoes, movies, food and drink, et cetera.  
<sup>ε</sup> When students do not make use of university accommodation, items such as accommodation fees, house fees, meals and washing will be replaced with rent money (for a room or apartment), groceries, cleaning services (if applicable), extra transport (if the student cannot walk to class), etc. If all these items are added to pocket money, the amount will be much higher than if they are listed separately.

## HOW CAN A STUDENT FINANCE THE COST OF HIS OR HER STUDIES?

Very few students are in the privileged position that they (or their parents) can pay cash for their studies and that they are able to start their career without any study debts. *What sources of financing are available for students whose parents, family or friends cannot pay for everything?* Aside from own funds (such as money that is earned by the person him- or herself) there are two basic sources: bursaries or donations and loans.

*Bursaries* are available on the grounds of several considerations and from different organisations or institutions. Schools give bursaries to top students and universities also make large amounts available in order to recruit proficient students on the grounds of their achievement *before* they come to the university. Some universities offer the benefit of free study in the first year or more; while others offer bursary money as a set amount for one or more years of study. Some bursaries are large enough to even cover accommodation costs, or part of it. Universities also offer bursaries to students on account of their achievements *after* they have joined the university, in other words on account of their *university achievements*. Many of the bursaries made available by universities are comprised of money that has been received from benefactors or bursaries offered by potential employers. The latter is usually accompanied by preconditions to go and work for the provider of the bursary or to pay back the bursary in the case of a breach of contract. In most cases students find that bursary money does not cover all their expenses and they then supplement it with study loans for example.

The university's core business is providing academic services and not financial services. Universities however do offer study loans for which a repayment agreement must be signed. Usually the parent or someone else must stand surety for the repayment. Often a so-called means test is used to ensure that the university preferably makes loans available to people who cannot obtain money so readily from private institutions like banks. Some bursaries are connected to specific activities, for example sport; others are for certain fields of study (for example engineering). Most universities provide certain bursaries only to people from previously disadvantaged communities as an integrating element of their diversity strategy. Any university's bursary office will be able to provide more details, usually in the form of a booklet that contains all the bursary information.

Since 1991 the government also has a *bursary and loan scheme* known as NSFAS (*National Student Financial Aid Scheme*). It is managed by an organisation which has been established specifically for this purpose and which uses universities as agencies. Applicants must be South African citizens. They can qualify for NSFAS bursaries if they:

- are registered at a South African university;
- study for a first educational qualification (or a second qualification if it is necessary for practicing the chosen occupation);
- have the potential to achieve academic success; and
- do not have the financial means at their own disposal.

NSFAS provides loans at low (subsidised) interest rates with a repayment plan for when the person starts earning a salary. No guarantees are required. The scheme also rewards success by remitting a percentage of the study debt if and as certain modules are passed. The maximum debt relief of 40% is realised when a student passes all the modules of a degree programme. In reality the student can therefore determine for him- or herself how big the financial bursary component of the initial loan will be. More information is available from: NSFAS, Private bag X1, Plumstead 7801, by e-mail to [info@nsfas.org.za](mailto:info@nsfas.org.za), online at <http://www.nsfas.org.za>, or telephonically at 021 763 3200.

Different countries have different forms of study help. From the mentioned 2006 report on the impact of changing sources of financing for higher education it appears that Australia for example has a government scheme according to which students start repaying their higher education fees when they enter the job market and start to earn more than a certain amount of money. It therefore comes down to an interest-free loan which must be repaid. In some countries study loans are paid back via the tax system.

Loans for university students are also available from *private financial institutions*. Most of these institutions have offices or agencies on university campuses and provide loans at relatively favourable interest rates with repayment that usually starts when the student starts working. As a rule banks require some or other form of security. Universities are usually helpful in bringing students and/or their parents in contact with these institutions.

## PRACTICAL ADVICE

Keeping the cost of studying as low as possible (and therefore maximising the yield of the investment) requires careful planning of your studies and the most favourable way of financing. There are also several practical issues that make the financial management of this investment a lot easier and more cost-effective. The best way of discussing it is by answering a few frequently asked questions.

**When must what be paid?** *Different universities have different payment arrangements, but in general the following applies:*

- An application fee which must be paid when the student's application is handed in (usually before a certain date in the year preceding the first year of study). The application is meant to cover the cost of processing the application and is usually not refundable if the application is unsuccessful.
- A non-refundable deposit or admission fee, which can amount to 20 to 30% of the tuition fee and which a university views as money to cover a student's administration cost.
- The rest of the tuition fee, which can be paid once-off or in instalments over a period of time.
- Accommodation fees for which a deposit is required when applying and of which the rest is paid in the same way as the tuition fee.
- Society, club or gymnasium fees of which the method of payment will differ, with many universities allowing it to be debited against the student's formal university account.

Depending on the payment facilities of the university, university accounts can be paid with cash, by cheque, by debit order or electronically. If students receive loans or bursaries from institutions outside the university, it is usually arranged that the money be paid directly into the student's account.

**What about banks?** Banks are quite keen to open accounts for students. After all, it might just be the account of a rich future businessman or -woman who might choose to stay a client at that bank for the rest of his or her life! Students have a choice between cheque accounts, savings accounts, credit cards and debit cards. It pays to compare the costs before making a decision. When a loan facility is linked to an account, it can be expected that the bank will require a guarantee.

**How do you pay for all kinds of necessities?** Necessities such as books, stationery, medicine and pharmaceutical products, groceries and clothing can

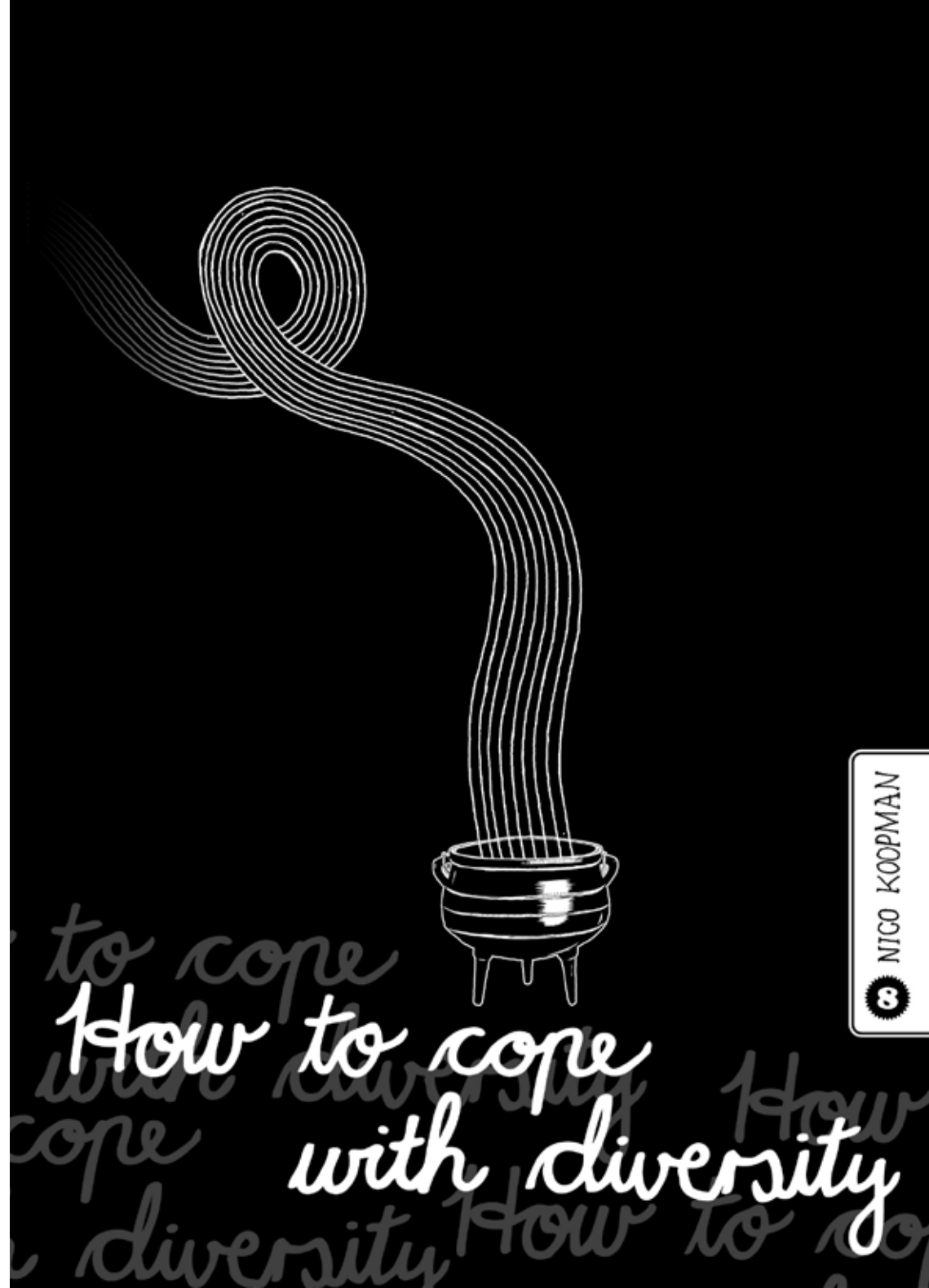
be bought cash or with a credit or debit card or you can open an account at the shop or business. In many cases such businesses are available on or near the university campus and are well equipped to open student accounts (with or without the parents being present) at the beginning of the year.

**Does a student get prohibited from further studies if tuition fees get in arrears?** Many universities give a cash discount if the year's tuition fees are fully paid before a certain date. Otherwise the payment method comes down to a mixture of advance payment and pay-as-you-go. The teaching service is thus performed without asking for a payment guarantee, except in the case of a loan contract. The only fall-back option that a university has in order to ensure that students meet the financial obligations is to withhold results if payment is in arrears. Students are generally also not allowed to register for a new study year if their account is in arrears. Where possible universities are willing in special cases and with the application of means tests to offer bridging financing or loans at the beginning or a new year or when awarding of the student's degree is in question. Some universities are even willing to write a letter to the prospective employer stating that the graduate has met all the requirements in order to receive the degree certificate, but without giving the certificate to the student. That enables the student to start earning an income in order to pay back outstanding debt. This practice however is not without risks for the university and is therefore not always met with approval.

**How can university studies be made more cost-effective?** Lastly, here are a few tips which can help to stretch your rand – and therefore make the dividend on your higher education investment even bigger:

- Look out for hidden costs (social events, outings, cost of peer pressure, sport) and avoid them if you have not budgeted for them.
- Bear in mind that university life offers many tempting activities which appear much more attractive than attending classes and studying. Of course recreation is very important, but so is a balanced life. Point is, if you want to maximise your educational investment, none of these things, however much their value, can replace a university qualification. To study is expensive. To fail is even more expensive.
- Make arrangements if your parental home is far from the university. A lot of money can be saved if two, three or even four students travel together. When student activities take place during long holidays, plan things so the shortest (and therefore cheapest) route to your parental home is possible.

- You can save a lot by buying good second-hand books (rather than new ones). Make sure the book you buy is the same edition as the one prescribed. Most handbooks are revised every three to four years after which a new edition is released.
- If you make use of a credit card or cheque account, schedule payments so your banking fee, transaction fees and interest are kept to a minimum. The same goes for accounts at shops or businesses.
- Budget for pocket money, keep book of all expenses and check regularly that you do not exceed your budget.



 NICO KOOPMAN

***A university that wants to expand knowledge and develop theories which serve the current pluralistic local and global societies cannot consist of a group of similar people. For the thorough and effective practise of science and knowledge expansion, a diverse combination of people is necessary.***

## **DIVERSITY HELPS US UNDERSTAND OUR WORLD BETTER**

We live in a world with a rich diversity of languages, cultures, religions, socio-economic and political groupings, genders, sexual orientations, age groups and even levels of disability. This diversity especially concerns matters such as diverse worldviews, views of people, ideas of rationality and value systems, and it is applicable to all subject fields.

*Women* help to expand the dominantly androgynous, male and businesslike approach to scientific character. During the past few decades female thinkers have enriched the scientific practice with the focus on the narrative and scientific character, the affective and scientific character, participation instead of just so-called objective observation and scientific character, vision, imagination and the aesthetic and scientific character.

Exposure to *poor people* has made a worldwide impact on our theories, not just in the economy, but also in theology, law, engineering, computer science, information technology, et cetera. The participation of *homosexual people* in the scientific conversation definitely has a determining legitimate influence on our theory-building in the philosophy, ethics, and gender and legal studies.

Participation of *people from non-Western cultures* helps us to bring in conversation with each other among other linear and cyclic views of time, and objective and subjective rationalities.

The pertinent attention to *disabled people* during the past decades has helped us a lot in reviewing our theories in different sciences in the light of an anthropology or view of people of fragility and interdependence. These thoughts on fragility and tragedy don't only take place in theology, philosophy and health sciences, but also in political and economic sciences. The latter two disciplines work within the context of political and economic globalisation respectively with big emphasis on political and economic interdependence.

Where all these forms of diversity form part of our scientific search for knowledge, we make progress on the road to better understanding of our world in order to create a better life for all.

## DIVERSITY CAN GO WRONG

In the past we didn't always appreciate diversity or treat it well. We were under the impression that diversity and harmony were irreconcilable. *Diverse and separate* was often our password. Separate was also synonymous with inferior. Those who were different to us were seen as inferior.

It is so important that we learn to appreciate diversity, to not be threatened by it, to not handle it as negative, but to accept and enjoy it as a gift. We are motivated by our beautiful motto on our country's coat of arms, in the indigenous Khoi language: !ke e: /xarra //ke – unity in difference, unity in diversity. If universities, where so many knowledgeable people are together, can't learn to handle diversity positively, then the chances for the broader society are even smaller.

### From racial diversity to racism

In our past South Africans didn't handle diversity well. With regard to racial diversity, among others, we have a bad record. We changed racial diversity into racial separation, racial alienation, racial hostility, in short, racism. Racism has three parts. Firstly the negative idea that one race has of another. The second part is the societal structures established because of this negative idea. Lastly there is the religious justification of this idea and the supporting structures.

**Racist ideas.** The word "ideology" is derived from the Greek word *idein*, which means "to see". The ideology of racism refers to a negative view that races have of each other. The history of the development of modern racism in Europe since the Renaissance and later the Enlightenment indicates that white European races saw other racial groups as inferior. This classification of races in terms of superiority and inferiority takes places on the grounds of criteria such as intelligence, morality, general civilisation, hygiene and physical appearance including skin colour, facial form, nose size, hair texture and build. The classical Greek man was seen as the ideal person, and the orang-utan as the other extreme on the scale of humanity, as the subhuman.

Three big racial groups are classified in terms of alleged inferiority and superiority. The Caucasians, the white races originally from Europe and North

India are the closest to the ideal man. The Mongoloids, the races from Asia are second in line, and closest to the orang-utan are the Negroids, the black racial groups originating from Africa. Some anthropologists add a fourth racial group, the Australoids, the indigenous groups from Australia, which are ranked just above the Negroids. Where previously the word "race" was only used as a distinguishing and descriptive category, it has become polluted due to this acceptance of the different levels of humanness of the different racial groups.

In apartheid South Africa we find a form of the earlier version of racism. The European picture of superiority and inferiority was propagated in our country. The picture of inferiority and superiority with regard to racism was expounded in South Africa, just like previously in Europe, and repeated so much that people didn't think about it on a conscious level anymore, but that the picture was absorbed and assimilated right down to the subconscious level. That meant that people were no longer even really aware that they had such a picture, attitude, prejudice and preconceived idea with regard to themselves and other races.

The following words that we innocently started using, demonstrate the presence of the racist picture in our subconscious. The tragedy is that it wasn't only races who wanted to propagate the inferiority of others who assimilated this picture in their subconscious. So-called inferiority groups also live with this picture of their so-called inferiority and the alleged superiority of other groups and have accepted it subconsciously.

The following are examples of words which imply superiority and inferiority:

**Non-whites:** White is the norm in terms of which other groups are defined.

**Disadvantaged:** The impression is created that Coloured, black and Indian people to which this term often refers, are disadvantaged with regard to work ethics, intelligence and lack of other skills, while the white race, who are seen as superior in terms of work ethics and intelligence, have prospered.

**Diverse students:** All Indian, coloured and black students on some campuses were called "diverse students". Here the subconscious prejudice betrays the fact that white is the norm and that everything else is judged according to that. If Indian was used as norm, the white student, seen from that angle, would also have been a "diverse student".

The uncritical use of terms like these by black, Coloured and Indian people reflects the assimilation of the racial picture on the subconscious level. Even people from different racial groups whole-heartedly against racism, underestimate the contaminating effect of centuries-old racism when we deny these subconscious racial pictures in our own minds. Something that further contributes to the underestimating of racism is the fact that these subconscious

prejudices and attitudes don't always embody crude forms, but rather have nearly unrecognisable, subtle forms – that therefore don't hurt as much and is less destructive.

**Racist structures.** On the grounds of the racist ideology, white, Indian, Coloured and black people were categorised in terms of superiority and inferiority. Societal structures have been erected according to this human dignity barometer. During the last decades of colonisation and since the beginning of apartheid, laws have been accepted which had to help give this racial picture concrete form in the broad society. Apartheid, as the political embodiment of racial images and prejudices, had been practised since 1948.

The Population Registration Act determined to which racial group you belonged. The Act not only often divided families, but also indicated what level of human dignity you had.

The country's acts from early in the twentieth century and the Group Areas Act of the fifties determined that only white people could own property and have first choice of the best areas in South Africa, in other words the areas with mineral riches, fertile soil for agriculture, favourable weather conditions and beautiful natural scenery.

The Mixed Marriages Act and Article 16 of the Immorality Act prohibited sexual contact and marriages across racial lines. It was especially applied to relationships between white people and other groups. It was less strict with regard to the "mixing" of other groups. These three sets of acts were the pillars of the so-called macro apartheid. It determined your human dignity, indicated where you may own a home, where you may live and even who you may fall in love with.

Several other acts were formulated on the grounds of the above. These acts determined which entrance you were allowed to use at government institutions like post offices, on which trains you were allowed to travel, where you could receive health care, where you could spend your free time, at which beaches you could swim, and where you could study, in which field and up to which level you could be trained and in which political processes you could participate.

The awarding of government money, training and job opportunities to different racial groups were done in terms of this racial categorising of people. Supporters of apartheid pretended that apartheid was only about separateness. But this policy was not just about forced separation. Apartheid's thoughts and practices were based on the separateness, irreconcilableness and especially the inequality of people from different racial groups. Racial measures like these have contributed to the socio-economic inequality that today still runs mainly along racial lines.

**Racist religion.** It is sad that religion is often used to legitimatise ideologies and pictures. The history of the world is rendered filthy with examples of this. The so-called apartheid theology has since the first decade of the twentieth century explained away the picture of racial prejudice described here. The message was simple: Deep down the picture of racial inferiority and superiority is not something invented by man, but comes from God. The unfair and dehumanising structures formed on the grounds of this picture are an expression of obedience to God. The existence of separate churches further supported this ideology. There is general consensus among historians that the church apartheid in especially the so-called Dutch Reformed Church family has given momentum to apartheid in society.

The threefold manner in which racial diversity led to racial separation and racial alienation helps us to explain the destructive handling of other diversities. At the same time a good understanding of where and how we went wrong shows us the way toward satisfactory and lasting solutions.

### **From class diversity to classism**

Within the same colour groups and across colour lines subconscious pictures of different socio-economic groups are created and assimilated. As with racism social practices are developed that reflect these pictures. Consequentially the level of income determines with how much respect and deference people are treated and where people live, study, relax, are treated, go to church, die and are buried.

Naturally equivalence doesn't mean that all people are absolutely equal and can lay claim to identical standards of living. It however also doesn't mean that those who have less possessions, literacy, et cetera are inferior and condemned to an inferior life. It also doesn't mean that the systems must be left unchanged in the face of a growing situation of abundance for a minority and glaring wants for a majority.

### **From gender diversity to sexism**

In the anti-apartheid struggle in South Africa there was fought against three big evils, namely racism, classism and sexism. It is however clear that sexism hadn't generally been contested with the same dedication and passion as classism and especially racism. As in the case of racism and classism, sexism is also about ideas of superiority, in this case of men compared to women, as well as through social structures that embody these ideas. Religious legitimising of

the sexist pictures and structures are even more obvious than that of racism and classism.

In nearly all ethnic and cultural groupings in South Africa the ideological picture with regard to women is one of inferiority. The argument is that women don't comply with the modernistic characterisation of individuality, autonomy, rationality, independence, balance, healthy emotionality, efficiency, et cetera. Therefore they can only receive positions of submissiveness. These images are often not explicit, but subtle. And as is the case with racism and classism, these images usually function on a subconscious level.

It is not difficult to indicate how this picture of women's inferiority is embodied in social structures. The representation of women in leadership positions in different sectors of society for example is still unacceptably low. Attempts are made in several sectors of society to rectify this injustice. However, the levels of gender injustice are still very high.

As is the case with racism, religious legitimising is provided for women's position of inferiority. In the Christian tradition for example, as with several other religious traditions, a long history of prejudice against women can be found. By referring to the Bible and gender practices in the church history of two thousand years, some Christians legitimise the inferior position of women. Responsible current-day Christians however feel that these ways of thinking should be rejected and that the Bible and church tradition must urgently be revalued in this regard.

### **From diversity of sexual orientation to homophobia**

The reality of a diversity of sexual orientations in our world has also been idealised. This picture is assimilated on subconscious level and also has subtle embodiment. However, it probably has more crude forms of expression than those other destructive treatments of diversity. Regular testimonies are also found of discrimination against and exclusion of homosexual people in the workplace and other sectors of society.

Although we must leave room for supporters of the same religion to have different views on homosexuality, it is unacceptable to try and religiously legitimise homophobic ideas and homophobic social structures and practices.

### **From diversity of age to ageism**

With regard to diversity of age there are also pictures of alleged inferiority and superiority. Some ageist pictures indicate that young people don't meet the normative characterisation of expertise, wisdom, achievement, intellect, autonomy and independence. They are isolated and excluded from the structures of influence and authority. These pictures often receive sanction with a call on, among other things, religious directives of respect for elders. This form of ageism is usually found more often in the more traditional societies.

In modern societies older people are more often the victims of the pictures of ageism, in other words, discrimination on grounds of age. They allegedly don't comply with the requirements of the modernistic characterisation of virility, creativity, energy, innovation, production, consumption, independence and achievement. As a result older people are gradually being elbowed out of positions of authority and leadership. Statistics in South African workplaces suggest a tendency where more and more younger people are appointed in senior positions at the expense of older people who allegedly don't meet the criteria of the ideal modern-post modern person. Some people even try to find religious justification for these ageist pictures and structural practices. Among others the prominence of young people in Biblical stories is used in an unacceptable way in this regard.

### **From diversity of disabilities to handicapism**

In a society with a dominant characterisation of independence, rationality, individuality and pressure of achievement become pictures of the inferiority of disabled people.

The inadequate admission of disabled people in leadership roles in different sectors of society demonstrate there is acted under the picture of inferiority of disabled people. The provision made to meet the special needs of disabled people in terms of aspects like friendly structures of buildings and adequate resources and training in the workplace reflects the similarly subtle view that less is expected of disabled people than so-called normal people. Special regulations to help them realise their potential is therefore redundant, because according to the subtle, subconscious reasoning they don't really have a lot of potential.

There are even attempts to give religious legitimising to handicapism. These attempts truly occur less than in the case of racism, classism and homophobia. Still the challenging interpretations are heard in extreme cases that diseases and

forms of continuous disability is due to the person self, or that of the parents or the broad society.

People who are HIV positive embody a form a disability that requires special attention. The intuitive response on the news that somebody is HIV positive too often is one of promiscuity. These pictures of a connection between promiscuity and a positive HIV status, as well as other forms of prejudice, interfere with the structural care of such patients in our communities.

### **From diversity of nationality to xenophobia**

Besides the threefold statement for the wrong handling of different diversities, the economic factor must also be taken into account. The competition for scarce sources aggravates the existing prejudices and wrong forms of discrimination. It becomes especially clear in the conflict between black and Coloured people. Their bigger business skills and access to capital worsens the existing discrimination against people and especially against other African countries. The competition for scarce resources therefore aggravates xenophobia.

People can surely indicate how other forms of diversity can be handled negatively in this threefold way. An example of this is the human-nature diversity which leads to the destruction of the natural environment (*ecocide*) because people can make an appeal to religious considerations and be seen as superior to the rest of creation.

### **From Africa diversity to Afro-pessimism**

Africa is a continent with rich diversity. However, we often handle this diversity wrongly. Some Africans even function with the prejudice that Africa is inferior; and even ask questions about Africa's levels of moral and religious development. We often hear the accusation that Africa hasn't contributed anything to the world's technological and scientific development – as if people don't know about the development of mathematics in Egypt and the scientific contributions of the African city Timbuktu with its large library. South Africans betray our subtle, subconscious prejudices towards Africa when we so often refer to other African countries as African – as if we're not really part of this continent.

### **From diversity of religion to religious conflict**

The growing influence of religions in international and local conflicts – among others in countries like the Netherlands that are experiencing increasing

religious diversity – also indicates that diversity of religion is handled in this threefold way. Some religions are seen as superior in comparison to others; structures and regulations in society judge such religions appealing to the alleged larger sophistication of the religious and morals contents of that so-called superior religion.

## **DIVERSITY CAN BE ENJOYED!**

The subconscious pictures that we function with must not be underestimated. They really exist, but function on subconscious level. They subtly and spontaneously determine our conscious thoughts and actions. We mustn't underestimate these pictures. They don't have to paralyse us. In the same way that the diagnosis of a disease helps us to treat it and bring healing, the recognition and acknowledgement of our pictures can also help.

***We must guard against both oversensitivity and insensitivity.*** Victims of discrimination can often see racism, sexism, et cetera where it doesn't exist. Even worse, they can even turn their backs on the alleged racism, sexism, et cetera in order to reach certain targets. Those favoured by certain forms of discrimination must guard against insensitivity and a too comfortable accusation of victims of oversensitivity and abuse. In the situation of correction the voice of the suffering party must weigh heavier, until the contrary, namely that it concerns oversensitivity and abuse has unquestionably been proved.

Transformation is necessary in order to treat diversity differently than in our apartheid past: transformation of our incorrect pictures, prejudices and stereotypes of others; transformations of the societal structures that reflect these pictures; and transformation of religious convictions that legitimise these pictures and structures. The development of interpathy between different groups is necessary for this transformation process, for this striving to diversity and togetherness.

In his book *Pastoral counselling across cultures* the American theologian distinguishes between sympathy, empathy and interpathy<sup>10</sup>. It helps us in the necessary transformation and renewal of these polluted pictures, structures and religious ideas. *Sympathy* refers to the spontaneous, affective reaction on the circumstances of people and their emotions in these circumstances. It is about people that correspond with me on many levels, among other colour, class, gender, sexual orientation and age. It means to spontaneously

10 David Augsburger. 1986. *Pastoral counselling across cultures*. Philadelphia: Westminster John Knox Press.

feel with other people who have a lot in common with me, people who form my inner group.

*Empathy* has to do with the conscious, affective reaction to the circumstances of people who have a lot in common with me as well as people who differ from me in many regards. Empathy is to “penetrate into someone’s position” and in that sense climb into their skins.

*Interpathy* goes even further. It especially has to do with people who belong to totally different groups than I do. I am not only affective, but also consciously involved with them in a cognitive way. Interpathy refers the conscious cognitive and emotive visualising and understanding of the circumstances of people from a different race, class, gender, sexual orientation, level of disability, age group and nationality.

Interpathy means to climb into the skins of people from other cultural groups; to learn to understand their circumstances, their interpretation of reality, their version of the past, their understanding of the truth, as well as the emotions that their circumstances awaken, among others anxiety and fear, pain and anger, guilt and shame. This imagining requires personal meetings and exposure, but also relevant reading and rational reflection about the life-reality of others; about their culture, habits and customs; about the impact of social, political and economic systems on others. Reading about life in an informal settlement, or a so-called squatter camp, can help with imagining the life of the people who live there. Reading and thinking about the effect of the authoritative structures of authority of apartheid on younger and middle-aged white Afrikaans speakers can help a lot to imagine ourselves in these people’s positions. Reading and thinking about the sad stories of oppressed women and homosexual people help us on the road to interpathy as the conscious imagining of others’ positions. Imagining other people’s position is indeed interpathy. It not only helps us to understand others better, but also to understand ourselves better. It helps us to get an idea about what others think of us.

*Interpathy, however, doesn’t come easily.* People from different groups don’t spontaneously climb into each other’s skins. They don’t understand each other intuitively. They don’t automatically share each others’ feelings. In a society like South Africa, where people were estranged from each other for so long and were hostile and apathetic towards each other, it is even less the case.

To develop interpathy that opens the door to enjoyable living with one another, spaces must be created where people can learn to climb into one another’s skins. These spaces are places where people can listen to one another’s stories; can experience one another’s emotions of pain and anger, fear and anxiety, guilt and shame; even courageously place their stereotypes on the table.

These spaces are actually abnormal. As normal human action people should be able to live in one another’s skins, understand one another and feel with one another across numerous lines. Our history has taught us however that it doesn’t happen normally and spontaneously. Now we must use abnormal means to achieve the normal. Hopefully these conscious, structured, unspontaneous, abnormal ways of developing interpathy teaches us to live interpathically in a normal, spontaneous way.

Besides opportunities for directly talking to one another, we can also examine additional ways to develop interpathy. Visit with one another, get to know one another’s worlds; eat together, watch rugby together at Newlands and soccer in Soweto; undertake joint projects; read appropriate literature about one another, like dramas, poems and novels; get to know one another’s music, customs and habits. Spaces for interpathy indeed teach us important skills for a life of diversity and togetherness.



# 4. MAKING YOUR WORLD A BETTER PLACE

# Why you should take the lead



***Leadership emerges in a context of angst or restlessness as people come to terms with the realisation that the current state of affairs ought to change and that there are risks that accompany any change. More than a decade after the first all-race elections in South Africa, there is angst within all communities about how to manage and navigate the changes that are generally celebrated as positive in the country.***

Universities in South Africa have been part and parcel of the history from which the country is either emerging or agitating to regain. This is so because education, to all intents and purposes, is a framework in which adult members of communities pass on their accumulated knowledge and experiences, and instruct, formally or informally, the younger ones regarding the habits of living decent lives in relationship to other members. Education is more than mere literacy and numeracy: it also deals with conveying values and habits in order to guarantee that the communities continue to reproduce themselves. It also encompasses the passing on of the knowledge which teaches the young members how they fit into the broader schemes of human lives, and also about their leadership roles in their given communities.

Institutions of learning are part of these communities and can therefore not operate outside of the milieu of a given period and the power conflicts and contradictions of that time and place. It is in this context that students has the responsibility and opportunity to develop and act as leaders

## **STUDENT LEADERS CAN BRING MEANINGFUL CHANGE**

Throughout the world, students have historically played significant roles in socio-political change. Here an immediate distinction must be drawn between students and youth. Youth has to do with age (those between 1 year and 35 years in post-apartheid South Africa), whereas students are an assemblage of young and not so young people engaged in the activity and praxis of exploring knowledge, ideas and phenomena for the purposes of improving the human condition. There are a number or reasons why students are in a strong position to be leaders.

1. *Students* are members of their communities who are in the privileged positions of receiving higher education. *As such, students are located in the world of ideas, the universe of inquiry, the domain of investigation and of knowledge itself.* The youth are there by virtue of falling within a politically-defined age category with very little choice in the matter. Students enjoy some degree of choice to attend university and to study in particular fields.

2. *Student communities are recipients of the value systems of the times in which they live, but are at the same time has the opportunity to distance themselves from these value systems.* Such is the history of student activism in South Africa in the hey-days of apartheid when black students were almost compelled to act. At that time, the black students, appreciating the risks, had to choose between what was a deteriorating situation and a better future. Thus Steve Biko, the leader of the Black Consciousness Movement (a movement which started among university students and spread to different communities and high school learners), wrote:

*Now the response of the students [to the government crackdown in 1977] then was in terms of their pride. They were not prepared to be calmed down even at the point of a gun. And hence, what happened ...<sup>1</sup>*

3. *The student must therefore interrogate the power relations in his/her community while he/she has the time, the leisure and energy to do so.* This is when the question of student leadership arises, not by virtue of enjoying the privilege of higher education or being of a particular age cohort. At a time when students at black universities in South Africa, from black communities with apartheid-created problems realised the artificiality of the way the country was organised and reorganised to fight the white supremacist ethos, they stepped up to lead. Biko wrote:

*[S]tudents have seen their role as being primarily to prepare themselves for leadership roles in various facets of the black community.<sup>2</sup>*

To all intents and purposes the history of student activism in South Africa is tied into the history of apartheid and the activity of either defending or opposing apartheid. One of the unintended consequences of apartheid was the fact that it

led to the founding of student and other non-governmental organisations that arguably would not have come into being had it not been for provocation by the apartheid ideology and its practices. Let's investigate this expression of student leadership from our history in more detail.

## A LESSON FROM OUR OWN HISTORY

The creation of the South African Students' Organisation (SASO) in the early 1970s, a period during which the black students decided to view themselves either as part of the problem or part of the solution, was a direct consequence of the government disdain of black community interests. For instance, at black universities like the University of the North, Fort Hare, Zululand, Western Cape and Durban-Westville, the arrangement was that whites would lead and the communities for whom the universities were ostensibly established would serve only in advisory positions. What one found was that at formal events at these universities, whites, whose children were not even students at these institutions, would be on the stage whereas the black parents would be in the audience watching how whites were leading. These glaring racist overtones of higher education compelled students to seek disengagement from the then mainly English but multi-racial National Union of South African Students (NUSAS), which allowed them a critical distance in order to interrogate the power relations of the time.

In the period when white supremacy was in vogue, white students could not have as much reason as the black students did to agitate and develop leadership to fight for a better future. The present was pleasant enough. Yet, in the days before apartheid, when the English kept the Afrikaners downtrodden, Afrikaans students had reason to mobilise for unity and resist what was being done to them. This saw the establishment of the Rapportryers, and, in a sense, the youth wing of the Ossewa Brandwag.

The reactions to both English rule as well as to apartheid domination took the form of outbursts against the systems that were bent on subjugating others. Even the student riots in Soweto in June 1976 were more spontaneous than they were organised, contrary to many claims. John Kane-Berman who wrote the first book on the Soweto uprisings recorded:

*On the morning of Wednesday 16 June 1976, twenty thousand Soweto schoolchildren marched to protest against a decree by the South African government's Department of Bantu Education – that Afrikaans had to be used as one of the languages of instruction in (black) secondary schools.*

1 Aldred Stubbs, Interview with Steve Biko, p. 1-5, quoted by Arnold, Millard W. 1987. *No Fears Expressed*, Skotaville, Braamfontein.

2 Ibid. p. 145.

*It is not altogether clear what happened to the initially peaceful march or what sparked-off the violence that was to claim at least 176 lives within less than a week.<sup>3</sup>*

The culmination of the Black Consciousness Movement, the Black People's Convention and the general discontent among school and university-going populations in the country led to more high-handedness by an increasingly besieged political system. With the murder of the most proponent of revolutionary change inside the country, Steve Bantu Biko in Pretoria on 12 September 1977, more voices were added to the resistance. At that point a growing number of white student formations began to sympathise with the black youth, black churches and non-governmental organisations that were agitating for change and non-racialism.

Resistance to apartheid consequently gradually began to spread to white progressive quarters. Student leaders and university intellectuals such as Neil Aggett were perceived as dangerous in the white communities for their embracing of equality and non-racialism. In the early 1980s the University of the Western Cape (UWC), which was intended to be better than black-white universities and worse than white universities, took the lead in what came to be seen as the black intellectual left in the country. More and more coloured students and staff embraced the Biko-notion of blackness to include all the oppressed masses in the country. The students at UWC at the time became more radical than the system had hoped, and this affected the politics of black student and staff profoundly. The student leadership that emerged from this era, under the spiritual guidance of Allan Boesak and the intellectual guidance of Jakes Gerwel radicalised campuses to adopt the slogans such as "no normal education in an abnormal society" and "liberation first, education later".

Further, students were united by their growing identification of the common enemy, apartheid, and the concomitant reaction of the government to what were actually legitimate expressions of a normal student population, raising questions about their communities and their future in such communities.

## CHALLENGES AHEAD

Like most countries also South Africa, faces significant challenges, and student leaders can make an important contribution to address these challenges. I take the liberty of naming a few:

1. *Civil society needs to emigrate from the old South Africa to present day South Africa.* The act of emigration is accompanied by an attitude of openness and a willingness to start anew. This attitude will enable civil society to reconstitute itself with a new vision and strategy based on the dynamics inherent in state-society relationships. This is important because most civil society formations are still fossilised in the issues of apartheid and continue to use anti-apartheid idioms.

2. *The relationships between university, civil society and other societal role players need to be reinterpreted.* Incumbent on civil society is the search for synergistic and organic relationships between the hitherto fragmented and adversarial sectors of society. However, an essential part of this relationship must be constructive disagreement. A search for a value-added relationship with a built-in commitment to give and take and complementarity ought to start in earnest, as this will strengthen the state-society relationship and accord it a dialogical purpose and an organic meaning.

3. *An objective and critical stance needs to be maintained.* A search for constructive engagement should not be at the expense of adopting a position relative to and critical of the government of the day. Not everything that government does is negative. Hence, credit is due.

4. A further challenge will be that of *networking with other non-governmental organisations (NGOs)* that are doing compatible work in order to be effective and avoid duplication of services. Escalating violence and crime in South Africa constitute but one area in which there is a need for effective and intersectoral networking. In this context another critical challenge is that of solidarity with non-South African NGOs, particularly those in the southern African region. Much of the crime menace has its tentacles beyond South Africa's borders. Since crime syndicates operate across borders, mechanisms to combat crime should be developed at interprovincial and international levels.

5. *The most important challenge, however, is the creation of a value system around which civil society can organise itself.* This system must be undergirded by a set of fundamentals such as sharing compassion, empathy and sympathy, service and the desire to empower others to help themselves. This is in essence what is called for when government and civil society alike invoke ubuntu – that life becomes more meaningful in relation to and with others, amplified in campaigns such as the Masakhane ("Let us build one another") campaign. Such

<sup>3</sup> John Kane-Berman. 1978. *Soweto: Black Revolt White Reaction*. Ravan Press, p. 1.

a value system is a prerequisite for the establishment of a social order where a spirit of altruism and philanthropy is self-evident. Whereas previously the main tasks of the organs of civil society were to deal with the ills of apartheid, a return to dealing with the vicissitudes of life in general is required.

## FINAL THOUGHTS

The university student in today's South Africa is a different person from the students of the 1960s, 1970s, 1980s, and even the 1990s. Their central preoccupations were to think about life after the dreaded apartheid system for black students, and how to hold onto privileges safely, in the case of white South Africans. The black and the white student today do not and cannot see apartheid as the main reality. *The reality in student life today is a better future for all.*

In the process, race begins to play a diminishing role. In the main, class differentiation takes on a non-racial complexion so that most of the students dream less of being a political leader and more of being a successful man and woman in business and whatever domain they may excel in. Thus relations are being formed around different issues and different role models are being identified for them to emulate.

The renowned Nigerian novelist, Chinua Achebe warned of his native country Nigeria: "The trouble with Nigeria is simply and squarely a failure of leadership ..."<sup>4</sup> This warning is apt for South Africa and any African country for that matter. This is indeed a clarion call for the student leadership in South Africa who cannot continue to fashion themselves along the models of Mandela, or Sisulu, or Tambo or even De La Rey.

It is the university students who should be reminders of the values that initially fuelled the liberation struggle – compassion, empathy with the weak and vulnerable and the poor, sacrifice, humility, service, and ubuntu. It is they who can serve as moral compasses to the nation. It is they who ought to be asking affirmatively disruptive questions about and pursuing appreciative enquiry into the foundations of their future. It is they who possess the energy, the agility, the inquisitiveness, the imagination, the foolishness to be the child who noticed and could say that the emperor was naked. It is they with the dreams, who can defy, sing the songs of freedom and unity; it is they who can dream the big dreams. It is they to whom the future belongs!

<sup>4</sup> Chinua Achebe, *The Trouble with Nigeria*, Heinemann, Oxford, 1984, p. 1.

# Understanding our globalised world



***Jack Welch, previously the manager of the very successful and internationally powerful General Electric said the following: “If the pace of change inside your organisation does not keep up with the pace of change outside, then you are heading for trouble”. With that he expressed a point of view which has become very common on the business world or corporate sector: Change is the only invariable!***

You realise how strong the emphasis on change in the business world is when, as an academic, you are continuously involved with the executive directors and senior managers of large companies. And what applies to large companies is especially applicable to smaller companies. *If you can't lead and manage change, you will either be swallowed or spat out along the way.* There is a huge difference between your professorial office and boardroom of the directors; the classroom and your work area as employee of a business institution.

The business world can be described in many ways. Whether it's big or small, every business enterprise is an organisation or institution where products, processes and people play a decisive role in success. Jack Welch does say that, after everything has been said about business enterprises, there is no institution where the success is so directly dependent on change and innovation and people's ability to adapt to it, as in the case with business institutions. It's a world where you must be able to think and do strategically if you want to be an entrepreneur and not just an employee. The reason for this is simple, but very challenging: You must be able to compete. Competitiveness and the ability to add value through innovation is the key to success. And competitiveness is different than having a degree qualification!

Dr Anton Rupert, undoubtedly one of the biggest entrepreneurs that South Africa has ever produced, and who started his big international business enterprise with a mere £10, always said: An entrepreneur is someone who thinks ahead; who is ahead of other people; who starts something new with his ideas. If you get behind, you stay behind.

*Today companies and business organisations are the big and true generators of change.* If it is so – as is generally accepted today – that knowledge and service workers, and not just financial capital, determine the wealth of a country, then one of the most important partnerships which exist today is the one between the business sector and the university and other research and training centres.

There is even a tendency to do more and more research and postgraduate training outside the university. General Electric is a good example. Today it is indeed the business sector that applies knowledge on a large scale, applications that drive our world and its changes.

## PROCESSES WHICH DETERMINE OUR WORLD

There are a few processes which directly determine the story of our world. Sometimes people refer to these processes as tendencies, powers that are let loose and must be managed and led by people – for example environmental erosion, global warming or even the occurrence of HIV/Aids.

Some of these processes and tendencies are indicated as *mega processes*, meaning that they are processes that, in terms of volume, duration and energy will not disappear soon. Over a period of thirty or fifty years they will have a significant influence on the corporate world. One such a process is the global warming issue, which will be discussed later in this chapter.

Other processes and tendencies are called *macro processes*. They don't have the same voluminous and vital scale as mega processes, but are of vital importance because they stretch over country borders, are long term processes and concern a large number of people. These processes, which we are not going to discuss, are relevant to the role of the government. Whatever we do, we'll never get rid of the government. The government, and the way it acts in the world, concern our comings and goings very closely – especially the comings and goings of the corporate sector. You cannot tackle good business projects in a weak, negative or restricting policy environment. The nature of the government's policy can make or break the business sector.

The mega process that I want to discuss is called globalisation. It is a very powerful process which touches everyone, young and old, rich and poor.

## THE IMPACT OF GLOBALISATION

For many years globalisation has mainly been described in economic terms. Many authors reckon that globalisation is the integration of national economies by means of for example direct foreign investments by the multinational companies, network or commercial relations, the flow of short term capital over international borders, the flow of technology, the flow of managers, employers and even "guest workers" to other countries and the access to worldwide training opportunities.

It is true that the economy and the free market are important factors in globalisation. They are not the only factors, as can be seen by the worldwide resistance by numerous activist groups against globalisation in all its forms. Today globalisation is seen as a comprehensive, worldwide process of integration and transformation which for example also concerns people's culture and value

systems. There has also been referred to globalisation of information as the "internationalising" of selected languages and communication systems. The well-known Rijk's University in Utrecht, the Netherlands, like many other "national" universities" decided a few years ago to "internationalise". This didn't only bring about a strong focus on international needs, but also increasingly made the student composition of the university and its lecturing and publication language more diverse.

There are a few facets of globalisation that deserve emphasis. The *first* is that the market for knowledgeable people and competent leaders are now open. Restrictions on migration of experts and people who can compete have vanished. One of the reasons why Dutch, Danish, British and other foreigners are beginning to flock to some South African business schools, is not only because of the excellent training at a low cost, but also because they want to experience the diversity of the South African world. They argue that one day they will work in a diverse environment, along with people of many languages, cultures and religious convictions. Where better to acquire knowledge and experience of this than in South Africa?

This open, globalised market requires people with the expertise, ability and temperament to enter this market. The inability of some graduates, especially those who don't have good communication and interpersonal skills, as well as the capacity to adapt, has already led to the fact that developed countries talk of a loser generation.

The *second* facet is that national and cultural borders have become "soft" or even disappeared. We increasingly find ourselves in an interdependent, web-like world where vibrations at one point in the web is widely felt and experienced. Accelerated technological development, especially with regard to access to and distribution of information, is the most important reason for this. It will accelerate forward. The fact is: Digital information knows no boundaries. How the obliteration of borders with the tendency and right to cultural, religious and other forms of specified identifications must be balanced, is one of the big challenges that we face, especially in our own, very diverse country.

The *third* facet which must be mentioned is the appearance of the networking businessman, politician, academic, et cetera. A globalised world is a networking world. In the past people might have said: "Our power is in our isolation", but today they say "Your place in the network determines your power". It has already led to what today is called the businessman in transit; the travelling businessman; the businessman whose office is a private plane.

At the University of Harvard there are referred to the boundaryless firm. Naturally the boundaryless firm need people who can look after and manage the main office, the home base, the head office or the “group address”. They form the necessary office staff, the operational managers, and the people who receive and carry out the orders. The networkers are of another order. They determine policy and strategy; give direction; discover and develop opportunities.

It is inevitable that in a globalised world the competition between networkers and strategists on the one hand, and operational managers and office staff on the other hand is extremely fierce. Not everybody will be and are networkers. The differentiation between leadership and management is already busy growing. The previous century was the century of the “managerial revolution” (Galbraith). This century is the century of the leadership revolution, in other words, the focus is on leadership and the development of leadership.

A *fourth* facet of globalisation is becoming more and more important: the emphasis on sustainable development. Today this term is central in vocabulary of leading people and important opinion shapers. Simply put, it means that the decisions and actions of today must ensure that the world still exists tomorrow, and that hopefully it's one that is better than ours. The choice for sustainable development is a very important choice. It requires a good balance between short term and long term goals. To put it more pertinently: It requires you to temper your inclination to make your decisions on the basis of short term benefits, by weighing it up against the long term benefits. And also weigh up long term benefits if there is another option in your choice.

It's not easy. You should discipline yourself to think in terms of long term goals. That is something that Dr. Anton Rupert was very good at. Like Henry Ford he kept on living in the house that he had bought as young entrepreneur. He always said: “I have no desire to live in a new house. I have only one desire: to build an establishment [Rembrandt] that will hold it's own longer after my death”. Henry Ford did the same.

A *fifth* facet of the globalised world in which we must find our way and plan our future, is related to something which is of increasing concern to people: the birth of an institutionalised power. That means the concentration of power and the ability to influence the course of matter, being established within institutions that are growing and becoming stronger. It is also called multilateral organisations.

In a networking world, with its focus on sustainable development, the big question is therefore how internal policy can be synchronised with international policies and tendencies, and especially how the possible conflicting interests must be managed. It makes heavy demands on new entrants to especially the

professional market, the entrepreneurs' class and the high-level management corps. They will need the training and ability to understand the networking world, as well as the social and political processes that play a role in it, and be able to play them in. That is why many companies are already busy with intense policy analysis in the light of questions like: “How does official policy affect the company's activities?” and “How can official policy be influenced positively?”.

National governments like South Africa will always stay important and will not disappear. But their ability to follow their own route has already disappeared. This route is usually just downhill, as in the case with Zimbabwe. Financial multilateral organisations have a lot of influence. That includes organisations like the World Bank and the International Monetary Fund. The World Trade Organisation is another very influential organisation. Among other things it has a big influence on the future of agriculture in Africa, as well as South Africa. There are also organisations like the G8 countries. It consists of countries with a high level of industrial and economic development.

It is due to this state of affairs that national establishments, like universities, and national business organisations are forced to combine forces in order to better look after their own interests. Cooperation, or partnerships, as it is increasingly called, is what it's about.

We especially see it in the business world. Joint projects on macro level, with their sights set on competing internationally by sharing expertise skills, have become unavoidable. Financing of mega or macro projects by international financial institutions require bargaining power and combined expertise and intelligence from those companies who want to be first in line. The cooperation of for example Murray & Roberts within a consortium which also includes foreign expertise in order to handle the Gautrein project is an example of this. By the way, project managers who lead and manage mega and macro projects, are definitely popular and scarce positions in the globalised world.

The growing institutional force of international organisations and the focus on globalised networks have also cost the universities something. For example, one university cannot now be everything for everyone by providing in all training needs. Neither can it compete with nearby universities in everything. Cooperation and partnerships, even to the point where division of work must be negotiated, is a growing tendency. This tendency already finds expression in the conviction that qualifications should not only be obtained at one university, but the exchange of courses help to better prepare people for a world of diversity.

Global rules and policy on global issues like trade, health, safety, environment, combating poverty and job creation has come into being. It has already had an effect on business enterprises and institutions like universities.

This effect will become more visible as universities can no longer rely on financing from the government.

## HOW DOES THIS AFFECT YOU?

Since it still remains the biggest job provider to graduates and trained people, I will limit my answer to the *business sector*. Some of the principles that are applicable here, is however also applicable to other sectors.

Within this sector the need for knowledge and service workers will grow, as well as the need for entrepreneurs and project managers. In terms of the latter South Africa is still in its infancy.

Many graduates don't make the grade in the business sector because their preparation was ineffectual or their expectations were too high. The most disillusioning experience that I have come across in my involvement in the business sector, came from the executive head of a company who at that stage had approximately 45 000 employees in his service. He placed a very large premium on university training. But, his damning opinion was the following: "I have to retrain graduates in order for them to understand what a business enterprise is about, how knowledge must be applied, how to manage people, processes and projects, and what the word 'strategy' means". He even went further: "It is impossible to change some graduates. They are prisoners of their professors' handbooks".

This view is exaggerated, but it makes an important point: How to apply acquired knowledge in a business organisation, or even to throw it to one side in light of new insights and strategic challenges. The business sector is ruthless if you cannot throw a bridge between theory and practice. That is one of the reasons why in South Africa there exists a tension between business people and academics.

A good understanding of the pressures and workings of the business sector is an important requirement for a successful entrance. In fact, globalisation even makes it urgently necessary. As in the case of the South African managing director of a successful financial institution, who quickly had to learn to find his way through the complexities of the international financial world, often flew to London for the weekend to conduct negotiations, has to maintain a network, get the best information and understand what the latest tendencies and products in the financial market are. Meanwhile he has to manage his company and ensure that he gets good research on his desk! Interestingly enough, early on in his life this person chose wide exposure – not only with regard to studies,

but also experience (in Europe). His goal was very specific: "I want to get to know everything about how financial institutions operate. At the age of thirty two I want to manage a financial institution."

Strategic thinking, continued training and education, planning of goals and an excellent network are some of his success factors. He makes no secret of the fact that his training was his launch pad.

In a globalised world you quickly have to find an answer to the question as to whether you want to be part of the corporate leadership and management corps, or just a committed employee. The days where you progress on the ladder with years of committed and faithful service are over. As John Collins said in his book *Good to Great*: "It is not good enough to be good. Being good is actually the enemy of being great".<sup>5</sup>

In South Africa globalisation will also separate the wheat from the chaff. Progress, and promotion, is no longer guaranteed, whether you have a degree or not. It is about whether you can make a contribution in the building of an establishment that promotes sustainable development. If you cannot do that, you and your degree will be declared "redundant". It makes heavy demands. In a globalised world the business sector doesn't allow for failures. It can no longer be afforded.

In the future the demand will become even higher and heavier. Training, experience, temperament and strategic abilities will determine the winners.

<sup>5</sup> John Collins. 2001. *Good to great*. New York: Random House.

# SOME IDEAS ON HOW TO FACE THE CHALLENGES

## 7 Questions to Wendy Luhabe

### 1. Do you think a university degree is a necessity for a successful career?

For professional careers like accounting, law, medicine, engineering and many others a university degree is obviously necessary, but I am not convinced that it is necessary for a successful career. Education gives us the keys to build a career. *Whether our career becomes successful depends on the opportunities we create for our development and confidence, as well as on those opportunities that we identify that would be suitable in advancing our career.* I have also come across many people with qualifications that they could not put to good use because they had a chicken mentality. A chicken mentality always underestimates our abilities and overestimates the odds stacked against us. It is not true that everything is predetermined by circumstances and background.

Secondly, university education is helpful only to the extent that it develops critical thinking skills, instils discipline and the culture of performance, and develops young people to take responsibility for their lives, to have the tools to live effectively and to be able to relate to others meaningfully.

For South Africa's socio-economic challenges, we should be encouraging a lot more vocational training to ensure that young people who cannot afford university education are not marginalised. Ultimately, for South Africa to

become an economic giant, we must foster entrepreneurship and innovation in our entire education offering. The corporate environment is often stifling for many young people; we should therefore offer an education that gives them many career options, whether it is from a university, technicon or college.

### 2. What would you have done differently during your time at varsity?

I initially studied Social Sciences because that was what black women studied in the 70's, but by some stroke of luck, due to the Soweto education uprising I decided to change universities from Fort Hare to Lesotho where I changed my field of study to Commerce. My choice was more an accident than a well-considered one. If Lesotho offered Social Sciences I would have continued in that direction. If I had to choose again, I would choose a business science degree, perhaps because I think the economy underpins the effective development of any society, provided our value system responds to inherent challenges. According to Lou Holtz, ability is what we are capable of doing. Motivation determines what we do, what actions we take. Attitude determines how well we do. This for me is the secret of success, not that we have qualifications but that we can ensure that our attitude towards our life, our work and our contribution always reflects our highest values and standards of excellence we can be proud of.

### 3. What do you consider as the biggest challenge for today's young graduates?

They have so many choices that I can imagine it must be difficult to decide what to do and to invest enough time to build experience in just one field before moving on to the next. In the 80's when I started working, we had to keep a job for at least five years, in order to be able to have enough depth of experience for further career opportunities. This challenge of many choices leads to a range of unintended consequences like impatience, lack of resilience, a poor foundation, and lack of proper experience to make informed decisions. These consequences ultimately make young people restless, unfulfilled and unable to make a meaningful contribution. To be successful in life we need to be focused, invest our effort and witness divine intervention collaborate with our vision, our intentions for our lives and our aspirations for our potential.

#### **4. How big is the gap between the theory of the textbooks and the real world?**

The gap seems to be big; I don't believe text books are being updated to keep up with the pace of change and complexity around us. To respond to this gap, academic staff should interact with the world of work regularly to understand what the challenges are for young people in order to make education relevant and exciting. They should invite working professionals and executives to interact with students on a regular basis. Students should be required to read recent books available on management issues, leadership issues and other areas that will assist to prepare young people effectively for the world of work. The focus of education in the 21<sup>st</sup> century should be to develop thinking skills, social skills, life skills, emotional intelligence and spiritual intelligence. None of the existing text books were written to fulfil these needs.

#### **5. Is it really true that “it is more important who you know, than what you know”?**

Regrettably, that seems to be how the corporate workplace operates, people advance based on their network rather than on their knowledge and experience. So people who do not know how to play corporate politics get marginalised and ultimately become frustrated, resorting to being disengaged or leaving with the hope of finding greener pastures somewhere else. Corporations destroy many aspirations, reinforce self-doubt and because they do not create an environment conducive to learning, knowledge is undervalued. At any given time, they tap into only 10% of their workforce; the rest are passengers. This of course is a reflection on the quality of corporate leadership that is found in companies today. Corporations that consistently do well are those who create an environment where all employees are valued, their aspirations nurtured and their inadequacies turned into assets.

#### **6. What do you think of South Africa's university system?**

We have good universities in South Africa; we must simply keep raising our standards, adapt to changing circumstances and prepare young people for a world that will only emerge ten years after they complete their education to keep them ahead of the game. We must regard young people as equal partners in the education process to keep our academic approach dynamic and relevant.

We must explore diverse ways of learning like study tours to other parts of the world that have excelled in a particular field of study to broaden student experience. We must create regular debates to allow students to exchange their views, to improve their communication skills and to develop a tolerance for views and belief systems that differ from their own. The problem is that we continue to educate young people for a single-minded world view; the reality of course is that we live in a multiple-minded world view. This is why there is a huge lack of trust and mutual respect in the world.

#### **7. How should I plan my future?**

I personally do not work with ten year plans, I like operating on an open canvass, remaining open to new opportunities. What I do however do is to generate ideas of the things I want to do, and germinate them until they are ready to sprout. Others and many books that have been written seem to advocate for plans but ultimately it depends on the individual. I am quite comfortable with uncertainty, most people are not. We are brought up and educated to function in an environment of certainty but we see that increasingly we spend our adult lives in a world of uncertainty. I think that plans limit our prospects to the moment that we put our plans on paper, leaving no room to adventure, expansion and possibility. We must find a strategy that works best for us, as long as we keep moving forward we are making progress. We should aim to fly; if we can't fly we can run; if we can't run we can walk. If we can't walk we can crawl. The secret is to keep moving forward and towards our dreams.

# WHY YOUR WORLD NEEDS YOU



***During the past two decades South Africa has made one of the most remarkable political transformations in world history. We have progressed from a country isolated due to the apartheid policy, to a “rainbow nation” that symbolises new hope for countries in transition. Nelson Mandela and FW de Klerk were both honoured for this with the Nobel Peace Prize. Since then South Africa is “managing” a silent revolution towards a more inclusive political, economic and social order and we have warded off an open revolution and a possible blood bath. At the same time, however, different sides of the political spectrum had high expectations for the new South Africa – expectations that couldn’t all be realised.***

South Africa’s challenges in the above mentioned areas make you think of the standing phrase: “It is the best of times; it is the worst of times”.<sup>6</sup> In certain respects the country has made excellent progress on political, economic and social levels and is held up as an example for other developing countries in transition phases. In other respects we haven’t done so well as the challenges for the future are so much bigger.

Before the future challenges in the different areas can be discussed, it is important to state two further points of view. Firstly South Africa is part of a fast-changing and globalising world and the country cannot escape these challenges and opportunities. Secondly South Africa is also part of the African continent and therefore inseparably integrated with the continent and its problems and challenges.

## **SOUTH AFRICA AND A GLOBALISED WORLD**

The past two decades have produced some of the most far-reaching changes in world history. On political, economic, social, technological and environmental levels some spectacular changes have taken place.

A synoptic view of the changes shows that *democracy quickly spread across the world, but received mixed results*. Not all countries fared so well in establishing a democratic culture. The expansion of the market economy also didn’t go equally well in all countries and parts of the world. And the “Tigers of

6 The expression was adapted from Charles Dickens’ “It was the best of times, it was the worst of times”, the opening paragraph of his *A tale of two cities* that appeared in 1859.

the East” fared better than the East Block countries.<sup>7</sup> Despite the fact that the South Eastern Asiatic countries made a lot of progress with poverty relief, *the gap between the rich and the poor world level is bigger than ever*. It holds in a huge threat for world peace.

The “war on terror” and that which preceded it, also created *the danger of division along religious “fractional lines”*. It makes the world potentially more dangerous than before. *Increasing environmental damage* have suddenly become a bigger reality and set some of the biggest challenges in the coming decades.

The new economy with its new game rules has created an exciting but more uncertain world with fast trade traffic via the internet. Markets are more unstable and unpredictable and leave countries and enterprises in a more fragile state.

*South Africa is therefore part of a fast globalising world*. Due to the development of information communication technology countries across the world have more direct contact than ever before and the world economy have become a lot more integrated. Events elsewhere in the world therefore have a more direct effect on South Africa, as we have experienced in recent years. Economic policy-making no longer takes place in isolation from the main stream and countries are keenly watched by the institutions responsible for identifying countries’ credit judging and order. The development of a country like South Africa is no longer just domestic, but is dependent on, and sometimes at the mercy of international politics and economic powers.

*The biggest challenge for countries like South Africa is to position themselves within the above as well as other world changes*. South Africa is currently in the process of restructuring the economy in order to adapt to these challenges on international level. The biggest challenge is to use the benefits of globalisation, but also to manage development on national and local level (in other words in townships and towns) in order to create sustainable life possibilities for people at the bottom of the income pyramid. The latter approach is internationally referred to as the base of pyramid approach (BoP).

The BoP approach is chiefly concerned with the developing of business opportunities in poor communities, to the benefit of both the big and small enterprises, and the creation of sustainable enterprises in poor communities. Together value is created by the development of low-cost quality products for poor communities (lower profit margins and higher sales volumes). Linked to this, work aimed at development is often undertaken in these communities.

<sup>7</sup> When referring to the “Tigers of the East”, it usually means Singapore, Hong Kong, Taiwan and South Korea. The former East Block countries refer to the Soviet Union and her allies in Central and Eastern Europe (Bulgaria, Czechoslovakia, Eastern Germany, Hungary, Poland and Romania).

## SOUTH AFRICA AND AFRICA

*South Africa has the strongest economy on the African continent* and is classified as a middle income developing country. South Africa therefore plays an important role as economic power on the continent and the South African business sector has already attained the role as biggest investor on the continent.

With the founding of the *New Partnership for Africa’s Development (NEPAD)* South Africa, via the prominent role of former president Thabo Mbeki, has played an important role in piloting a new initiative to position the continent within the new political and economic world order. Through it African countries admitted their past mistakes, but also admitted that globalisation is a reality. Despite criticism NEPAD has provided a new framework for sustainable development for the continent. The African peer review mechanism – by which African countries are measured according to certain criteria within the framework of the NEPAD goals of healthy democratic principles, government management, economic management (especially fiscal and monetary management) and social development – gave the first important step in the direction of acceptance of “healthy” African development by African leaders. Even South Africa received criticism based on the review.

South Africa also played an important role in the Blair commission on Africa’s development, and especially with regard to the issue of aid and the writing off of the debt of the poorest African countries with the most debt (the “highly indebted countries”).

*With regard to the promotion of peace on the continent, which is a core condition for sustainable development, South Africa also plays an important role*. Former president Mbeki in particular, but also his cabinet members played an important role in bringing about peace in the Ivory Coast and the Democratic Republic of the Congo (DRC), while South African troops are deployed in several African countries.

*But South Africa’s role in Africa is also controversial*. While the management, administrative, economic, military and other capacities that South Africa has is seen as a great asset to the continent, on the other hand South Africa is also seen as a threat to Africa’s development; especially due to the country’s economic power (South Africa produces close to 40% of the gross geographic product of Sub-Sahara Africa).<sup>8</sup> This dominance is especially embodied practically in the increase of business investments in the rest of Africa and the expansion of South African business interests to the rest of the continent.

<sup>8</sup> World Bank, 2004. *African Development Indicators*. Washington: World Bank.

Due to this expansion of business interests to the rest of the continent, owners of small enterprises in Africa have legitimate fears that South African enterprises will oust them. It could even be seen as a second form of colonialism if South African enterprises sent back the profits to South Africa while the host country benefits little from the provision of local expertise, labour and products. That is why the South African government has created a manifest on business conduct to give Africa the benefit of South African products, services and capacities and to prevent the continent from being “exploited”.

*Despite South Africa’s economic power on the continent the South African economy is still relatively small in comparison to the biggest powers, like the so-called G8 groups of countries.*<sup>9</sup> Moreover the South African economy is characterised with characteristics of developed as well as developing countries. The modern sector of the economy, especially found in cities, is strong and vital, while the less developed parts of the economy, found in the rural areas and on the peripheries of the cities, are underdeveloped and poor. The relatively small, but viable and dynamic developed sector is surrounded by a sea of poverty and unemployment. That is one of the most noticeable aspects of the “new” South Africa: that despite the longest period of economic growth (1999-2007) in the post-war period, the country still cannot wipe out poverty and unemployment. An economic dispensation where more people can share in the benefits of economic growth and development is one of the biggest future challenges for the leadership of South Africa.

## WHERE SHOULD SOUTH AFRICA GO FROM HERE?

*When we refer to the obligation toward the community, the country and the continent, we are in fact referring to the development of the country.* For economists the term development has taken on many dimensions over time. In the past development was measured by the increase in a country’s economic growth rate (in terms of growth of the gross national product of GNP); the increase in the income per capita; the meeting of people’s basic needs, like food, job opportunities, clothing, housing and others; and human development as measured against the so-called Human Development Index of the United Nations Development Programme or UNDP. The latter is a combined index of life expectancy at birth, education level and gross domestic product. With

this and other measuring instruments a lot of progress was made in measuring development in a more comprehensive, holistic way.

*The well-known development economist Amartya Sen argues in his book Development as freedom that development should be seen as the expansion of people’s freedom*<sup>10</sup>. For Sen it is important to focus on the final purpose of development, namely freedom instead of the means to the end, for example growth in GNP or income per capita. Although the latter is very important in itself, it’s not a sufficient condition for development. Development as freedom presupposes that the cause of the lack of freedom must be removed. The latter includes poverty, tyranny, poor economic opportunities, social deprivation, a lack of public facilities and intolerance or the over-activity of an oppressing government.

According to Sen the absence of freedom is directly related to the occurrence of poverty, inadequate nutrition, medication to fight diseases, opportunities to obtain clothing or having clean drinking water and sanitation. These basic needs to a large extent determine the basis without which meaningful development will struggle to take place.

Sen distinguishes between five types of freedom: political freedom, economic facilities, social opportunities, transparency guarantees and protective security. These freedoms complement and strengthen each other. From this we can deduce that development of a community, country and continent is multi-faceted and complex and that there aren’t simple recipes to bring about development. As you will later see, it creates big challenges for leaders in all domains.

Measured against the above norms one can say that the current generation of young people will not be without challenges and opportunities in the South African and African context. We have an opportunity in South Africa to make new history. That is unlike the developed world where authors claim the end of history is in sight!

<sup>9</sup> The G8 (or Group of 8) consists of Britain, Germany, France, Italy, Japan, Canada and the USA.

<sup>10</sup> Sen, A. 2000. *Development as freedom*. London: Oxford University Press.

## HOW ARE WE DOING AND WHAT ARE THE CHALLENGES?

For the purpose of this discussion we will focus on four key elements of development, namely the progress of political democracy, economic development, the social order and the standing of the condition of the natural environment.

### **The progress of political democracy**

As mentioned in the introduction South Africa has made remarkable progress with regard to political democracy since the process started in 1990. Since 1994 there is relative peace in South Africa and it looks as if the governing party wants to maintain it.

South Africa has accepted a *liberal constitution* which provides for a *constitutional court* and a *human rights culture*. This constitution has received worldwide praise and the constitutional court has already proved itself as a guardian of the constitution. Minority groups are not oppressed and are consulted by the authorities on a regular basis, although there are signs of excessive concentration of power in the hands of the ruling ANC alliance. Although from time to time there is discontent among the trade unions about rendering of service on the local level, as we experienced in 2007, large scale political unrest hadn't really cropped up.

With regard to *transparency*, one of Sen's requirements for freedom, the country has progressed well in comparison with the previous political dispensation. However, there are still islands of in-transparency. The actions, or lack of action, of parliament against members of parliament who have infringed regulations, are one of the more controversial aspects of the new dispensation.

Another sensitive barometer for political democracy is the *obliteration of racism and the promotion of reconciliation*. With the removal of apartheid, South Africa has in general, and at least legally, moved away from racial discrimination. The application, however, does show certain deficiencies. The fact that the population is still classified in terms of black, white, Coloured and Indian, is not conducive to the abolishment of racial discrimination. Paradoxically the promotion of broad-based black economic empowerment (BBBEE) and employment equity (EE) has created the potential for new forms of discrimination based on race. BBBEE has so far also not really succeeded in truly creating broad-based empowerment, and the widespread charge

against it is that only a small group of people are (continuously) benefited by it. Employment equity has proven not to be equitable to black people and among others has led to an exodus of expertise from the country.

Reconciliation in South Africa has made good progress under Nelson Mandela (more formally) and Desmond Tutu (civil society, more informally). Especially Tutu's concept of a rainbow nation was met with general approval and has laid the table for a process of reconciliation. The Truth and Reconciliation Commission (TRC) was the next important step in bringing transgressions of the past to the light and bringing about reconciliation. Due to several reasons, which fall outside the framework of this discussion, the TRC hadn't completely succeeded in bringing about true reconciliation. Like somebody once said: We have just pasted Band Aids on the wounds of the past. Reconciliation for the sake of peace, development and progress must still remain high on the agenda.

*From the above discussion you can conclude that the establishment of democracy in South Africa has gone relatively well, but that democracy can still be further deepened and expanded.* On the one hand it means that we must still learn more about the functioning of a full-fledged democracy and must learn more tolerance for a variety of view points and criticism. On the other hand it means that the authorities must reach out a lot more to the minority groups in the civil society in order to make them feel like a culturally safe part of the new South Africa. The big emphasis in the future will fall on service and participation in and leadership from the civil society in local development if South Africans want to narrow the gap between rich and poor and between racial groups.

### **Economic development**

*The new government in South Africa surprised everyone by putting forth a relatively conservative liberal economic policy after 1994.* By attaining a surplus on the national budget by 2007 as well as better management of inflation (in other words, stricter control over fiscal and monetary policy) and an increase in competitiveness, the government and the Reserve Bank (the central bank of South Africa) have created an environment for a higher economic growth rate in the long term. While South Africa experienced a long term decrease over a period of twenty years, the growth rate has increased after 1994 and the prospects are that in the future it will grow constantly at 5% or more. If South Africa wants to achieve the Millennium Development Goal of the United Nations Development Programme (UNDP), namely halving unemployment by 2014, the economy will have to show positive growth of 6% and more per

annum – a goal that won't be easily attainable at the current savings rate, the level of foreign fixed investments, the shortage on the current account of the balance of payment and the shortage of trained people.<sup>11</sup>

Since 1994 the government has piloted several initiatives to promote development. That includes the Reconstruction and Development Programme (RDP), Gear (Growth Employment and Redistribution Programme), Asgisa (Accelerated Shared Growth Initiative for South Africa), and more recently the developmental state. During the past two years the government has also launched public works and infrastructure development programmes to encourage job creation in the historically disadvantaged areas. In addition to that there are also spatial development programmes, local economic development plans (LED) and integrated local development plans that have been launched. Big assignments from the central budget have also been channelled to the poorer parts of the population in an attempt to fight poverty.

The economic restructuring that has taken place since 1994, moving away from mining as one of the most important contributors to the economy and the restructuring of South Africa's industrial sector – even with criticism – has created an important platform for future competition and economic growth. The increase in the importance of the services and tourism sectors has followed the pattern of world tendencies in this regard.

However, the biggest deficiency of the economic development in the period after apartheid is that the increase in the economic growth rate, especially since 1994, couldn't drastically change deep structural poverty and unemployment. Although evidence of lower unemployment and poverty has come to the fore, the unemployment level is still unacceptably high and poverty is also alarmingly high. The division of assets between rich and poor still benefits the white owners' class and the relatively small, but growing, black economic elite. It doesn't create a basis for sustainable economic, social and environmental development on the long term.

## **Social development**

As the United Nations Development Programme indicates, there can be no doubt that the new political dispensation has shown great progress with regard to the lives of normal civilians.<sup>12</sup> That applies, despite some obvious shortages,

especially with regard to the delivering of social services like education, housing, health, personal security (meant in the broader sense) and social safety nets. However, the effect of the policies on poverty relief and income and asset inequality is not worth mentioning.

Evidence of this can be found in the Human Development Index (HDI) of South Africa which has weakened between 1995 and 2003 from 0,73 to 0,67. By 1994 50,5%<sup>13</sup> of the South African population have fallen below the national poverty level; it has since improved to 43,2% in 2006 (people under R 3000 per annum) (see Presidency, Mid-term Development Indicators Review), but is still unacceptably high. Unemployment has also, in both the broad definition (40,6% in 2001 to 37,3% in 2006) as well as the narrow definition (29,4% in 2001 to 25,5% in 2006) only shown moderate improvement. It is also important to note that unemployment is still the highest among black people (30,5%), as opposed to 4,5% among white people, 9,6% among Indians and 19,4% among Coloured people.<sup>14</sup> The important fact to take note of here is that in general there have been an improvement in unemployment, but that people with higher levels of education and skills benefited the most.

*Although the access to basic services has improved, as measured in the census of 2001, the Gini-quotient, which measures the degree of income inequality in the economy, is still unacceptably high.* The Gini-quotient has weakened from 0,665 in 1994 to 0,685 in 2006. It is positive that inequality between races has decreased from 53,2% in 1994 to 41,6% in 2006 (Presidency, Mid-term Development Indicators Review). But the inequality within races, as measured with the so-called Theil-index, has increased from 35% in 2004 to 41,6% in 2006. The latter gap between races can possibly be ascribed to the growth in the black middle class and black economic empowerment which has led to the increase in the gap between rich and poor in the black community. Although between 3 and 4 million have probably joined the middle class and have thus stimulated the consumer demand and economic growth, the inequality within the black community has increased.

The life expectancy of South Africans at birth has declined from 54,6 in 2001 to 50,0 in 2007. The latter decline can specifically be ascribed to the occurrence of HIV/Aids. Women in prenatal care with HIV/Aids has increased from 7,6% in 1994 to 29,10% in 2006 (Presidency, Mid-Term Development Indicators Review).

11 UNDP. 2003. "Millennium Development Goals: A compact among nations". *Human Development Report*. New York: Oxford University Press.

12 UNDP. 2003. "South Africa". *Human Development Report*. Oxford: Oxford University Press.

13 UNDP. 2003. "South Africa". *Human Development Report*. Oxford: Oxford University Press.

14 Business Report. *Cape Times*. 30 March 2007. Jobs grow in number and quality. Cape Town: Cape Times.

On the positive side, between 1994 and 2006 2,3 million houses have been built in poor communities in South Africa; access to water has increased from 61,7% of the population in 1994 to 84,7% in 2006; access to sanitation has increased from 50% in 1994 to 71% in 2006; and access to electricity has increased from 50,9% in 1995 to 73,7% in 2006.

Due to the above poverty, inequality and unemployment patterns the level of basic needs fulfilment of a considerable percentage of the South African population is still unsatisfactory. It can have serious consequences for political stability in the country. Add to this the constant high levels of violent crimes and there is reason to believe that the “second liberation” of South Africa and the true creation of a free nation (in other words development as freedom) are still far from complete.

### **Environmental sustainability**

*South Africa's third great challenge is environmental sustainability through a sustainable ecological basis for the development of the country.* The Strategic Framework for Sustainable Development drafted by the Department of Environmental Affairs and Tourism comes to the conclusion that South Africa's natural resource basis is under pressure and that ecosystems are facing degradation.<sup>15</sup> Policies of the past (under the previous government) were based on South Africa's dependence on mineable resources like coal, cheap electricity from coal and/or ineffective use of old capital stock in this regard. These and other policies have led to the degrading of soil, water pollution, the loss of biodiversity and the ineffective use of resources, which often affected the poor the most. The poor are dependent on natural resources and ecosystem services like productive sea areas, with enough fish to secure their survival. According to the DEAT report the poor pay in terms of air pollution, expensive water and the long distances they have to travel between their workplaces and shopping places.

The conclusion can be made that the borders have been reached. The strategy to create sustainable environmental development focuses on sustained economic growth of 6% through infrastructure creation, the development of human capacity, and social development. Socio-economic development can however not be accomplished if the degrading and obliteration of ecosystems and resources continue.

15 Department van Environmental Affairs and Tourism. 2006. People – Planet – Prosperity: A strategic framework for sustainable development in South Africa. Pretoria: DOT.

### **BECOME INVOLVED!**

What do the above challenges and opportunities mean for us as South Africans? *Firstly probably the most important is that it leaves the younger generation with a future full of opportunities!* The opportunities may be different from in the past, but it will definitely be exciting. In contrast to many of the grown economies, developing economies like that of South Africa definitely provide more opportunities. In fact, the general expectation is that the economic growth of developing economies will in the near future be higher than that of developed economies and will also provide bigger investment opportunities.

*Secondly, it is also clear that exceptional leadership will be required* in order to position South Africa as one of the foremost developing economies. Insight on South Africa within the world and the African context will be necessary to position South Africa and to develop the correct policies and strategies.

*Thirdly, it appears that the opportunities will stretch across a wide spectrum and be multi-dimensional and multi-disciplinary.* We are going to need scientists, academics, teachers, business people, farmers, doctors, nurses, engineers, architects, environmental experts, et cetera to make South Africa a competitive country, but also one that can handle some the most important problems.

Fourthly, new skills will be required in a fast-changing world: better flexibility, the ability to work in multi-cultural contexts, better language skills, excellent technological skills, innovation, creativity and the ability to work in teams on different continents, to name but a few.

*Finally, the future will place bigger demands on young people to achieve breakthroughs on political, economical, social, technological and environmental levels.* It will continuously provide exciting opportunities.

Therefore it is necessary to qualify yourself as well and relevantly as possible in order to make a contribution to achieve breakthroughs and use opportunities. For most young people it will mean that you won't only study once and then be finished. It will mean continuous, lifelong, self-learning.

It will also require that you get wide exposure in South Africa, on the African continent and in the world. There are a variety of organisations and societies at most South African universities that do important work in their community, as well as more broadly in Africa. Most universities have a community service leg that raise up local communities through a variety of activities. What is great is that these organisations usually make provision for a variety of talents; if for example you study law, you can offer your services to a legal aid clinic, or if your

passion is mathematics, you can help out at a local high school by giving extra classes in maths.

A variety of campus societies and committees are usually involved in the community. Residences also often have a variety of activities to help with the conservation of the environment, piloting educational projects in the community and even organising African tours to collect money for a specific purpose. Furthermore there is, for example, a *Habitat for Humanity* society on several campuses that offers students the opportunity to build houses along with previously disadvantaged communities in squatter camps and townships (or even in other countries). Other societies, like bird watching clubs or the *Extreme Ironing* club, may not make a direct contribution, but will provide opportunities for students to get to know their environment and society in creative ways.

It is necessary to understand your community before you can want to start to change it. Use your time at university to learn more about your area, country and continent and then use that knowledge to make a difference in the world around you. The biggest satisfaction for the individual is often located in attempting something or getting involved in something that is bigger than you. The challenges and opportunities are exciting!

